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ARTS, SCIENCES, &c.

On a l'air d'un livre

LE DICTIONNAIRE DE L'HISTOIRE

DE L'HISTOIRE DE FRANCE

TRADUIT DE L'ITALIEN

PAR M. L'ABBÉ DE L'ÉPIQUE

DE L'ACADEMIE DE L'INSTRUCTION PUBLIQUE

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## Dictionary of Arts, Sciences, &amp;c.

## K.

K  
||  
Kempferia.

**K**, the tenth letter, and seventh consonant, of our alphabet; being formed by the voice, by a guttural expression of the breadth through the mouth, together with a depression of the lower jaw and opening of the teeth.

Its sound is much the same with that of the hard *c*, or *qu*: and it is used, for the most part, only before *e*, *i*, and *n*, in the beginning of words; as *ken*, *kill*, *know*, &c. It used formerly to be always joined with *c* at the end of words, but is at present very properly omitted, at least in words derived from the Latin: thus, for *publick*, *musick*, &c. we say, *public*, *music*, &c. However, in monosyllables, it is still retained, as *jack*, *block*, *snock*, &c.

Though it is seldom used in words derived from the French, as being altogether wanting in that language, yet we meet with *risk*, *burlesk*, &c. in very good authors, instead of *risque*, *burlesque*; and indeed the former orthography is certainly most agreeable to the genius of the English language.

As a numeral, **K** denotes 250; and with a line over it, **K**, 250000.

**KEMPFERIA**, **GALANGAL**; a genus of the monogynia order, belonging to the monandria class of plants.

*Species*. 1. The galanga, or common galangal, hath tuberous, thick, oblong, fleshy roots; crowned with oval, close-fitting leaves, by pairs, four or five inches long, without footstalks; and between them close-fitting white flowers, with purple bottoms, growing singly. 2. The rotunda, or round zedoary, hath thick, fleshy, swelling, roundish, clustering roots, sending up spear-shaped leaves, six or eight inches long, near half as broad, on upright footstalks; and between them, immediately from the roots, rise whitish flowers, tinged with green, red, yellow, and purple, centres. Both these are perennial in root; but the leaves rise annually in spring, and decay in winter. They flower in summer: each flower is of one petal, tubulous below, but plain above, and divided into six parts; they continue three or four weeks in beauty, but are never succeeded by seeds in this country.

*Culture*. Both these plants must be potted in light rich mould, and always kept in the hot-house, giving in plenty of water in summer, but more sparingly in

winter. They are propagated by parting the roots Kalendar.  
spring, just before they begin to push forth new leaves.

*Uses*. The first species is cultivated with great care by the inhabitants of Siam for the sake of its root; the use of which, says Kempfer, is to remove obstructions of the hypochondria, to warm the stomach, disperse flatulencies, and to strengthen the bowels and the whole nervous system. The root was formerly used in this country in bitter infusions; but is now laid aside, on account of its flavour being disagreeable.

**KALENDAR**, a distribution of time, accommodated to the uses of life; or a table, or almanac, containing the order of days, weeks, months, seasons, &c. happening throughout the year. See **TIME**, **MONTH**, **YEAR**, &c.

It is called *kalendar*, from the word *kalenda*, anciently wrote in large characters at the head of each month. See **KALENDS**.

The days in kalendars were originally divided into *octoades*, or eights; but afterwards, in imitation of the Jews, into *hebdomades*, or sevens; which custom, Scaliger observes, was not introduced among the Romans till after the time of Theodosius.

There are divers kalendars, according to the different forms of the year, and distributions of time, established in different countries. Hence the Roman, the Jewish, the Persian, the Julian, the Gregorian, &c. kalendars.

The ancient Roman calendar is given by Ricciolus, Struvius, Danet, and others; by which we see the order and number of the Roman holidays and work-days.

The three Christian kalendars are given by Wolfius in his *Elements of Chronology*.

The Jewish calendar was fixed by rabbi Hillel about the year 360, from which time the days of their year may be reduced to those of the Julian calendar.

The *Roman KALENDAR*, owed its origin to Romulus; but it has undergone various reformations since his time. That legislator distributed time into several periods, for the use of the people under his command: but as he was much better versed in matters of war than of astronomy, he only divided the year into ten months, making it begin in the spring, on the first of March; imagining the sun made his course

Kalendar. thro' all the seasons in 304 days.

Romulus's kalendar was reformed by Numa, who added two months more, January and February; placing them before March: so that his year consisted of 355 days, and began on the first of January. He chose, however, in imitation of the Greeks, to make an intercalation of 45 days, which he divided into two parts; intercalating a month of 22 days at the end of each two years; and at the end of each two years more, another of 23 days; which month, thus interposed, he called *Marcedonius*, or the intercalary February.

But these intercalations being ill observed by the pontiffs, to whom Numa committed the care of them, occasioned great disorders in the constitution of the year; which Cæsar, as sovereign pontiff, endeavoured to remedy. To this end, he made choice of Sosigenes, a celebrated astronomer of those times; who found, that the dispensation of time in the kalendar could never be settled on any sure footing, without having regard to the annual course of the sun. Accordingly, as the sun's yearly course is performed in 365 days six hours, he reduced the year to the same number of days: the years of this correction of the kalendar was a year of confusion; they being obliged, in order to swallow up the 65 five days that had been imprudently added, and which occasioned the confusion, to add two months besides the *Marcedonius*, which chanced to fall out that year; so that this year consisted of 15 months, or 445 days. This reformation was made in the year of Rome 708, 42 or 43 years before Christ.

The Roman kalendar, called also *Julian kalendar*, from its reformer Julius, is disposed into quadriennial periods; whereof the first three years, which he called *communes*, consist of 365 days; and the fourth, *bisextile*, of 366; by reason of the six hours, which in four years make a day, or somewhat less, for in 134 years an intercalary day is to be retrenched. On this account it was, that pope Gregory XIII. with the advice of Clavius and Ciaconius, appointed, that the hundredth year of each century should have no bisextile, excepting in each fourth century: that is, a subtraction is made of three bisextile days in the space of four centuries; by reason of the 11 minutes wanting in the six hours whereof the bisextile consists.

The reformation of the kalendar, or the *new style*, as we call it, commenced on the fourth of October 1582, when ten days were thrown out at once; so many having been introduced into the computation since the time of the council of Nice, in 325, by the defect of 11 minutes.

*Julian Christian Kalendar*, is that wherein the days of the week are determined by the letters A, B, C, D, E, F, G, by means of the solar cycle; and the new and full moons, especially the paschal full moon, with the feast of Easter, and the other moveable feasts depending thereon, by means of golden numbers, rightly disposed through the Julian year. See *Cycle*, and *Golden Number*.

In this kalendar, the vernal equinox is supposed to be fixed to the 21st day of March; and the cycle of 19 years, or the golden numbers, constantly to indicate the places of the new and full moons; yet both are erroneous. And hence arose a very great irregularity in

the time of Easter. To shew this error the more apparently, let us apply it to the year 1715. In this year, then, the vernal equinox falls on the tenth of March; and therefore comes too early by 11 days. The paschal full-moon falls on the 7th of April; and therefore too late, with regard to the cycle, by three days. Easter, therefore, which should have been on the 10th of April, was that year on the 17th. The error here lies only in the metempsychosis, or position of the moon, through the defect of the lunar cycle. If the full moon had fell on the 11th of March, Easter would have fallen on the 13th of March; and therefore the error arising from the anticipation of the equinox, would have exceedingly augmented that arising from the position. These errors, in course of time, were so multiplied, that the kalendar no longer exhibited any regular Easter. Pope Gregory XIII. therefore, by the advice of Aloysius Lilius, in 1582, threw 10 days out of the month of October, to restore the equinox to its place, viz. the 21st of March; and thus introduced the form of the Gregorian year, with such a provision, as that the equinox should be constantly kept to the 21st of March. The new moons and full moons, by advice of the same Lilius, were not to be indicated by golden numbers, but by epacts. The kalendar, however, was still retained in Britain, without this correction: whence there was a difference of 11 days between our time and that of our neighbours. But by 24 Geo. II. c. 23. the Gregorian computation is established here, and accordingly took place in 1752.

*Gregorian Kalendar*, is that which, by means of epacts, rightly disposed thro' the several months, determines the new and full moons, and the time of Easter, with the moveable feasts depending thereon, in the Gregorian year.

The Gregorian kalendar, therefore, differs from the Julian, both in the form of the year, and in that epacts are substituted in lieu of golden numbers: for the use and disposition whereof, see *EPACT*, in the *APPENDIX*.

Though the Gregorian kalendar be preferable to the Julian, yet it is not without its defects (perhaps, as Tycho Brahe and Cassini imagine, it is impossible ever to bring the thing to a perfect justness.) For, first, the Gregorian intercalation does not hinder, but that the equinox sometimes succeeds the 21st of March, as far as the 23d; and sometimes anticipates it, falling on the 19th; and the full moon, which falls on the 20th of March, is sometimes the paschal; yet not so accounted by the Gregorians. On the other hand, the Gregorians account the full moon of the 22d of March, the paschal; which yet, falling before the equinox, is not paschal. In the first case, therefore, Easter is celebrated in an irregular month; in the latter, there are two Easters in the same ecclesiastical year. In like manner, the cyclical computation being founded on mean full-moons, which yet may precede or follow the true ones by some hours, the paschal full-moon may fall on Saturday, which is yet referred by the cycle to Sunday: whence, in the first case, Easter is celebrated eight days later than it should be; in the other, it is celebrated on the very day of the full moon, with the Jews and Quartodeciman heretics; contrary to the decree of the council of Nice. Scaliger and Calvisius shew other faults in the Gregorian kalendar, arising from the



Kalendar.

negligence and inadvertency of the authors: yet is this kalendar adhered to by the Romanists throughout Europe, &c. and used wherever the Roman breviary is used.

*Reformed, or Corrected, KALENDAR,* is that which, setting aside all apparatus of golden numbers, epacts, and dominical letters, determines the equinox, with the paschal full-moon, and the moveable feasts depending thereon, by astronomical computation, according to the Rudolphine Tables.

This kalendar was introduced among the Protestant states of Germany in the year 1700, when 11 days were at once thrown out of the month of February; so that in 1700, February had but 18 days: by this means, the corrected style agrees with the Gregorian. This alteration in the form of the year, they admitted for a time; in expectation that, the real quantity of the tropical year being at length more accurately determined by observation, the Romanists would agree with them on some more convenient intercalation.

*Construction of a KALENDAR, or Almanac.* 1. Compute the sun's and moon's place for each day of the year; or take them from ephemerides. 2. Find the dominical letter, and, by means thereof, distribute the kalendar into weeks. 3. Compute the time of Easter, and thence fix the other moveable feasts. 4. Add the immovable feasts, with the names of the martyrs. 5. To every day add the sun's and moon's place, with the rising and setting of each luminary; the length of day and night; the crepuscula, and the aspects of the planets. 6. Add, in the proper places, the chief phases of the moon, and the sun's entrance into the cardinal-points; *i. e.* the solstices and equinoxes; together with the kalends and the setting, especially heliacal, of the planets and chief fixed stars. See ASTRONOMY.

The duration of the crepuscula, or the end of the evening and beginning of the morning twilight, together with the sun's rising and setting, and the length of days, may be transferred from the kalendars of one year, into those of another; the differences in the several years being too small to be of any consideration in civil life.

Hence it appears, that the construction of a kalendar has nothing in it of mystery, or difficulty, if tables of the heavenly motions be at hand.

Some divide kalendars or almanacs into public and private, perfect and imperfect; others into heathen and Christian.

Public almanacs are those of a larger size, usually hung up for common or family use; private are those of a smaller kind, to be carried about either in the hand, inscribed on a staff, or in the pocket; perfect, those which have the dominical letters as well as primes and feasts inscribed on them; imperfect, those which have only the primes and immovable feasts. Till about the fourth century, they all carry the marks of heathenism; from that age to the seventh, they are generally divided between heathenism and Christianity.

Almanacs are of somewhat different composition, some containing more points, others fewer. The essential part is the kalendar of months and days, with the risings and setting of the sun, age of the moon, &c. To these are added various parerga, astronomical, astrological, meteorological, chronological, and even

political, rural, medical, &c. as calculations, and accounts of eclipses, solar ingresses, aspects, and configurations of the heavenly bodies, lunations, heliocentrical and geocentrical motions of the planets, prognostics of the weather, and predictions of other events, tables of the planetary motions, the tides, terms, interest, twilight, equation, kings, &c.

*Julian or Jellalean KALENDAR,* is a correction of the Persian kalendar, made by order of sultan Ghaladdin, in the 467th year of the Hegira; of Christ 1089.

KALENDAR, is also applied to divers other compositions respecting the 12 months of the year.

In this sense, Spencer has given the shepherd's kalendar; Evelyn, and Miller, the gardener's kalendar, &c.

KALENDAR, is used for the catalogue, or fasti, anciently kept in each church, of the saints, both universal, and those particularly honoured in each church; with their bishops, martyrs, &c. Kalendars are not to be confounded with martyrologies; for each church had its peculiar kalendar, whereas the martyrologies regarded the whole church in general, containing the martyrs and confessors of all the churches. From all the several kalendars were formed one martyrology: so that martyrologies are posterior to kalendars.

KALENDAR, is also extended to an orderly table, or enumeration of persons or things.

Lord Bacon wishes for a kalendar of doubts. A late writer has given a kalendar of the persons who may inherit estates in fee-simple.

KALENDAR, *Kalendarium*, originally denoted among the Romans, a book containing an account of moneys at interest, which become due on the kalends of January, the usual time when the Roman usurers let out their money.

KALENDAR *Months*, the solar months, as they stand in the kalendar, viz. January 31 days, &c.

*Astronomical KALENDAR*, an instrument engraved upon copper-plates, printed on paper, and passed on board, with a brass slider which carries a hair, and shews by inspection the sun's meridian altitude, right ascension, declination, rising, setting, amplitude, &c. to a greater exactness than our common globes will shew.

KALENDAR of *Prisoners*. See CALENDAR.

KALENDAR *Brothers*, a sort of devout fraternities, composed of ecclesiastics as well as lay-men; whose chief business was to procure masses to be said, and alms distributed, for the souls of such members as were deceased. They were also denominated *kalend-brothers*, because they usually met on the kalends of each month, though in some places only once a quarter.

KALENDAR *FEASTUM*. The Christians retained much of the ceremony and wantonness of the kalends of January, which for many ages was held a feast, and celebrated by the clergy with great indecencies, under the names *sestum kalendarum*, or *hypodacnorum*, or *sultorum*, that is, the feast of fools: sometimes also *libertas decembris*. The people met masked in the church; and in a ludicrous way proceeded to the election of a mock pope, or bishop, who exercised a jurisdiction over them suitable to the festivity of the occasion. Fathers, councils, and popes, long laboured to restrain this licence, to little purpose. We find the

Kalendar, Kalendarium.

Kalenders. the feast of the kalends in use as low as the close of the 15th century. Du Cange.

KALENDERS. See CALENDERS.

KALENDS, or CALENDS, in the Roman chronology, the first day of every month.—The word is formed from *calare*, I call, or proclaim; because, before the publication of the Roman fasti, it was one of the offices of the pontifices to watch the appearance of the new moon, and give notice thereof to the *rex sacrficulus*; upon which a sacrifice being offered, the pontiff summoned the people together in the capitol, and there, with a loud voice, proclaimed the number of kalends, or the day whereon the nones would be; which he did by repeating this formula, as often as there were days of kalends, *Calo Juno Novella*. Whence the name *calende* was given thereto, from *calo*, *calare*. This is the account given by Varro. Others derive the appellation hence, That the people being convened on this day, the pontifex called, or proclaimed, the several feasts or holidays in the month; a custom which continued no longer than the year of Rome 450, when C. Flavius, the curule ædile, ordered the fasti, or kalendar, to be set up in public places, that every body might know the difference of times, and the return of the festivals.

The kalends were reckoned backwards, or in a retrograde order. Thus, v. g. the first of May being the kalends of May; the last, or 30th of April, was the *pridie kalendarum*, or second of the kalends of May; the 29th of April, the third of the kalends, or before the kalends: and so back to the 13th, where the ides commence; which are, likewise, numbered invertedly to the fifth, where the nones begin; which are numbered after the same manner to the first day of the month, which is the kalends of April. See IDES, and NONES.

The rules of computation by kalends, are included in the following verses:

*Prima dies mensis cujusque est dicta kalendæ:  
Sex Maius nonas, October, Julius, & Mars;  
Quatuor at reliqui: habet idus quilibet octo.  
Inde dies reliquæ omnes die esse kalendas;  
Quas retro numerans dices a mense sequente.*

To find the day of the kalends answering to any day of the month we are in; see how many days there are yet remaining of the month, and to that number add two: for example, suppose it the 22d day of April; it is then the 10th of the kalends of May. For April contains 30 days: and 22 taken from 30, there remains eight; to which two being added, the sum is ten. The reason of adding two is, because the last day of the month is called *secundo kalendas*, the last but one *tertio kalendas*, &c.

The Roman writers themselves are at a loss for the reason of this absurd and whimsical manner of computing the days of the month: yet it is still kept up in the Roman chancery; and by some authors, out of a vain affectation of learning, preferred to the common, more natural, and easy manner.

KALENDS, are also used in church-history to denote conferences anciently held by the clergy of each deanry, on the first day of every month, concerning their duty and conduct, especially in what related to the imposition of penance.

KALENDS of January, in Roman antiquity, was a

solemn festival consecrated to Juno and Janus; where-in the Romans offered vows and sacrifices to those deities, and exchanged presents among themselves, as a token of friendship.

It was only a melancholy day to debtors, who were then obliged to pay their interests, &c. Hence Horace calls it *tristes kalendæ*; Lib. i. Scrm. Sat. 3.

KALI, in botany. See SALSOLA.

KALISH, a province of Lower Poland, with the title of a palatinate. It is bounded on the west by the palatinate of Bofnia, on the east by that of Syrad, on the north by Regal Prussia, and on the south by Silesia. Kalish is the capital town.

KALISH, a town of Lower Poland, and capital of a palatinate of the same name, where the jesuits have a magnificent college. It is seated on the river Prozna, in a morass, which renders it difficult of access. E. Long. 18. o. N. Lat. 52. 20.

KALMIA, in botany, a genus of the monogynia order, belonging to the decandria class of plants. Of this genus there are two species; both of them hardy evergreen shrubs, growing four or five feet high; adorned with oval and spear-shaped entire leaves, and monopetalous five-parted flowers, of a pale or bright red colour, in close round bunches, appearing in June and July. They may be propagated either by seeds, suckers, or layers; and though natives of America, will succeed any where in the open ground in this country.

KALMUCKS, a tribe of Tartars, called also *E-luthi*, inhabiting the larger half of what the Europeans call *Western Tartary*. Their territory extends from the Caspian sea, and the river *Paik* or *Ural*, in 72 degrees of longitude from Ferro, to mount Altay, in 110 degrees, and from the 40th to the 52d degree of north latitude; whence it may be computed about 1930 miles in length from west to east, and in breadth from north to south about 650 miles where broadest. It is bounded on the north by Russia and Siberia, from which it is separated by a chain of mountains; on the east by mount Altay; on the south by the countries of Karazm and the two Bukharias, from which it is also separated partly by a chain of mountains, and partly by some rivers.—For a description of the country, the manners, &c. of the inhabitants, see TARTARY.

KAMAKURA, a famous island of Japan, about three miles in circumference, lying on the south coast of Niphon. It is here they confine their great men when they have committed any fault. The coast of this island is so steep, that they are forced to be lifted up by cranes.

KAMINIECK, a very strong town of Poland, and capital of Podolia, with two castles, and a bishop's see. It was taken by the Turks in 1672, who gave it back in 1690, after the treaty of Carlowitz. It is seated on a craggy rock, in E. Long. 27. 30. N. Lat. 48. 58.

KAMTCHATKA, KAMSCHATKA, or *Kamchatka*; a large peninsula on the north-eastern part of Asia, lying between 51 and 62 degrees of north latitude, and between 173 and 182 degrees of east longitude from the isle of Ferro. It is bounded on the east and south by the sea of Kamtschatka, on the west by the seas of Ochotsk and Penhsink, and on the

Kalends  
i.  
Kamchatka

Kamchatka the north by the country of the Koriat.

<sup>1</sup> When first visited by the Russians.

This peninsula was not discovered by the Russians before the end of the last century. It is probable, however, that some of that nation had visited Kamchatka before the time above mentioned. For when Volodimir Atlassoff entered upon the conquest of this peninsula in 1697, he found that the inhabitants had already some knowledge of the Russians. A common tradition as yet prevails among them, that, long before the expedition of Atlassoff, one Feodotoff and his companions had resided among them, and had intermarried with the natives; and they still shew the place where the Russian habitations stood. None of the Russians remained when Atlassoff first visited Kamchatka. They are said to have been held in great veneration, and almost deified, by the natives; who at first imagined that no human power could hurt them, until they quarrelled among themselves, and the blood was seen to flow from the wounds which they gave each other; and soon after, upon a separation taking place, they were all killed by the natives.—These Russians were thought to be the remains of a ship's crew who had failed quite round the north-eastern promontory of Asia called *Tschukotkoi-Nefs*. The account we have of this voyage is as follows.—In 1648, seven ketches or vessels sailed from the mouth of the river *Kovyma* or *Kolyma*, lying in the frozen ocean in about 72 degrees north latitude, and 173 or 174 east longitude from Ferro, in order to penetrate into the eastern ocean. Four of these were never more heard of; the remaining three were commanded by Simon Deshneff, Gerasim Ankudinoff, two chiefs of the Cossacs, and Feodotoff Alexeeff, head of the Promyshlennics, or wandering Russians, who occasionally visited Siberia. Each vessel was probably manned with about 30 persons. They met with no obstructions from the ice, but Ankudinoff's vessel was wrecked on the promontory above mentioned, and the crew were distributed on board the two remaining vessels. These two soon after lost sight of each other, and never afterwards rejoined. Deshneff was driven about by tempestuous winds till October, when he was shipwrecked on the northern part of Kamchatka. Here he was informed by a woman of Yakutsk, that Feodotoff and Gerasim had died of the scurvy; that part of the crew had been slain; and that a few had escaped in small vessels, who had never afterwards been heard off; and these were probably the people who, as we have already mentioned, settled among the Kamchatkans.

<sup>2</sup> Subdued by them.

As the inhabitants of this country were neither numerous nor warlike, it required no great force to subdue them; and in 1711 the whole peninsula was finally reduced under the dominion of the Russians.—For some years this acquisition was of very little consequence to the crown, excepting the small tribute of furs exacted from the inhabitants. The Russians indeed occasionally hunted, in this peninsula, foxes, wolves, ermines, fables, and other animals, whose skins form an extensive article of commerce among the eastern nations. But the fur-trade carried on from thence was very inconsiderable, until the series of islands mentioned in the next article were discovered; since which time the quantities of furs brought from these islands have greatly increased the trade of Kam-

chatka, and rendered it an important part of the Russian commerce.

The face of the country throughout the peninsula is chiefly mountainous. It produces, in some parts, birch, poplars, elders, willows, underwood, and berries of different sorts. Greens and other vegetables are raised with great facility; such as white cabbage, turneps, radishes, beet-root, carrots, and some cucumbers. Agriculture is in a very low state; owing chiefly to the nature of the soil and the severe frosts: for though some trials have been made with respect to the cultivation of grain; and oats, barley, and rye, have been sown; yet no crop has ever been procured sufficient in quantity or quality to answer the trouble of raising it. Hemp, however, has of late years been cultivated with great success.—Every year a vessel belonging to the crown sails from Ochotsk to Kamchatka laden with salt, provisions, corn, and Russian manufactures; and returns in June or July of the following year with skins and furs.

Many traces of volcanoes have been observed in this peninsula; and there are some mountains which are in a burning state at present. The most considerable of these is situated near the middle of the peninsula. In 1762, a great noise was heard issuing from the inside of that mountain, and flames of fire were seen to burst from different parts. These flames were immediately succeeded by a large stream of melted snow-water, which flowed into the neighbouring valley, and drowned two natives who were there on a hunting party. The ashes and burning matters thrown from the mountain were spread over a surface of 300 versts. In 1767, was another discharge, but less considerable. Every night flames of fire were observed streaming from the mountain; and considerable damage was done by the eruption which attended them. Since that year no flames have been seen; but the mountain emits a constant smoke.

Kamchatka is divided by the Russians into four districts; and the government of the whole is dependent upon, and subject to, the inspection of the chancery of Ochotsk. The whole Russian force stationed in this peninsula, amounts to no more than 300 men. The present population of Kamchatka is very small, amounting to scarce 4000 souls. Formerly the inhabitants were more numerous; but in 1768, the small-pox carried off 5368 persons. There are now only about 700 males in the whole peninsula who are tributary, and few more than 100 in the neighbouring islands, called the *Kuril Isles*, who are subject to Russia. The fixed annual tribute consists in 279 fables, 464 red foxes, 50 sea-otters with a dam, and 38 cub otters. All furs exported from Kamchatka pay a duty of 10 per cent. to the crown; the tenth part of the cargoes bought from the neighbouring islands is also delivered into the customs.

The natives of Kamchatka are as wild as the count-try itself. Some of them have no fixed habitations, but wander from place to place, with their herds of rein-deer; others have settled habitations, and reside upon the banks of the rivers, and the shore of the Penschinsk sea, living upon fish and sea-animals, and such herbs as grow upon the shore: the former dwell in huts, covered with deer-skins; the latter in places dug out of the earth; both in a very barbarous manner.



*Kamchatka* ner. Their dispositions and tempers are rough; and they are entirely ignorant of letters or religion. The natives are divided into three different people, namely, the Kamchatkans, Koreki, and Kuriles. The Kamchatkans live upon the fourth side of the promontory of Kamchatka: the Koreki inhabit the northern parts on the coast of the Penchinka sea, and round the eastern ocean, almost to the river Anadir, whose mouth lies in that ocean almost in 68° N. Lat.: the Kuriles inhabit the islands in that sea, reaching as far as those of Japan. The Kamchatkans have this particular custom, that they endeavour to give every thing a name in their language which may express the property of it; but if they do not understand the thing quite well themselves, then they take a name from some foreign language, which perhaps has no relation to the thing itself; as, for example, they call a priest *bogbeg*, because probably they hear him use the word *bogbeg*, God; bread they call *brightatin augb*, that is, Russian root; and thus of several other words to which their language is a stranger.

It appears probable, that the Kamchatkans lived formerly in Mungalia, beyond the river Amur, and made one people with the Mungals; which is farther confirmed by the following observations, such as the Kamchatkan having several words common to the Mungal Chinese language, as their terminations in ong, ing, oang, chin, cha, ching, kshi, kfung; it would be still a greater proof, if we could hear several words and sentences the same in both languages. The Kamchatkans and Mungals also are both of a middling stature, are swarthy, have black hair, a broad face, a sharp nose, with the eyes falling in, eye-brows small and thin, a hanging belly, slender legs and arms; they are both remarkable for cowardice, boasting, and slavishness to people who use them hard, and for their obstinacy and contempt of those who treat them with gentleness.

Although, in outward appearance, they resemble the other inhabitants of Siberia, yet the Kamchatkans differ in this, that their faces are not so long as the other Siberians; their cheeks stand more out, their teeth are thick, their mouth large, their stature middling, and their shoulders broad, particularly those people who inhabit the sea-coast.

Before the Russian conquest, they lived in perfect freedom, having no chief, being subject to no law, nor paying any taxes; the old men, or those who were remarkable for their bravery, bearing the principal authority in their villages, though none had any right to command or inflict punishment.

Their manner of living is slovenly to the last degree: they never wash their hands nor face, nor cut their nails; they eat out of the same dish with the dogs, which they never wash; they never comb their heads, but both men and women plait their hair in two locks, binding the ends with small ropes. When any hair starts out, they sew it with threads to make it lie close; by this means they have such a quantity of lice, that they can scrape them off by handfuls, and they are nasty enough even to eat them. Those that have not natural hair sufficient, wear false locks, sometimes as much as weigh ten pounds, which makes their heads look like a haystack.

They place their chief happiness in idleness, and

satisfying their natural lust and appetites; which incline them to singing, dancing, and relating of love-stories; and they think it more eligible to die than to lead a disagreeable life; which opinion often leads them to self-murder. This was so common after the conquest, that the Russians had great difficulty to put a stop to it. They have no notion of riches, fame, or honour; therefore covetousness, ambition, and pride, are unknown among them. On the other hand, they are careless, lustful, and cruel: these vices occasion frequent quarrels and wars among them, sometimes with their neighbours, not from a desire of increasing their power, but from some other causes; such as the carrying off their provisions, or rather their girls, which is frequently practised as the most summary method of procuring a wife. Their trade is almost entirely confined to procuring the immediate necessities and conveniences of life. They sell the Koreki fables, fox and white dog skins, dried mushrooms, and the like, in exchange for cloaths made of deer-skins and other hides. Their domestic trade consists in dogs, boats, dishes, troughs, nets, hemp, yarn, and provisions; and this kind of barter is carried on under a great show of friendship; for when one wants any thing that another has, he goes freely to visit him, and without any ceremony makes known his wants, although perhaps he never had any acquaintance with him before: the host is obliged to behave according to the custom of the country, and give his guest what he has occasion for; but he may afterwards return the visit, and must be received in the same manner. They fill almost every place in heaven and earth with different spirits, and offer them sacrifices upon every occasion. Some carry little idols about them, or have them placed in their dwellings; but, with regard to God, they not only neglect to worship him, but, in case of troubles and misfortunes, they curse and blaspheme him.

It is very diverting to see them attempt to reckon above ten: for having reckoned the fingers of both hands, they clasp them together, which signifies ten; then they begin with their toes, and count to twenty; after which they are quite confounded, and cry, Metcha? that is, Where shall I take more? They reckon ten months in the year, some of which are longer and some shorter; for they do not divide them by the changes of the moon, but by the order of particular occurrences that happen in those regions. They commonly divide our year into two, so that winter is one year, and summer another: the summer year begins in May, and the winter in November. They do not distinguish the days by any particular appellation, nor form them into weeks or months, nor yet know how many days are in the month or year. They mark their epochs by some remarkable thing or other, such as the arrival of the Russians, or the first expedition to Kamchatka.

If any one kills another, he is to be killed by the relations of the person slain. They burn the hands of people who have been frequently caught in theft; but, for the first offence, the thief must restore what he hath stolen, and live alone in solitude, without expecting the assistance of others. They never have any disputes about their land, or their huts, every one having land and water more than sufficient for his wants.

They

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They think themselves the happiest people in the world, and look upon the Russians who are settled among them with contempt. However, this notion begins to change; for the old people, who are confined in their customs, drop off, and the young ones, being converted to the Christian religion, adopt the customs of the Russians, and despise the barbarity and superstition of their ancestors.

In every otlog, or large village, by order of her imperial majesty, is appointed a chief, who is sole judge in all causes, except those of life and death; and not only these chiefs, but even the common people, have their chapels for worship. Schools are also erected in almost every village, to which the Kamchatkans send their children with great pleasure: by this means it is to be hoped, that barbarity will be in a short time rooted out from amongst them.

10  
Manner of  
building  
their huts.

Under the name of *otlog*, is understood every habitation consisting of one or more huts, all surrounded by an earthen wall or palisado.—The huts are built in the following manner: they dig a hole in the earth about five feet deep, the breadth and length proportioned to the number of people designed to live in it. In the middle of this hole they plant four thick wooden pillars; over these they lay balks, upon which they form the roof or ceiling, leaving in the middle a square opening which serves them for a window and chimney; this they cover with grass and earth, so that the outward appearance is like a round hillock; but within they are an oblong square, with the fire in one of the long sides of the square: between the pillars, round the walls of their huts, they make benches, upon which each family lies separately; but on that side opposite to the fire, there are no benches, it being designed for their kitchen-furniture, in which they dress their viands for themselves and dogs. In those huts where there are no benches, there are balks laid upon the floor, and covered with mats. They adorn the walls of their huts with mats made of grass. They enter their huts by ladders, commonly placed near the fire-hearth; so that, when they are heating their huts, the steps of the ladder become so hot, and the smoke so thick, that it is almost impossible for a stranger to go up or down without being burnt, and even stifled to death; but the natives find no difficulty in it; and though they can only fix their toes on the steps of the ladder, they mount like squirrels; nor do the women hesitate to go through this smoke with their children upon their shoulders, though there is another opening through which the women are allowed to pass; but if any man pretend to do the same, he would be laughed at. The Kamchatkans live in these huts all the winter, after which they go into others called *balagans*: these serve them not only to live in during the summer, but also for magazines. They are made in the following manner: nine pillars, about two fathoms long, or more, are fixed in the ground, and bound together with balks laid over them, which they cover with rods, and over all lay grass, fastening spars, and a round sharp roof at top, which they cover with bramble, and thatch with grass. They fasten the lower ends of the spars to the balks with ropes and thongs, and have a door on each side, one directly opposite to the other. They make use of the same kind of huts to keep their fish, &c. till winter

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comes on, when they can more easily remove it; and this without any guard, only taking away the ladders. If these buildings were not so high, the wild beasts would undoubtedly plunder them; for, notwithstanding all their precaution, the bears sometimes climb up and force their way into their magazines, especially in the harvest, when the fish and berries begin to grow scarce.

The southern Kamchatkans commonly build their villages in thick woods, and other places which are naturally strong, not less than 20 versts from the sea; and their summer habitations are near the mouths of the rivers; but those who live upon the Penchinsk sea, and the eastern ocean, build their villages very near the shore. They look upon that river near which their village is situated, as the inheritance of their tribe.

11  
Method of  
kindling  
fire.

In order to kindle fire, they use a board of dry wood with round holes in the sides of it, and a small round stick; this they rub in a hole till it takes fire; and instead of tinder they use dry grass beat soft. These instruments are held in such esteem by the Kamchatkans, that they are never without them, and they value them more than our steels and flints; but they are excessively fond of iron instruments, such as hatchets, knives, or needles: nay, at the first arrival of the Russians, a piece of broken iron was looked upon as a great present; and even now they receive it with thankfulness, finding use for the least fragment, either to point their arrows or make darts, which they do by hammering it out cold between two stones. As some of them delight in war, the Russian merchants are forbid to sell them any warlike instruments: but they are ingenious enough to make spears and arrows out of the iron pots and kettles which they buy; and they are so dexterous, when the eye of a needle breaks, as to make a new eye, which they will repeat until nothing remains but the point.

12  
Construction of their  
boats.

The Kamchatkans make their boats of poplar-wood; but the Kuriles, not having any wood of their own, make use of what is thrown on shore by the sea, and is supposed to come from the coasts of Japan, China, or America. The northern inhabitants of Kamchatka, the settled Koreki and Tschukotskoi, for want of proper timber and plank, make their boats of the skins of sea-animal. They sew the pieces together with whales beards, and caulk them with moss or nettles beat small. These boats hold two persons; one of which sits in the prow, and the other in the stern. They push them against the stream with poles, which is attended with great trouble: when the current is strong, they can scarcely advance two feet in ten minutes; notwithstanding which, they will carry these boats, fully loaded, sometimes 20 versts, and, when the stream is not very strong, even 30 or 40 versts. The larger boats carry 30 or 40 pood; when the goods are not very heavy, they lay them upon a float or bridge resting upon two boats joined together. They use this method in transporting their provisions down the stream, and also to and from the islands.

Their cloaths, for the most part, are made of the skins of deer, dogs, several sea and land animals, and even of the skins of birds, those of different animals being frequently joined in the same garment. They

13  
Of their  
clothes.

22 U

They make

make the upper garment after two fashions; sometimes cutting the skirts all of an equal length, and sometimes leaving them long behind in form of a train, with wide sleeves of a length to come down below the knee, and a hood or caul behind, which in bad weather they put over their heads below their caps; the opening above is only large enough to let their heads pass: they sew the skins of dogs feet round this opening, with which they cover their faces in cold stormy weather; and round their skirts and sleeves they put a border of white dog-skin; upon their backs they sew the small furred skins of different colours. They commonly wear two coats; the under coat with the hair side inwards, the other side being dyed with alder; and the upper with the hair outwards. For the upper garment they choose black, white, or speckled skins, the hair of which is most esteemed for the beauty of its colour.

Men and women, without distinction, use the above-mentioned garments, their dress only differing in their under-clothing and in the covering of their feet and legs. The women have an under-garment, which they commonly wear at home in the house, consisting of a breeches and waistcoat sewed together. The breeches are wide, like those of the Dutch skippers, and tie below the knee; the waistcoat is wide above, and drawn round with a string. The summer habits are made of dressed skins without hair; their winter-garment is made of deer or stone-ram skins with the hair on. The undress or household habit of the men, is a girdle of leather, with a bag before, and likewise a leathern apron to cover them behind; these girdles are sewed with hair of different colours. The Kamchatkans used formerly to go a-hunting and fishing during the summer in this dress; but now this fashion is changed, and they wear linen shirts, which they buy from the Russians.

The covering of their feet and legs is made of skins of different sorts: in the summer-time, during the rains, they wear the skins of seal with the hair outwards; but their most common covering is the skin of the legs of the rein-deer, and sometimes of the legs of other beasts, the thaggiest they can find, to preserve them against the cold. But the buskins which both the Cossacs and Kamchatkans use in their finest dress, are made in the following manner: the sole is of white seal skin, the upper part of white fine leather, the hind quarters of white dog skin; what comes round the legs is of dressed leather, or dyed seal-skin; the upper parts are embroidered. These buskins are so extraordinary, that if a bachelor is observed to wear them, he is immediately concluded to be upon a scheme of courtship.

They wear the same sort of caps as the people of Yakutski. In summer they have a sort of hats of birch bark tied about their head. The Kuriles use in the summer-time caps made of plated grass. The women's head-dress is the perukes that we formerly mentioned; and these were so dear to them, that when they came to be Christians, they were with difficulty prevailed upon to quit this dress for one more decent: however, at present, round the Russ settlements, all is entirely changed, the women wearing shirts, ruffles, waistcoats, caps, and ribbands; which change nobody now complains of, except the very old people.

The women do all their work in mittins; they formerly never washed their faces, but now they use both white and red paint: for white paint they make use of a rotten wood; and for red a sea-plant, which they boil in seal's fat, and, rubbing their cheeks with it, make them very red. They dress most in the winter time, especially when they either receive or pay visits.

The common cloaths for a Kamchatkan and his family will not cost him less than 100 rubbles; for the coarsest worsted stockings, which cost in Russia 20 kopecks, cannot be bought here for less than a ruble; and all other things are sold in the same proportion. The Kuriles are more able to buy good cloaths than the Kamchatkans; for they can purchase for one sea-beaver, as much as the Kamchatkans can for twenty foxes; and one beaver costs the Kuriles no more trouble than five foxes do the Kamchatkans; for he must be a good hunter who catches more than ten foxes in the winter; and a Kurile thinks himself unlucky if he doth not catch three beavers in the season; besides which, great numbers are thrown upon the shore by storms.

The Kamchatkans divide their fish into six parts; Their diet. the sides and tail are hung up to dry; the back and thinner part of the belly are prepared apart, and generally dried over the fire; the head is laid to four in pits, and then they eat it like salt fish, and esteem it much, though the stink is such that a stranger cannot bear it; the ribs and the flesh which remain upon them they hang up to dry, and afterwards pound for use; the larger bones they likewise dry for food for their dogs: in this manner all these different people prepare the yokola, which is their principal food, or, one may say, household bread; and they eat it for the most part dry.

Their second favourite food is caviar, or the roes of fish, which they prepare three different ways. They dry the roe whole in the air; or take it out of the skin which envelops it, and spreading it upon a bed of grass, dry it before the fire; or, lastly, make rolls of it with the leaves of grass, which they also dry. They never take a journey or go to hunting without dry caviar; and, if a Kamchatkan has a pound of this, he can subsist without any other provision a great while: for every birch and alder tree furnishes him with bark, which, with his dried caviar, makes him an agreeable meal; but they cannot eat either separately, for the caviar sticks like glue to the teeth; and it is almost impossible to swallow the bark, chewed ever so long by itself. There is still a fourth method, which both Kamchatkans and Koroki use in preparing their caviar: the first having covered the bottom of a pit with grass, they throw the fresh caviar into it, and leave it there to grow sour: the Koroki tie theirs in bags, and leave it to four; this is esteemed their most delicate dish.

There is a third sort of diet, called by the Kamchatkans *chupriki*, which is prepared in this manner: in their huts, over the fire-place, they make a bridge of stakes, upon which they lay a heap of fish, which remains there until the hut becomes as warm as a bag-nio. If there is no great thickness of fish, one fire serves to dress it; but sometimes they are obliged to make two, three, or more fires. Fish dressed in this



manner is half roasted, half smoked, but has a very agreeable taste, and may be reckoned the best of all the Kamchatka cookery: for the whole juice and fat is prepared with a gradual heat, and kept in by the skin, from which they may, when done enough, be easily separated; and as soon as it is thus dressed, they take out the guts, and spread the body upon a mat to dry: this they afterwards break small, and, putting it into bags, carry it along with them for provision, eating it like the yokola.

The Kamchatkans have a dish which they esteem very much, called *haigul*: it is fish laid to grow four in pits; and, though the smell of it is intolerable, yet the Kamchatkans esteem it a perfume. This fish sometimes rots so much in the pits, that they cannot take it out without lades; in which case indeed they use it for feeding their dogs.

As for the flesh of land and the larger sea animals, they boil it in their troughs, with several different herbs and roots; the broth they drink out of lades and bowls, and the meat they take out upon boards, and eat in their hands. The whale and sea-horse fat they also boil with roots.

There is a principal dish at all their feasts and entertainments, called *selaga*, which they make by pounding all sorts of different roots and berries, with the addition of caviar, and whale and seal's fat.

Before the conquest, they seldom used any thing for drink but plain water, unless when they made merry; then they drank water which had stood some time upon mushrooms. At present they drink spirits as fast as the Russians. After dinner they drink water: and when they go to bed at night, set a vessel of water by them, with the addition of snow or ice to keep it cold, and always drink it up before morning. In the winter-time, they amuse themselves frequently by throwing handfuls of snow into their mouths: and the bridegrooms, who work with the fathers of their future brides, find it their hardest task to provide snow for the family in summer-time; for they must bring it from the highest hills, be the weather what it will, otherwise they would never be forgiven.

The Kamchatkans commonly travel in sledges drawn by dogs. The animals used for this purpose differ very little from the common house-dogs; they are of a middling size, of various colours, though there seem to be more white, black, and grey, than of any other. In travelling, they make use of those that are castrated, and generally yoke four to a sledge. They drive and direct their dogs with a crooked stick about four feet long, which they sometimes adorn with different coloured thongs; this is looked upon as a great piece of finery. They drive their sledge sitting upon their right side, with their feet hanging down; for it would be looked upon as a disgrace for a man to sit down at the bottom of the sledge, or to make use of any person to drive him, nobody doing this but the women. It is very difficult to travel in these sledges; for unless a man keeps the exactest balance, he is liable every moment, from the height and narrowness of them, to be overturned: in a rugged road this would be very dangerous, as the dogs never stop till they come to some house, or are entangled by something upon the road; especially in going down steep hills, when they run with all their force, and are

scarcely to be kept in; for which reason, in descending any great declivity, they unyoke all the dogs except one, and lead them softly down. They likewise walk up hills; for it is as much as the dogs can do to drag up the sledge empty. After a deep snow, before it has been hardened by a frost, there is no travelling with dogs till a road be made, which is effected by a man going before upon snow-shoes, whom they call *brodovshika*. The snow-shoes are made of two thin boards, separated in the middle, bound together at the ends, and with the fore part bent a little upwards. The *brodovshika*, having one of these shoes upon each foot, leaves the dogs and sledge, and going on clears the road for some way; then returning, leads forward the dogs and sledge so far as the road is made; a method which he must continue till he comes to some dwelling-house. This is very laborious; and it happens so often, that no driver ever gets out without his snow-shoes. When a storm of driven snow surprises them, they are obliged with all haste to seek the shelter of some wood, and stay there as long as the tempest lasts, which sometimes is a whole week. If they are a large company, they dig a place for themselves under the snow, and cover the entry with wood or brambles. Sometimes they hide themselves in caves or holes of the earth, wrapping themselves up in their furs; and when thus covered, they move or turn themselves with the greatest caution, lest they should throw off the snow; for under that they lie as warm as in their common huts: they only require a breathing-place; but their cloaths must not be tight or hard girt about them, for then the cold is insufferable. Another danger attending travellers is, that in the severest frost several rivers are not quite frozen over; and as the roads for the most part lie close upon the rivers, the banks being very steep, scarce a year passes without many being drowned. A disagreeable circumstance also to those who travel in these parts, is their sometimes being obliged to pass through copes, where they run the risk of having their eyes scratched out, or their limbs broken; for the dogs always run most violently in the worst roads, and, to free themselves, very often overturn their driver. The best travelling is in the month of March or April, when the snow is turned hard, or frozen a little at top; however, there is still this inconvenience attending it, that sometimes travellers are obliged to lodge two or three nights in desert places; and it is difficult to prevail upon the Kamchatkans to make a fire, either for warming themselves or dressing victuals, as they and their dogs eat dried fish, and find themselves so warm wrapped in their furs, that they want no other heat; nay, all the people of this climate bear cold so well, that they sleep in the open air as found as others in a warm bed, and awake next morning perfectly refreshed and alert. This seems to be so natural to all here, that some of them have been seen to lie down with their backs uncovered against a fire, and notwithstanding the fire has been burnt out long before morning, they continued to sleep on very comfortably, and without any inconvenience.

*Islands in the Sea of KAMCHATKA.* So many of these have been discovered by the Russians, that the existence of almost a continued chain of islands between the continents of Asia and America is now rendered

Kamchatka extremely probable. Many further discoveries of great importance to science, however, remain yet to be made, and may in part be expected on the return of the British navigators who lately failed to these distant regions. The islands already known are the Kuril isles, which stretch south-west towards the coasts of China or Japan, and are almost uninhabited; those called *Bearing's*, and *Copper-islands*, the Aleutian isles, and Fox-islands, or *Lysie Ostrova*, lie almost directly east, stretching nearly to 230° of Longitude east from Ferro. The first project of making discoveries in that tempestuous sea which lies between Kamchatka and America, was set on foot by Peter the Great of Russia. Captains Beering and Tschirikoff were employed in the undertaking; the former of whom was shipwrecked and died on the island which is still called by his name. As this lies at no great distance from Kamchatka, the inhabitants of the latter soon ventured over to it, as the sea-otters and other animals of that kind were accustomed to resort thither in great numbers.

16  
Copper-  
island de-  
scribed.

Mednoi Ostroff, or Copper-island, which lies in full sight of Bearing's island, was next visited. This island has its name from the great quantity of copper with which the north-east coast of it abounds, the only side which is known to the Russians. It is washed up by sea, and covers the shores in such abundance that many ships might be loaded with it. Perhaps an India trader might make a profitable voyage from thence to China, where this metal is in high demand. This copper is mostly in a metallic or malleable state, and many pieces seem as if they had formerly been in fusion. The island is not high; but has many hillocks, each of which has the appearance of having formerly been a volcano. With this kind of hillocks all the islands in the sea of Kamchatka abound, inasmuch that not a single island, though ever so small, was found without one; and many of them consisted of nothing else. In short, all the chain of islands above-mentioned may, without any stretch of imagination, be considered as thrown up by some late volcanoes. The apparent novelty of every thing seems to justify this conjecture: nor can any objection be derived from the vegetable productions with which these islands abound; for the summer after the lower district of Zutphen in Holland was gained from the sea, it was covered over with wild mustard.—All these islands are subject to frequent and violent earthquakes, and abound in sulphur. We are not informed whether any lava is found upon them; but a party-coloured stone as heavy as iron, probably a lava, is mentioned as being found there. From this account it is by no means improbable that the copper above-mentioned has been melted in some eruption.

17  
Bearing's  
island and  
the Aleu-  
tian isles.

Bearing's island is situated due east from Kamchatka, in the 185th degree of longitude, and Copper-island about one degree more to the eastward, and in the latitude of 54° north. The former is from 70 to 80 versts long, and stretches from north-west to south-east in the same direction as Copper-island. The latter is about 50 versts in length. About 300 versts east-by-south of Copper-island, lie the Aleutian isles; of which Attak is the nearest: it is rather larger than Bearing's island, and stretches from west to south-east. From thence, about 20 versts eastwards, is situated Semitski, extending from west to east; and near its extremity is another small island. To the south of the strait which

separates the two latter islands, and at the distance of Kamchatka 40 versts from both of them, lies Shimiya in a similar position, and not above 25 versts in length. All these islands lie between 54 and 55 degrees of north latitude.

18  
Fox-islands.

The Fox-islands are situated east-north-east from the Aleutians: the nearest of these, Atchak, is about 800 versts distant; it lies in 56° north latitude, and extends from west-south-west, towards east-north-east. It greatly resembles Copper-island, and is provided with a commodious harbour on the north. From thence all the other islands of this chain stretch in a direction towards north-east by east. The next to Atchak is Amlak, and about 15 versts distant; it is nearly of the same size, and has a harbour on its south side. Next follows Saugagamak at about the same distance, but somewhat smaller; from thence is 50 versts to Amuchta, a small rocky island; and the latter to Yunakfan, another small island. About 20 versts from Yunakfan there is a cluster of five small islands, or rather mountains, Kigalgil, Kagamila, Tigulak, Ulaga, and Tana-Unok; and which are therefore called by the Russians *Pat Sopki*, or the Five Mountains. Of these Tana-Unok lies most to the north-east, towards which the western point of Umnak advances within the distance of 20 versts.

Umnak stretches from south-west to north-east; it is 150 versts in length, and has a very considerable bay on the west end of the northern coast, in which there is a small island or rock, called *Adugak*; and on the south-side Shemalga, another rock. The western point of Agbun Alashka, or Unalashka, is separated from the east end of Umnak by a strait near 20 versts in breadth. The position of these two islands is similar; but Agbunashka is much the largest, and is above 200 versts long. It is divided towards the north-east into three promontories, one of which runs out in a westerly direction, forming one side of a large bay on the north-coast of the island: the second stretches out north-east, ends in three points, and is connected with the island by a small neck of land. The third or most southerly one is separated from the last-mentioned promontory by a deep bay. Near Unalashka towards the east lies another small island called *Shirkin*. About 20 versts from the north-east promontory of Agbunashka lie four islands: the first, Akutan, is about half as big as Umnak; a verlt further is the small island Akun; a little beyond is Akunok; and lastly Kigalga, which is the smallest of these four, and stretches with Akun and Akunok almost from north to south. Kigalga is situated about the 61st degree of latitude. About 100 versts from thence lies an island called *Unimak*, upon which a Russian navigator (Captain Krenitzin) wintered; and beyond it the inhabitants said there was a large tract of country called *Alashka*, of which they did not know the boundaries.

The Fox-islands are in general very rocky, without containing any remarkably high mountains: they are destitute of wood; but abound in rivulets and lakes, which are mostly without fish. The winter is much milder than in Siberia; the snow seldom falls before the beginning of January, and continues on the ground till the end of March. There is a volcano in Amuchta, and sulphur is produced on another island, in some others are springs hot enough to boil provisions. Sulphu-



Kamchatka phureous flames also are sometimes seen at night upon the mountains of Unalaska and Akutan.

19  
Manners,  
&c. of the  
inhabitants.

The Fox-lands are tolerably populous in proportion to their size. The inhabitants are entirely free, and pay tribute to no one; they are of a middle stature, and live, both in summer and winter, in holes dug in the earth. No signs of religion were found among them. Several persons indeed pass for forerers, pretending to know things past and to come; and are accordingly held in high esteem, but without receiving any emolument. Filial duty and respect towards the aged are not held in estimation by these islanders. They are not, however, deficient in fidelity towards each other; they are of a lively and cheerful temper, though rather impetuous, and naturally prone to anger. In general, they do not observe any rules of decency; but follow all the calls of nature publicly, and without the least reserve. Their principal food consists in fish and other sea-animals, small shell-fish, and sea-plants; their greatest delicacies are wild lilies and other roots, together with different kinds of berries. When they have laid in a store of provisions, they eat at any time of the day without distinction; but in case of necessity, they are capable of fasting several days together. They seldom heat their dwellings: but when they are desirous of warming themselves, they light a bundle of hay, and stand over it; or else they set fire to train-oil, which they pour into a hollow stone. They feed their children when very young with the coarsest flesh, and for the most part raw. If an infant cries, the mother immediately carries it to the sea-side, and, be it summer or winter, holds it naked in the water, until it is quiet. This custom, it is said, is so far from doing the children any harm, that it hardens them against the cold; and accordingly, they go barefooted through the winter without the least inconvenience. They are also trained to bathe frequently in the sea; and it is an opinion generally received among the islanders, that by these means they are rendered bold and fortunate in fishing.

The men wear shirts made of the skins of cormorants, sea-divers, and gulls; and, in order to keep out the rain, they have upper garments of the bladders and other intestines of sea-lions, sea-calves, and whales, blown up and dried. They cut their hair in a circular form quite close to their ears; and shave also a round place on the top. The women, on the contrary, let the hair descend over the forehead as low as the eyebrows, and tie the remaining part in a knot upon the top of the head. They pierce the ears, and hang in them bits of coral, which they get from the Russians. Both sexes make holes in the gristles of their noses, and in the under-lips, in which they thrust pieces of bone, and are very fond of such kind of ornaments. They mark also and colour their faces with different figures. They barter among one another sea-otters, sea-bears, clothes made of birds-skins and of dried intestines, skins of sea-lions and sea-calves for the coverings of their canoes, wooden masks, darts, thread made of sinews and hair of reindeer.

Their household utensils are square pitchers and large troughs, which they make out of the wood driven ashore by the sea. Their weapons are bows and arrows pointed with flint, and javelins of two yards in

length, which they throw from a small board. In Kamchatka instead of hatchets, they use crooked knives of flint or bone. Some iron knives, hatchets, and lances, were observed among them, which they had probably got by plundering the Russians.

According to the reports of the oldest inhabitants of Umnak and Unalaska, they have never been engaged in any war, either amongst themselves or with their neighbours, except with the people of Alaska, the occasion of which was as follows. The son of the toigon or chief of Umnak had a maimed hand; and some inhabitants of Alaska, who came to visit upon that island, fastened to his arm a drum, out of mockery, and invited him to dance. The parents and relations of the boy were offended at this insult: hence a quarrel ensued; and from that time the people have lived in continual enmity, attacking and plundering each other by turns. According to the reports of the islanders, there are mountains upon Alaska, and woods of great extent at some distance from the coast. The natives wear cloaths made of the skins of reindeer, wolves, and foxes; and are not tributary to any of their neighbours. The inhabitants of the Fox-Islands seem to have no knowledge of any country beyond Alaska, which is one of the most easterly islands yet discovered in these seas, and is probably not far distant from the continent of America.

Festivals are very common among these islanders; and more particularly when the inhabitants of one island are visited by those of the others. The men of the village meet their guests, beating drums, and preceded by the women who sing and dance. At the conclusion of the dance, the hosts invite them to partake of the feasts; after which ceremony, the former return first to their dwellings, place mats in order, and serve up their best provision. The guests next enter, take their places, and, after they are satisfied, the diversions begin. First, the children dance and caper, at the same time making a noise with their small drums, while the owners of the huts of both sexes sing. Next, the men dance almost naked, tripping after one another, and beating drums of a larger size: when these are weary, they are relieved by the women, who dance in their cloaths, the men continuing in the mean time to sing and beat their drums. At last the fire is put out which had been kindled for the ceremony. The manner of obtaining fire is by rubbing two pieces of dry wood against each other, or most commonly by striking two flints together, and letting the sparks fall upon some sea-otter's hair mixed with sulphur. If any forcerer is present, it is then his turn to play his tricks in the dark; if not, the guests immediately retire to their huts, which are made, on that occasion, of their canoes and mats. The natives who have several wives do not withhold them from their guests; but where the owner of the hut has himself but one wife, he then makes the offer of a female servant.

Their hunting-season is principally from the end of October to the beginning of December; during which time they kill great numbers of young sea-bears for their cloathing. They pass all December in feasting and diversions similar to those abovementioned: with this difference, however, that the men dance in wooden masks, representing various sea-animals, and painted red, green, or black, with coarse-coloured earths found

Kamchatka upon these islands.

||  
Karle.

During these festivals, they visit each other from village to village, and from island to island. The feasts concluded, masks and drums are broken to pieces, or deposited in caverns among the rocks, and never afterwards made use of. In spring, they go out to kill old sea-bears, sea-lions, and whales. During summer, and even in winter when it is calm, they row out to sea, and catch cod and other fish. Their hooks are of bone ; and for lines they make use of a string made of a long tenacious sea-weed, which is sometimes found in those seas near 160 yards in length.

Whenever they are wounded in any encounter, or bruised by any accident, they apply a sort of yellow root to the wound, and fast for some time. When their head aches, they open a vein in that part with a stone-lancet. When they want to glue the points of their arrows to the shafts, they strike their nose till it bleeds, and use the blood as glue.

Murder is not punished among them ; for they have no judge. The following ceremonies are used in the burial of the dead. The bodies of poor people are wrapped up in their own cloaths, or in mats ; then laid in a grave, and covered over with earth. The bodies of the rich are put, together with their cloaths and arms, in a small boat made of the wood driven ashore by the sea : this boat is hung upon poles placed crosswise ; and the body is thus left to rot in the open air.

The customs and manners of the inhabitants of the Aleutian isles are nearly similar to those of the inhabitants of the Fox-islands. The former indeed are rendered tributary and entirely subject to Russia ; and most of them have a slight acquaintance with the Russian language, which they have learned from the crews of the different vessels who have landed there.

KANISCA, a very strong town of Lower Hungary, capital of the county of Selawar. It was taken by the imperialists in 1690. It is seated on the river Drave, in E. Long. 17. 37. N. Lat. 46. 23.

KAOLIN, the name of an earth which is used as one of the two ingredients in oriental porcelain. Some of this earth was brought from China, and examined by Mr Reaumur. He found that it was perfectly unfusible by fire, and believed that it was a talky earth ; but Mr Macquer observes, that it is more probably of an argillaceous nature, from its forming a tenacious paste with the other ingredient called *petunse*, which has no tenacity. Mr Bomare says, that by analysing some Chinese kaolin, he found it was a compound earth consisting of clay, to which it owed its tenacity ; of calcareous earth, which gave it a mealy appearance ; of sparkling crystals of mica ; and of small gravel, or particles of quartz crystals. He says, that he has found a similar earth upon a stratum of granite, and conjectures that it may be a decomposed granite. This conjecture is the more probable, as kaolins are frequently found in the neighbourhood of granites. See PORCELAIN.

KAOUTCHOUCK. See CAOUTCHOUC.

KARAT. See CARACT.

KARLE, a Saxon word used in our laws, sometimes simply for a man ; and sometimes, with an addition, for a servant or clown. Thus the Saxons call a

seaman *buscarle*, and a domestic servant *buscarle*. Karmatians From hence comes the modern word *churl*.

KARMATIANS, a sect of Mohammedans who occasioned great disorders in the empire of the Arabs. See BAGDAD, n° 49.

KASTRIL, or KESTRIL. See FALCO.

KAUFFBEUREN, a free and imperial town of Germany, situated in the river Wardach, in E. Long. 10. 53. N. Lat. 47. 57.

KAY, QUAY, or Key. See KEY.

KEBLA, an appellation given by the Mahometans to that part of the world where the temple of Mecca is situated, towards which they are obliged to turn themselves when they pray.

KECKERMAN (Bartholomew), a native of Dantzick, and professor of philosophy there about the beginning of the 17th century, composed systems of almost all the sciences, in which he shews more method than genius.

KEDAR, (anc. geog.), a district in the desert of the Saracens, (so called from *Cedar*, the son of Ishmael, according to Jerome, who in another place says that Kedar was uninhabitable), on the north of Arabia Felix. *Kedareni*, the people ; who dwelt in tents like the other Scenites (Psalm cxx.), were rich in cattle (Isaiah lx.), of a swarthy complexion (Canticles i.), and excellent at the bow (Isaiah xxi.)

KEDES, (anc. geog.), a city of refuge and Levitical in the tribe of Naphtali, on the confines of Tyre and Galilee ; (Josephus). Jerome calls it a sacerdotal city, situated on a mountain 20 miles from Tyre, near Paneas, and called *Gidifus*, taken by the king of Assyria.—Another *Kedes* in the tribe of Issachar, (1 Chron. vii. 72.) which seems to be called *Kifon*, (Joshua xix.)

KEDGE, a small anchor, used to keep a ship steady whilst she rides in a harbour or river, particularly at the turn of the tide, when she might otherwise drive over her principal anchor, and entangle the stock or flukes with her slack-cable, so as to loosen it from the ground. This is accordingly prevented by a kedge-rope that hinders her from approaching it. The kedges are particularly useful in transporting a ship ; i. e. removing her from one part of the harbour to another, by means of ropes which are fastened to these anchors. They are generally furnished with an iron stock, which is easily displaced for the convenience of stowing them.

KEDRON, or CEDRON, (anc. geog.) a town, which, from the defeat and pursuit of the Syrians (1 Macc. xvi.) appears to have stood on the road which led from the Higher India to Azotus : in this war it was burnt by the Jews.

KEDRON, or *Cedron*, (anc. geog.) St John calls it a brook, but Josephus a deep valley, between Jerusalem and mount Olivet to the east ; called also *Kedron*, from its blackness. A brook only in winter, or in rainy weather, according to Maundrel.

KEEL, the principal piece of timber in a ship, which is usually first laid on the blocks in building. If we compare the carcass of a ship to the skeleton of the human body, the keel may be considered as the back-bone, and the timbers as the ribs. It therefore supports and unites the whole fabric, since the stem and

Keel,  
Keelson.

and stern-post, which are elevated on its ends, are, in some measure, a continuation of the keel, and serve to connect and inclose the extremities of the sides by transoms; as the keel forms and unites the bottom by timbers.

The keel is generally composed of several thick pieces placed lengthways, which, after being scarfed together, are bolted, and clenched upon the upper side. When these pieces cannot be procured large enough to afford a sufficient depth to the keel, there is a strong thick piece of timber bolted to the bottom thereof, called the *false keel*, which is also very useful in preserving the lower side of the main keel. In our largest ships of war, the false keel is generally composed of two pieces, which are called the *upper* and the *lower false keels*. See *MIDSHIP-FRAME*.

The lowest plank in a ship's bottom, called the *garboard-break*, has its inner-edge let into a groove or channel, cut longitudinally on the side of the keel: the depth of this channel is therefore regulated by the thickness of the garboard-break.

KEEL is also a name given to a low flat-bottomed vessel, used in the river Tyne to bring the coals down from Newcastle and the adjacent parts, in order to load the colliers for transportation.

KEEL-Hauling, a punishment inflicted for various offences in the Dutch navy. It is performed by plunging the delinquent repeatedly under the ship's bottom on one side, and hoisting him up on the other, after having passed under the keel. The blocks, or pulleys, by which he is suspended, are fastened to the opposite extremities of the main-yard, and a weight of lead or iron is hung upon his legs, to sink him to a competent depth. By this apparatus he is drawn close up to the yard-arm, and thence let fall suddenly into the sea, where, passing under the ship's bottom, he is hoisted up on the opposite side of the vessel. As this extraordinary sentence is executed with a serenity of temper peculiar to the Dutch, the culprit is allowed sufficient intervals to recover the sense of pain, of which indeed he is frequently deprived during the operation. In truth, a temporary insensibility to his sufferings ought by no means to be construed into a disrespect of his judges, when we consider that this punishment is supposed to have peculiar propriety in the depth of winter, whilst the flakes of ice are floating on the stream; and that it is continued till the culprit is almost suffocated for want of air, benumbed with the cold of the water, or stunned with the blows his head receives by striking the ship's bottom.

KEELSON, a piece of timber which may be properly defined the interior or counter-part of the keel, as it is laid upon the middle of the floor-timbers, immediately over the keel, and, like it, composed of several pieces scarfed together. In order to fit with more security upon the floor-timbers and crotches, it is notched about an inch and a half deep, opposite to each of those pieces, and thereby firmly scored down upon them to that depth, where it is secured by spike-nails. The pieces of which it is formed are only half the breadth and thickness of those of the keel.

The keelson serves to bind and unite the floor-timbers to the keel. It is confined to the keel by long bolts,

which, being driven from without through several of the timbers, are fore-locked or clenched upon rings on the upper-side of the keelson.

Keeper,  
Keill,

KEEPER of the *Great Seal*, is a lord by his office, and styled *lord keeper of the great seal of Great Britain*; he is always one of the privy-council. All grants, charters and commissions of the king under the great seal, pass through the hands of the lord-keeper: for, without that seal, many of those grants, &c. would be of no force; the king being, in the interpretation of the law, a corporation, and therefore passes nothing but by the great seal, which is also said to be the public faith of the kingdom, being in the highest esteem and reputation.

Whenever there is a lord-keeper, he is invested with the same place, authority, pre-eminence, jurisdiction, or execution of laws, as the lord-chancellor of Great-Britain is vested with.

The lord-keeper is constituted by the delivery of the great seal, &c.

KEEPER of the *Privy-seal*, is also a lord by his office, through whose hands all grants, pardons, &c. pass before they come to the great seal; and even some things pass his hands which do not pass the great seal at all. This officer is also one of the privy-council, yet was anciently called *clerk of the privy-seal*. His duty is to put the seal to no grant, &c. without a proper warrant; nor with warrant where it is against law, or inconvenient, but shall first acquaint the king therewith.

KEIL, a very important fortress of Germany, seated on the banks of the Rhine, built by the French after a design of marshal Vauban, for the defence of Strasburg. It was ceded to the empire in 1697, by the treaty of Ryfwick. The French retook it in 1703, and it was restored to the empire by the treaty of Rastadt. E. Long. 7. 45. N. Lat. 48. 40.

KEILL (Dr John), a celebrated astronomer and mathematician, was born at Edinburgh in 1671, and studied in the university of that city. In 1694 he went to Oxford; where, being admitted of Balliol-college, he began to read lectures according to the Newtonian system in his private chamber in that college. He is said to have been the first who taught Sir Isaac Newton's principles by the experiments on which they are founded: and thus, it seems, he did by an apparatus of instruments of his own providing, by which means he acquired a great reputation in the university. The first specimen he gave the public of his skill in mathematical and philosophical knowledge, was his *Examination of Dr Burnet's theory of the earth*, with *Remarks on Mr Whiston's theory*: and these theories being defended by their respective inventors, drew from Mr Keill *An examination of the reflections on the theory of the earth*, together with *A defence of the remarks on Mr Whiston's new theory*. In 1701, he published his celebrated treatise, intitled, *Introductio ad veram physicam*, which only contains 14 lectures; but in the following editions he added two more. This work has been translated into English, under the title of *An introduction to natural philosophy*. Afterwards, being made fellow of the Royal Society, he published, in the Philosophical Transactions, a paper of the laws of attraction; and being offended at a passage in the *Acta eruditum* of Leipzig, warmly vindicated, against

Mr.



Keill  
||  
Keith.

Mr Leibnitz, Sir Isaac Newton's right to the honour of the first invention of his method of fluxions. In 1709 he went to New-England, as treasurer of the Palatines. About the year 1711, several objections being urged against Sir Isaac Newton's philosophy, in support of Des Cartes's notions of a plenum, Mr Keill published a paper in the Philosophical Transactions on the rarity of matter, and the tenuity of its composition. But, while he was engaged in this dispute, queen Anne was pleased to appoint him her deceiver; and he continued in that place under king George I. till the year 1716. He had also the degree of doctor of physic conferred on him by the university of Oxford, in 1713. He died in 1721. He published, besides the works already mentioned, *Introductio ad veram astronomiam*, which was translated into English by Dr Keill himself; and an edition of Commandinus's Euclid, with additions of his own.

KEILL (James), M. D. an eminent physician, and brother of the former, was born in Scotland, about the year 1673; and having travelled abroad, read lectures of anatomy with great applause in the universities of Oxford and Cambridge, by the latter of which he had the degree of doctor of physic conferred upon him. In 1700 he settled at Northampton, where he had considerable practice as a physician; and died there of a cancer in the mouth, in 1719. He published, 1. An English translation of Lemery's chemistry. 2. An account of animal secretion, the quantity of blood in the human body, and muscular motion. 3. A treatise on anatomy. 4. Several pieces in the Philosophical Transactions.

KEISERSBERG, a town of Alsace in France, and in the bailiwick of Haguenau, which has belonged to the French ever since the year 1548. It is seated in a pleasant country, in E. Long. 7. 25. N. Lat. 48. 10.

KEISERSLAUERN, a town of Germany, in the Lower Palatinate, belonging to the elector Palatine; seated on the river Louter, in E. Long. 7. 51. N. Lat. 49. 22.

KEISERTOUL, a town of Switzerland, in the county of Baden, with a bridge over the Rhine, and a castle. It belongs to the bishop of Constance, and is situated in E. Long. 8. 40. N. Lat. 47. 10.

KEISERWERT, a town of Germany in the circle of Westphalia, the diocese of Cologne, and the duchy of Berg; subject to the elector Palatine. The fortifications are demolished. It is seated on the Rhine, in E. Long. 6. 49. N. Lat. 51. 16.

KEITH (James), field-marshal in the Prussian service, was the younger son of William Keith, earl-marshal of Scotland; and was born in 1696. He was designed by his friends for the law; but his inclination led to arms, and the first occasion of drawing his sword was rather an unhappy one. When he was 18 years old, the rebellion broke out in Scotland; and, through the instigation of his mother, he joined James's party: he was wounded at the battle of Sheriff-muir, and made his escape to France. Here he applied himself to military studies; and going to Madrid, he by the interest of the duke of Liria obtained a commission in the Irish brigades, then commanded by the duke of Ormond. He afterwards at-

tended the duke of Liria when he went ambassador to Muscovy; and, being by him recommended to the czarina, was promoted to the rank of lieutenant-general, and invested with the order of the black eagle. He distinguished himself by his valour and conduct in the Russian service, and had no inconsiderable share in the revolution that raised Elizabeth the daughter of Peter the Great to the throne: he also served in several embassies; but finding the honours of that country but a splendid kind of slavery, he left that court, and entered the Prussian service. The king of Prussia made him field-marshal of the Prussian armies, and governor of Berlin; and distinguished him so far by his confidence, as to travel in disguise with him over a great part of Germany, Poland, and Hungary. In business, he made him his chief counsellor; in his diversions, his chief companion. The king was much pleased with an amusement which the marshal invented in imitation of the game of chess. The marshal ordered several thousand small statues of men in armour to be cast by a foundry; these he would set opposite to each other, and range them in battalia, in the same manner as if he had been drawing up an army; he would bring out a party from the wings or centre, and shew the advantage or disadvantage resulting from the different draughts which he made. In this manner the king and the marshal often amused themselves, and at the same time improved their military knowledge. This brave and experienced general, after many important services in the late wars of that illustrious monarch, was killed in the unfortunate affair of Hohenkerken, in the year 1758.

KELLINGTON, or KILRHAMPTON, a town of Cornwall in England, which sends two members to parliament. W. Long. 4. 38. N. Lat. 50. 36.

KELP, in the glass-trade, a term used for a sort of potashes made use of in many of the glass-works, particularly for the green glass. It is the calcined ashes of a plant called by the same name; and in some places, of sea-thongs or laces, a sort of thick-leaved fucus or sea-wrack\*. This plant is thrown on the rocks and shores in great abundance, and in the summer months is raked together and dried as hay in the sun and wind, and afterwards burnt to the ashes called *kelp*.

KELSO, a town of Roxburghshire in Scotland, pleasantly situated on the river Tweed, in W. Long. 1. 20. N. Lat. 55. 38. Of this town Mr Pennant gives the following description. "It is built much after the manner of a Flemish town, with a square and town-house. It contains about 2700 souls, has a very considerable market, and great quantities of corn are fold here weekly by sample. The parish-church is darksome and inconvenient, being part of that belonging to the abbey; but a new one is building, in an octagonal form, 82 feet in diameter, supported by a circle of pillars.

"The abbey of Tyronensians was a vast pile, and, to judge by the remains, of venerable magnificence. The walls are ornamented with false round arches, intersecting each other. Such interfections form a true Gothic arch; and may as probably have given rise to that mode, as the arched shades of avenues. The steeple of the church is a vast tower. This house was founded by David I. when earl of Cumberland. He first

Kellington  
||  
Kelso.

\* See  
Fucus, in  
the AP-  
PENDIX.

Kelfo,  
Kempis.

Kempton  
Kendal.

first placed it at Selkirk, then removed it to Roxburgh, and finally, when he came to the crown, fixed it here in 1128. Its revenues were, in money, above 2000 l. Scots a-year. The abbot was allowed to wear a mitre and pontifical robes; to be exempt from episcopal jurisdiction, and permitted to be present at all general councils.

"The environs of Kelfo are very fine: the lands consist of gentle risings, inclosed with hedges, and extremely fertile. They have much reason to boast of their prospects. From the Chalkheugh is a fine view of the forks of the rivers, Roxburgh-hill, Sir John Douglas's neat feat, and, at a distance, Fleurus; and from Pinnacle-hill is seen a vast extent of country, highly cultivated, watered with long reaches of the Tweed, well wooded on each margin. These borders ventured on cultivation much earlier than those on the west or east, and have made great progress in every species of rural economy. Turnips and cabbages, for the use of cattle, cover many large tracts; and potatoes appear in vast fields. - Much wheat is raised in the neighbourhood, part of which is sent up the frith of Forth, and part into England.

"The fleeces here are very fine, and sell from 12 to 14 shillings the stone of 24 lb. and the picked kind from 18 to 20. The wool is sent into Yorkshire, to Linlithgow, or into Aberdeenshire, for the stocking manufacture; and some is woven here into a cloth, called *plains*, and sold into England to be dressed. Here is also a considerable manufacture of white leather, chiefly to supply the capital of Scotland.

"From what I can collect, the country is greatly depopulated. In the reign of James VI. or a little before the Union, it is said that this county could send out 15,000 fighting men: at present it could not raise 3000. But plundering in those times was the trade of the borderers, which might occasion the multitude of inhabitants."

Over the Tweed at Kelfo is a fine stone bridge of six arches: but the river does not in this place divide the kingdoms of Scotland and England from each other; for the Scots possess the country for several miles to the southward.

KEMPIS (Thomas à), a pious and learned regular canon, was born at the village of Kemp, in the diocese of Cologne, in 1380; and took his name from that village. He performed his studies at Deventer, in the community of poor scholars established by Gerard Groot; and there made a great progress in the sciences. In 1399, he entered the monastery of the regular canons of Mount St Agnes, near Zwol, of which his brother was prior. Thomas à Kempis there distinguished himself by his eminent piety, his respect for his superiors, his charity to his brother canons, and his continual application to labour and prayer. He died in 1471, aged 70. The best editions of his works, which consist of sermons, spiritual treatises, and lives of holy men, are those of Paris, in 1549, and of Antwerp, in 1607. The famous and well-known book *De Imitatione Christi*, which has been translated into almost all the languages of the world, though it has almost always been numbered among the works of Thomas à Kempis, is also found printed under the name of *Gerfon*; and on the credit of some MSS. has been since ascribed to the abbot Gerfon of the order of St Benedict. This has occasioned a violent dispute between the canons of St Augustine and the Benedictines: but while devout Christians find spiritual comfort in the work, the name of the writer is of small importance.

KEMPTEN, a free and imperial town of Germany, in Lower Suabia, and in Algow, and also in the territory of the abbot of Kempton, who is a prince of the empire, and has a voice in the diet. The inhabitants are Protestants; and it has been several times taken, but has always recovered its liberty. It is seated on the river Iller. E. Long. 10. 33. N. Lat. 47. 47.

KEMPTEN, a territory in the circle of Suabia, in Germany, between the bishopric of Augsburg, and the barony of Walburg. It is about 17 miles long and broad; and has no considerable place but the towns of Kempton and Kauffbeuren, which are imperial.

KEN (Thomas), an eminent English bishop in the 17th century, was bred at Winchester school, whence he went to Oxford; and in 1669, was made a prebend of Winchester. In 1675, the year of the jubilee, he travelled to Rome; and used to say, He had reason to give God thanks for his travels, having returned more confirmed of the purity of the reformed religion than he was before. He was appointed by king Charles II. to attend the lord Dartmouth at the demolishing of Tangier; and at his return was made chaplain to his majesty, as he was some time after to the prince of Orange, then residing in Holland. In 1685, he was consecrated bishop of Bath and Wells. The month following he attended king Charles II. at his death; and gave close attendance at the royal bed for three whole days and nights, watching proper intervals to suggest pious and proper thoughts on so serious an occasion. In the following reign he zealously opposed the progress of Popery; and in June 1688, he, with five other bishops and the archbishop of Canterbury, was committed prisoner to the Tower of London for subscribing a petition to his majesty against the declaration of indulgence. Upon the Revolution, however, he refused to take the oaths to king William and Queen Mary, on which account he was deprived of his bishopric. Her majesty queen Anne bestowed on him a yearly pension of 200 l. to his death in 1710. He published several pious books. His charity was so great, that when he was bishop of Bath and Wells, having received a fine of 4000 l. he gave a great part of it to the French Protestants.

KENDAL, a town of Westmoreland, seated in a valley, among hills, on the west side of the river Can or Ken, over which there are two stone bridges, and one of wood, which leads to the castle, now in ruins. It is a large handsome place; and has two long streets, which cross each other. The church is a spacious structure, supported by five rows of pillars, and 12 chapels of ease belonging to it. The free-school stands on the side of the church-yard; and is well endowed, having exhibitions to Queen's-college in Oxford. It is noted for its manufactures of cotton, druggets, hats, and stockings.—The castle is remarkable for being the birth-place of Catharine Par, the last wife of Henry VIII. The different branches of the woollen manufacture were established here by certain Flemings as far back as the reign of Edward III. who encouraged them to settle both at Kendal and Colchester. W. Long. 2. 40.

Kenks,  
Kennel.

N. Lat. 54. 15.

**KENKS**, in the sea-language, doublings in a rope or cable, when handed in and out, so that it does not run easy; or when any rope makes turns or twists, and does not run free in the block, then it is said to make kenks.

**KENNEL**, a place or little house for hounds; and, in a metaphorical sense, used for the pack of hounds itself. To make a complete kennel, three conveniences ought to be observed, *viz.* a sweet air, fresh water, and the morning-sun; for which the following rules may be instructive.—The court should be large; for the more spacious it is, the better it will be for the hounds to refresh themselves in: and it should be well walled, or fenced about, to prevent their getting out, but not so high as to keep out the sun or wind. The water, if possible, should run through some part of the court or yard; or, for want thereof, have a well with a stone trough about a foot and a half high, always kept with fresh water, to the end the hounds may drink when they please; and at one end of the trough there must be a hole to let out the water for cleansing it. Let the kennel be built in the highest part of the court, in which there should be two rooms, one of which should be larger than the other, with a large chimney to make a fire when need requires. This room should be raised about three feet from the ground, and in the floor there should be two gutters for the conveyance of the urine. There must be dispersed up and down small bedsteads raised a foot from the floor, with holes pierced through the planks for drawing away their urine. The other room must be for the huntsman to keep his poles, whips, salves, and the like necessities; there should also be a copper for the boiling, dressing, and ordering of their food, when they come home wet and weary. Be careful not to give them any drink in vessels of copper; and as to the proportion and quality of allowance for food, it must be ordered with relation to the nature of the hounds and their sizes: three bushels of oats, with a bushel and a half of wheat-bran, will serve ten couple and a half of middling-sized hounds a week, giving them sometimes beef broth, whey, slipt-milk, chippings of bread, bones, and sometimes a little horse-flesh; for change of food creates a good appetite, and preserves health. The oats and wheat-bran must be boiled and thickened with milk and butter-milk, with some chippings, or some broken meat boiled therein. With regard to horse-flesh, those best skilled this way, think, of all their foods (provided it be given with discretion), horse-flesh the best, and hottest. As for dogs that are accustomed to hunt the hare, it is not good to give them any meat, because it is said to with-draw their scent or affections from the chase, as their flesh is not very sweet, nor their scent very strong. If the huntsman perceives, that through long and frequent chases the hounds fall away, he must be more careful in feeding and cherishing them with some good broth of boiled oxen or sheep hearts. On such days as the hounds do not hunt, the best times to feed them are early, before sun-rising, and late in the evening, after sun-set; and on the days they hunt, they ought to be rewarded as they come home, be it when it will, with a good supper; for nothing is a greater discouragement to a hound than to

go to sleep with an empty belly after hard labour. If you have more dead flesh than you have present occasion for, it may be preserved a week or ten days sweet, by burying it under ground.

**To KENNEL**, a term applied by fox-hunters to a fox when he lies in his hole.

**KENNET** (Dr White), a learned English writer and bishop of Peterborough, in the 18th century, bred at St Edmund-hall, Oxford; where he soon distinguished himself by his vigorous application to his studies, and by his translations of several books into English, and other pieces which he published. In 1695, our author published his *Parochial Antiquities*. A sermon preached by him on the 30th of January 1703, at Aldgate, exposed him to great clamour. It was printed under the title of *A compassionate inquiry into the causes of the civil war*. In 1706, he published his *Cate of Impropriations*, and two other tracts on the same subject. In 1706, he published the third volume of *The Complete History of England*, (the two former volumes compiled by Mr Hughes). In 1709, he published *A Vindication of the Church and Clergy of England from some late reproaches rudely and unjustly cast upon them*; and *A true Answer to Dr Sacheverell's Sermon*. When the great point in Dr Sacheverell's trial, the change of the ministry, was gained, and very strange addresses were made upon it, there was to be an artful address from the bishop and clergy of London, and they who would not subscribe it were to be represented as enemies to the queen and the ministry. Dr Kennet fell under this imputation. He was exposed to great odium as a low-church man, on account of his conduct and writings. When he was dean of Peterborough, a very uncommon method was taken to expose him by Dr Walton, rector of the church of White chapel: for in the altar-piece of that church, which was intended for a representation of Christ and his 12 apostles eating the passover and last supper, Judas the traitor was drawn sitting in an elbow-chair, dressed in a black garment, with a great deal of the air of Dr Kennet's face. It was generally said, that the original sketch was for a bishop under Dr Walton's displeasure; but the painter being apprehensive of an action of *Scandalum Magnatum*, leave was given to drop the bishop, and make the dean. This giving general offence, upon the complaint of others (for Dr Kennet never saw it, or seemed to regard it), the bishop of London ordered the picture to be taken down. In 1713, he presented the society for propagating the gospel with a great number of books, suitable to their design; published his *Bibliotheca Americana Primordia*, and founded an antiquarian and historical library at Peterborough. In 1715, he published a sermon, intitled, *The Witchcraft of the present Rebellion*, and afterward several other pieces. In 1717, he was engaged in a dispute with Dr William Nicholson, bishop of Carlisle, relating to some alterations in the bishop of Bangor's famous sermon; and disliked the proceedings of the convocation against that bishop. Upon the death of Dr Cumberland bishop of Peterborough, he was promoted to that see, to which he was consecrated in 1718. He sat in it more than ten years, and died in 1728. He was an excellent philologist, a good preacher, whether in English or Latin,

Kennet.



Kennet,  
Kent.

tin, and well versed in the histories and antiquities of our nation.

KENNET (Basil), a learned English writer, and brother to the preceding, was educated in Corpus Christi college in the university of Oxford, where he became fellow. In 1706, he went over chaplain to the English factory at Leghorn; where he met with great opposition from the Papists, and was in danger from the inquisition. He died in the year 1714. He published *Lives of the Greek Poets*; the *Roman Antiquities*; a volume of *Sermons* preached at Leghorn; A translation into English of Puffendorf's *Treatise of the Law of Nature and Nations*. He was a man of most exemplary integrity, generosity, piety, and modesty.

KENT, one of the counties of England, situated at the south-east corner of the island, and from thence enjoying many advantages. The capacious estuary of the Thames washes its northern parts, as the sea does the south-east; whence some, with no great impropriety, have styled it a *peninsula*. In point of extent, this is the fifthshire in South Britain, little less in its dimensions than the province of Holland; larger in size than the duchy of Juliers in Germany; and almost exactly equal to that of Modena in Italy. Kent is, with great appearance of truth, supposed to be so styled from the ancient British word *kant*, signifying a *corner*, or, when applied to a country, an *head-land*. It is certain, that the Romans bestowed the name of *Cantium* on the province, and on its most conspicuous promontory the north Foreland; and, from the district they inhabited, the people were called *Cantii*; which has prevailed even to our times, when *Kent*, and *the men of Kent*, are the common appellatives. It is however, probable, that these *Cantii* were not the original inhabitants, but a latter colony from the opposite continent, established here, like the Belgæ, not long before the Roman invasion. At the time of Cæsar's coming, this spacious and fertile region was divided into four principalities, or, as they are, according to the manners of those days, commonly called, *kingdoms*. It was his observation of these people, that they were particularly distinguished by their civility and politeness; a character which their descendants have preserved. When that wise people became masters of the southern parts of the island, this province received the most conspicuous marks of their attention, as appears from the stations which they so prudently established, while their government flourished in its full vigour. The care they took of the ports on the sea-coast as soon as it came to be in danger, and the several fortresses which they erected for the defence of their subjects against the sudden attempts of barbarous invaders, are evidences of the same kind. These sorts, so prudently disposed, and so well secured, were under the direction of a particular great officer, called *Littoris Saxonici Comes*, i.e. the Count of the Saxon shore; which office seems to have been preserved by the British monarchs who governed here, after the Romans quitted the isle. The Saxon kings of Kent discharged this trust in their regal capacity, from the middle of the fifth to the beginning of the ninth century. Under the northern princes, this post was again revived, though with a change of title, in the *Lord Warden of the Cinque Ports*. Indeed, under all governments, the people of Kent have been especially confi-

dered; as appears from their claim to the post of honour in our land-armies, and the privileges granted to their havens, in consideration of their undertaking the defence of our channel.

As to the climate of this county, it varies, according to the situation of places. In the low flat lands, and especially in the marshes, the air is heavy, moist, and unhealthy; and yet not to such a degree as it has been sometimes represented; for, with a little care and caution, strangers, as well as natives, quickly reconcile their constitutions to the temperature even of these parts, and live in them without much inconvenience or apparent danger. But, in reference to the rest of the county, the air is as thin, pure, and wholesome, as in any part of Britain. There is no region more happily or more beautifully diversified in regard to soil, so that every kind thereof is, somewhere or other, to be met with in its bounds; and in noshire are any of these soils more fertile than they are in this. The Weald yields variety of fine timber, particularly of chefnut; the middle part has very rich arable land, annually bearing every species of grain in immense plenty, and these excellent in their several sorts. There are also many beautiful orchards, which produce a variety of fine fruits, and more especially apples and cherries, which were introduced here from Flanders, by one Richard Harris, who was the king's fruiterer, in the reign of Henry VIII. The flat country is renowned for its meadows; and Rumney-marsh has hardly its equal. We may, from this concise description, very easily collect, that the natural products of Kent are numerous, and of great value. In the bowels of the earth they find, in several places, a rough hard serviceable stone for paving, which turns to some advantage; but not so much as their exquisite fullers-earth, rich marl, and fine chalk, which are there in abundance. If we except iron ore, indeed, they have no mines; but there are prodigious heaps of copperas-stones thrown on the coast. The isle of Sheppey, and all the adjacent shore as far as Reculver, is justly famous for its wheat. Thanet is in no less credit for its barley, or rather was so; for now it produces, thro' the painful industry and skilful husbandry of its inhabitants, copious crops of good wheat as well as barley. Horses, black cattle, and sheep, they have in great numbers, and remarkable in point of size; and hop-grounds in all parts of the county, which turn to very considerable account. To which we may add, weld, or, as some call it, *dyers-weed*, which is a very profitable commodity, and of which there grows much in the neighbourhood of Canterbury; also madder, which is, or has been, occasionally cultivated. The rivers and sea-coasts abound with fish of different kinds. The excellency of its oysters on the eastern shore, is celebrated by the Roman poets. Those of Feverham and Milton are not only in great esteem at the London market, but are likewise sent in great quantities to Holland.

The many rich commodities produced in this county, is the reason why most of our writers have represented it as in a manner void of manufactures; which, however, as appears upon a strict and impartial examination, is very far from being the case. Of iron-works there were anciently many; and there are still some, where kettles, bombs, bullets, cannon, and such like,

Campbell's  
Political  
Survey.

Kent.

Kent.

are made. At Deptford, Sir Nicholas Crispe had, in his life-time, a very famous copperas work; as, indeed, there that ingenious gentleman, one of the greatest improvers and one of the most public-spirited persons this nation ever bred, introduced several other inventions. Copperas was also formerly made, together with brimstone, in the life of Shepey \*. But the original, and for many ages the principal manufacture of this county, was broad cloth of different colours, established chiefly at Cranbrook by king Edward III. who brought over Flemings to improve and perfect (the trade being introduced long before) his subjects in that important art. At this, and other places, it flourished so much, that even at the close of queen Elizabeth's reign, and, according to some accounts, much later, the best for home consumption, and the largest quantities for exportation, were wrought here; many fulling-mills being erected upon almost every river, and the greatest plenty of excellent fullers-earth affording them singular assistance; inasmuch, that it is still a tradition, that the yeomenry of this county, for which it has been ever famous, were mostly the descendants of rich clothiers, who laid out the money acquired by their industry in the purchase of lands, which they transmitted, with their free and independent spirit, to their posterity. The Duke of Alva's persecution of the Protestants in the Low Countries, drove a multitude of Walloons over hither, who brought with them that ingenuity and application for which they had been always distinguished. These diligent and active people settled a manufactory of flannel or baize at Sandwich. By them the silk-looms were set up at Canterbury, where they still subsist; and they also introduced the making of thread at Maidstone, where it yet remains, and merits more notice and encouragement than hitherto it has met with.

Upon the river Dart, at the confluence of which with the Thames stands the town of Dartford, was set up, in the reign of queen Elizabeth, the first mill for making white paper, by Mr John Spilman, a German, upon whom, long after, king James conferred the honour of knighthood; but king Charles more sensibly bestowed upon this Sir John Spilman a patent, and a pension of 200 l. a-year, as a reward of his invention, and for the support of the manufacture. About the year 1590, Godfrey Box, a German, erected upon the same river the first slitting-mill which was ever used for making iron-wire; and also the first battery-mill for making copper-plates. Other new inventions, requiring the assistance of water, have been set up on other streams; and a great variety of machines of this sort still subsist in different parts of this county. But these things are now so common, that it would be both tedious and useless to insist upon them. Amongst these, we may reckon the making gunpowder in several places. That manufacture, however, which is now the glory of this county, and indeed of Britain, is ship-building; more especially at the royal yards; as at Woolwich, which was settled by Henry VIII. and some considerable ships built there. At present, there is not only a most complete establishment for the building and equipping men of war, a rope-walk, foundry, and magazines; but also many private docks, in which prodigious business is carried on, and multitudes of people employed.

\* Philosoph.  
Transact.  
No. xlii.  
p. 1056--  
1059.

KEPLER (John), one of the greatest astronomers of his age, was born at Wied, in the country of Wirtemberg, in 1571. In the year 1595, he wrote an excellent book, which was printed at Tubingen the year following, under the title of *Prodromus dissertationum de proportionibus orbium celestium, deque causis eorum numerum, magnitudinis, motuumque periodicorum generis et propriis*, &c. Tycho Brahe having settled in Bohemia, and obtained from the emperor all sorts of conveniences for the perfecting of astronomy, was so passionately desirous of having Kepler with him, and wrote so many letters to him on that subject, that he prevailed upon him to leave the university of Gratz, and remove into Bohemia with his family and library, in the year 1600. Kepler in his journey was seized so violently with the quartan ague, that he could not do Tycho Brahe all the services of which he was before capable. He was even a little dissatisfied with the reservedness which Tycho Brahe shewed towards him; for the latter did not communicate to him all he knew; and as he died in 1601, he did not give time to Kepler to be very useful to him, or to receive any considerable advantage under him. From that time Kepler enjoyed the title of *Mathematician to the emperor*, all his life; and gained more and more reputation by his works. The emperor Rodolphus ordered him to finish the tables of Tycho Brahe, which were to be called the *Rodolphine Tables*. Kepler applied himself to it vigorously; but unhappy are those learned men who depend upon the good-humour of the intendants of the finances. The treasurers were so ill-affected toward our author, that he could not publish these tables till 1627. He died at Ratibon, where he was soliciting the payment of the arrears of his pension in 1630.

The principal works of this great astronomer are, 1. *Prodromus dissertationum*, above mentioned, to which he has also given the title of *Mysterium Cosmographicum*; which he esteemed more than any other of his works, and was for some time so charmed with it, that he said he would not give up the honour of having invented what was contained in that book for the electorate of Saxony. 2. *Harmonia mundi*, with a defence of that treatise. 3. *De cometis, libri tres*. 4. *Epitome astronomie Copernicanae*. 5. *Astronomia nova*. 6. *Chilias logarithmorum*, &c. 7. *Novo stereometria solidorum vinariorum*, &c. 8. *Dioptrice*. 9. *De vero natali anno Christi*. 10. *Ad Vitellionem Paralipomena*, quibus *Astronomia pars optica traditur*, &c. 11. *Somnium Lunaris Astronomia*; in which he began to draw up that system of comparative astronomy which was afterwards pursued by Kircher, Huygens, and Gregory. His death happened while the work was printing: upon which James Bartschius, his son-in-law, undertook the care of the impression; but was also interrupted by death: and Lewis Kepler his son, who was then a physician at Konigsberg in Prussia, was so much startled at these disasters, that it was with the utmost difficulty he could be prevailed upon to attempt to finish it, lest it should prove fatal to him: he completed the task, however, without receiving any personal injury.

KERCKRING (Theodore), a famous physician of the 17th century, was born at Amsterdam, and acquired a great reputation by his discoveries and his works.

Kepler,  
Kerckring



Kerman,  
Kermes.

Kermes.

works. He found out the secret of softening amber without depriving it of its transparency; and made use of it in covering the bodies of curious insects, in order to preserve them. He was a member of the Royal Society of London; and died in 1693 at Hamburg, where he had spent the greatest part of his life, with the title of *resident of the grand duke of Tuscany*. His principal works are, 1. *Spicilegium anatomicum*. 2. *Anthropogenia ichnographia*. There is also attributed to him an anatomical work, printed in 1671, in folio.

KERMAN, the capital city of a province of that name in Persia, seated in E. Long. 56. 30. N. Lat. 30. 0. The province lies in the fourth part of Persia, on the Persian gulph. The sheep of this country, towards the latter end of the spring, shed their wool, and become as naked as suckling pigs. The principal revenue of the province consists in these fleeces.

KERMES, in zoology, the name of an insect produced in the excrements of a species of the oak.

*Kermes*, among the Arabians, signifies a small worm; and *κέρκρος* among the Greeks, whence the Latin word *coccum*, both which mean a kernel or grain; for which reason, among the later Greeks, instead of the word *κέρκρος*, the word *κέρματι*, a *quorm*, is substituted; for these grains are full of small worms, the juice of which affords the scarlet colour and dye. Hence the worm is taken for the grain itself.

The kermes appears at first wrapped up in a membranaceous bladder, of the size of a pea, smooth and shining, of a brownish red colour, and covered with a very fine ash-coloured powder. This bag teems with a number of reddish eggs or insects, which, being rubbed with the fingers, pour out a crimson liquor. It is only met with in warm countries in the months of May and June. In the month of April this insect becomes of the size and shape of a pea; and its eggs some time after burst from the womb, and, soon turning into worms, run about the branches and leaves of the tree. They are of two sexes, and the females have been hitherto described: but the males are very different from the former; and are a sort of small flies like gnats, with six feet, of which the four forward are short, and the two backward long; divided into four joints, and armed with three crooked nails. There are two feelers on the head, a line and a half long, which are moveable, streaked, and articulated. The tail at the back part of the body is half a line long, and forked. The whole body is covered with two transparent wings, and they leap about in the manner of bees. The harvest of the kermes is greater or less in proportion to the severity of the winter. The women gather them before sun-rising, tearing them off with their nails, for fear there should be any loss from the hatching of the insects. They sprinkle them with vinegar, and lay them in the sun to dry, where they acquire a red colour.

KERMES *Mineral*, so called from its colour, which resembles that of vegetable kermes, is one of the most important antimonial preparations, both with regard to its chemical phenomena and to its medicinal uses.

The use of kermes-mineral was not established in medicine before the beginning of this century. Some chemists, indeed, amongst others Glauber and Lemer,

had before that time mentioned in their works several preparations of antimony which approach more or less to kermes; but these preparations being little known, were confounded with many others which are entirely neglected, although much praised by their authors.—The fame of kermes was occasioned by friar Simon, apothecary to the Chartreux friars. He received this preparation from a surgeon called *La Ligerie*, who had procured it from a German apothecary who had been a scholar of the famous Glauber. Friar Simon, from the commendations given to this new remedy by *La Ligerie*, administered it to a Chartreux friar, who was dangerously ill of a violent peripneumony, by which the friar was suddenly, and as it had been miraculously, cured. From that time the friar-apothecary published the virtue of his remedy. Several other remarkable cures were performed by means of kermes. The public believed in its medicinal qualities, and called it *powder of Chartreux*; because it was prepared only in the apothecary's shop belonging to these monks. The reputation of kermes extended itself more and more; till at length the duke of Orleans, then regent of France, procured the publication of the process by *La Ligerie*.

This process consists in boiling, during two hours, pulverised crude antimony in the fourth part of its weight of the liquor of nitre fixed by coals, and twice its weight of pure water: at the end of this time the liquor is to be decanted and filtrated, while boiling, through brown paper. It continues clear while it is boiling hot; but when it cools, it becomes turbid, acquires a red brick colour, and again becomes clear by the deposition of a red sediment, which is the kermes. The boiling may be thrice repeated, and each time the same quantity of water is to be added to the antimony, and a fourth part less of the liquor of fixed nitre. The several sediments from these three boilings are to be added together, washed with clean water till the water acquires no taste; and the kermes is then to be dried. *La Ligerie* directs, that aquavivæ shall be once or twice poured upon it and burnt, and the kermes dried again.

We now proceed to explain the nature of kermes, and the phenomena of its preparation.—Crude antimony is composed of regulus of antimony and common sulphur, united naturally with each other, as in almost all metallic minerals. The fixed alkali with which the crude antimony is boiled, although it is diluted with much water, acts upon the sulphur of the antimony, and forms with it liver of sulphur; and as this compound is a solvent of all metallic matters, it dissolves a certain quantity of the regulus of antimony. In this operation then a combination is formed of fixed alkali, of sulphur, and of regulus of antimony. Of these three substances the fixed alkali only is soluble in water, and is the intermediate substance by which the sulphur and regulus are suspended in the water. But we are to observe, that the alkali becomes impregnated by this operation, and by boiling, with a larger quantity of regulus, and especially of sulphur, than can be suspended in cold water; hence the decoction of kermes, which is clear, limpid, and colourless while boiling hot, becomes turbid and deposits a sediment while it cools.

This

**Kermes.** This compound, therefore, like certain salts, may be kept dissolved in larger quantity by hot than by cold water, and much of it is therefore deposited by cooling.

Further, while the kermes is precipitating, the whole antimoniated liver of sulphur, which is dissolved by the boiling liquor, may be divided into two parts; one of which, that is the kermes, being overcharged with the regulus, and particularly with the sulphur, contains but a little alkali, which it draws along with it during its deposition. The other part, as it contains much more alkali, remains dissolved even in the cold liquor, by means of this larger quantity of alkali. All these propositions are to be explained and demonstrated by the following observations.

First, when the decoction of kermes is cold, and has formed all its sediment, if, without adding any thing to it, it be heated till it boil, it again entirely re-dissolves the kermes; the sediment disappears; the liquor becomes clear, and by cold is again rendered turbid and deposits sediment as before. Thus the kermes may be made to precipitate and to re-dissolve as often as we please.

Secondly, by digesting kermes in aqua-regia, which dissolves its alkali and regulus, the sulphur is separated pure. The acids of aqua-regia form a nitre and a febrifugal salt of Sylvius with the alkali of the kermes; and if a certain quantity of kermes be melted with black flux after having destroyed its sulphur by roasting, a true regulus of antimony may be obtained from it.

These experiments, which were made by Mr Geoffroy, and the detail of which is found in memoirs given to the Academy in the years 1734 and 1735, upon the analysis of kermes, shew evidently the presence of sulphur, of fixed alkali, and of regulus of antimony, in this compound. From Mr Geoffroy's experiments we find, that 72 grains of kermes contain about 16 or 17 grains of regulus, 13 or 14 grains of alkaline salt, and 40 or 41 grains of common sulphur.

Thirdly, by repeating the boiling of the liquor upon the antimony, more and more kermes will be formed each time by cooling, as at first; and this experiment may be repeated a great many times. Mr Geoffroy says, that he repeated it 78 times, without any other addition than that of pure water to supply that which was lost by evaporation; and that each time a considerable quantity of kermes was formed by cooling. This experiment proves, that the alkali transforms the antimony into kermes by overcharging itself with regulus and sulphur, and at each precipitation the kermes does not retain and take with it but a very small quantity of alkali.

Fourthly, if any acid be poured upon the liquor in which the kermes has been formed, and from which it has been entirely separated by cooling, Mr Beaume has observed, that this liquor is again rendered turbid, and that a second sediment is formed of a yellow reddish colour, which is nothing else than golden sulphur of antimony; that is, regulus of antimony and sulphur mixed together, but in very different proportions, and with very different strengths of union, from those in which they are found in the crude antimony.

After this precipitation, in the liquor a neutral salt

is left, which is formed by the contained alkali and the precipitating acid. From this experiment we find, that in the liquor from which the kermes has been deposited, a considerable quantity of antimoniated liver of sulphur remains, which differs from kermes by containing a much larger proportion of alkali; so that it can keep dissolved the regulus and sulphur with which it is united, even when the liquor is cold.

In the process for several antimonial preparations, a kermes, or compounds like it, are formed. This always happens when crude antimony is treated by fusion with a quantity of alkaline salt, so that an antimoniated liver of sulphur results from it, overcharged with regulus and sulphur; that is, containing more of these two substances than it can keep dissolved in cold water. If any of these combinations be boiled in water, a matter analogous to kermes is always deposited by cooling. This happens, for instance, to the scoria of the regulus of antimony, and in an operation described by Mr Geoffroy to abridge the process for making kermes by fusion.

To make kermes by fusion, Mr Geoffroy fuses two parts of antimony with one part of alkaline salt; he powders this matter while yet hot, and keeps it during two hours in boiling water; he then filtrates it, and receives the liquor into more boiling water, from which, when it cools, about six gros of kermes is deposited, when an ounce of antimony has been used. This method of making kermes is much more expeditious, but less perfect; for, as the author confesses, the kermes produced is not so fine and soft as that made in the ordinary method.

Mr Lemeris the elder mentions also, in his Treatise concerning Antimony, an operation from which his son pretends that kermes may be obtained. This operation consists in digesting, and afterwards boiling, powdered crude antimony in a very pure liquor of fixed nitre. This liquor, if it be in sufficient quantity, is capable of dissolving, quickly and entirely, powdered crude antimony; and we cannot doubt but that, by cooling, a considerable quantity of a substance very analogous to kermes will be produced. Nevertheless, none of these short methods of making kermes is directed by dispensatories, or by the best books for describing the preparations of chemical remedies.

Kermes is used in medicine only; and from it singularly excellent effects may be produced, when administered by able physicians. In kermes are united the exciting and evacuant virtues of the emetic preparations of antimony, with the tonic, dividing, aperitive, and resolving properties of the liver of sulphur; that is to say, that it is capable of answering two principal indications in the treatment of many acute and chronic diseases. Properly managed, it may become an emetic, purgative, a diuretic, a sudorific, or an expectorant, as is required, and it is always attenuating and resolving. When seven or eight grains are taken at once, it chiefly acts upon the primæ viæ, generally as an emetic and as a purgative. A dose of three or four grains is seldom emetic, and more frequently purgative. When taken in these quantities as an evacuant, a little of it passes also into the viæ secundæ & tertiæ. When it is administered in smaller doses, it passes almost entirely into the lacteal, blood, and lymphatic vessels. In these it occasions such spasms and oscillations

Kern,  
Kerry.

tions as it does in the primæ viæ; so that it increases all secretions and excretions, but particularly those of urine, sweat, and expectoration, according to the dose, to the nature of the disease, and to the disposition of the patient. It produces very good effects in those diseases of the breast which proceed from fullness and obstruction.

Kermes may be administered in linctuses, in oily or in cordial potions, in any vehicle; or incorporated in a bolus, with other suitable remedies. One precaution, hitherto little observed, is very necessary; that is, not to join it with acid matters, if it is intended to act as kermes. Anti-acid and absorbent substances ought to be joined with it, if the patient has an acid in the primæ viæ, or an acceſcent disposition; for as these acids saturate the alkali by which the kermes is rendered an antimoniated liver of sulphur, and by which alone it differs from golden sulphur of antimony, they accordingly render the kermes entirely similar to the golden sulphur of antimony, the properties of which are very different from those of kermes.

KERN, or KERNE, a term in the ancient Irish militia, signifying a *foot-soldier*.—Camden tells us, the armies of Ireland consisted of cavalry, called *galloglas-fes*; and infantry, lightly armed, called *kernes*.—The kernes bore swords, and darts; to the last were fitted cords, by which they could recover them, after they had been lanced out.

KERNES, in our laws, signify idle persons, or vagabonds.

KERRY, a county of Ireland, in the province of Munster, bounded on the north by the river Shannon, which divides it from Clare; on the east, by Limerick and Cork; on the south, by another part of Cork; and on the west, by the Atlantic ocean. This county is diversified with high hills and fruitful vales; and in the middle there is a lake called *Lough Lean*, which is several miles in compass, and falls into the ocean thro' a little river of the same name. Some of the mountains produce very fruitful pastures, whose grass is high and good. The sheep and cattle feed there in the summer; but in the winter the ground becomes so spongy and boggy, that it will not bear a man. The coast of this county has several gulphs and promontories. That on the north has the name of the county; and is covered with such high mountains, that they may be seen at 50 miles off. These are called *Brandon Hills*. Near its extremity are two good havens; that on the north is called *Smirwick*, and that on the south *Dingle*. The town so called has a good haven; from whence it has its name, and is covered with a large rock. The bay of Dingle is long, broad, entering several miles into the country, and has two or three good havens; that of Ventry is four miles to the west of Dingle, and that of Castlemagne is at the bottom of the bay. Ardara is the capital town, and is a bishop's see. The second promontory is Glancara, or Glencara, seated between the bay of Dingle and that of Maire; it has a long chain of mountains, and Lough-Lean communicates as well with the bay of Dingle as of Maire, by two small rivers which form an island. There is a small island hereabouts called *Valencia*, defended by a fort. The bay of Maire has its name from a small river; and is narrower than that of Dingle, tho' it runs farther into the country.

Kessel  
Ketch.

KESSEL, a town of Upper Guelderland, in the Netherlands, with a handsome castle. It is the chief town in the territory of the same name, and seated on the river Meuse, between Ruremond and Venlo, it being about five miles from each. It was ceded to the king of Prussia, by the treaty of Utrecht. E. Long. 6. 13. N. Lat. 41. 22.

KESSELDORF, a village of Germany, in the circle of Upper Saxony, three miles below Dresden, remarkable for the battle gained by the king of Prussia over the Saxons, on the 15th of December 1745.

KESWICK, a town of Cumberland, situated on the side of a lake, in a fruitful plain, almost encompassed with mountains, called the *Terwent Fells*. It was formerly a town of good note, but now is much decayed. However, it is still noted for its mines and miners, who have a convenient smelting-house on the side of the river Derwent, the stream of which is so managed, as to make it work the bellows, hammers, and forge, as also to saw boards. There is a work-house here for employing the poor of this parish, and that of Crosthwaite. -W. Long. 3. o. N. Lat. 54. 30.

KETTLE, in the art of war, a term the Dutch give to a battery of mortars, because it is sunk under ground.

KETTLE-Drums, are formed of two large basins of copper or brass, rounded at the bottom, and covered over with vellum or goat-skin, which is kept fast by a circle of iron, and by several holes fastened to the body of the drum, and a like number of screws to screw up and down, and a key for the purpose. The two basins are kept fast together by two straps of leather which go through two rings, and are fastened the one before and the other behind the pommel of the kettle-drums saddle. They have each a banner of silk or damask, richly embroidered with the sovereign's arms, or with those of the colonel, and are fringed with silver or gold; and, to preserve them in bad weather, they have each a cover of leather. The drumsticks are of crab-tree or of any other hard wood, of eight or nine inches long, with two knobs on the ends, which beat the drum-head and cause the sound. The kettle-drum with trumpets is the most martial found of any. Each regiment of horse has a pair.

KETTLE-Drummer, a man on horseback appointed to beat the kettle-drums, from which he takes his name. He marches always at the head of the Squadron, and his post is on the right when the Squadron is drawn up.

KETTLEWELL (John), a learned divine, born in 1653, was descended from an ancient family in the North-riding of Yorkshire, bred in Edmund-Hall Oxford, and elected fellow of Lincoln-college. In 1675, he went into orders; but after the revolution was deprived of his living, on account of his refusal to take the oaths to king William and queen Mary. He died of a consumption in 1695. He published several works, which were collected and reprinted together in 1718, in 2 vols folio. He was a man of great candour, meekness, piety, and charity.

KETCH, a vessel equipped with two masts, viz. the main-mast and mizen-mast, and usually from 100 to 250 tons burden.—Ketches are principally used as yachts, or as bomb-vessels; the former of which are employed to convey princes of the blood, ambassadors,



Kevels  
||  
Key.

or other great personages, from one part to another; and the latter are used to bombard citadels, towns, or other fortresses. The bomb-ketches are therefore furnished with all the apparatus necessary for a vigorous bombardment; they are built remarkably strong, as being fitted with a greater number of *riders* than any other vessel of war; and indeed this reinforcement is absolutely necessary to sustain the violent shock produced by the discharge of their mortars, which would otherwise in a very short time shatter them to pieces.

KEVELS, in ship-building, a frame composed of two pieces of timber, whose lower ends rest in a sort of step or foot, nailed to the ship's side, from whence the upper ends branch outward into arms or horns, serving to belay the great ropes by which the bottoms of the main-mast and fore-mast are extended.

KEW, a village of Surry in England, opposite to Old Brentford, to miles west from London. Here is a seat which belonged to the late prince of Wales. Of late years a considerable extent of ground has been taken into the gardens of Kew, which are agreeably laid out in lawns, walks, and groves, embellished with temples, alcoves, and a very lofty brick tower, in the Chinese style of architecture. On Kew-green are a great number of elegant country-houses, belonging to the royal family, and other persons of distinction.

KEXHOLM, that part of Finland which borders upon Russia. The lake Ladoga crosses it, and divides it into two parts. By the treaty between Russia and Sweden in 1721, the Swedes were obliged to abandon the best part to the Russians. The country in general is full of lakes and marshes, thinly inhabited, and badly cultivated. The lake abovementioned is 120 miles in length, and full of fish.

KEXHOLM, or *Carelgorod*, a town of Russia, in a territory of the same name, not very large, but well fortified, and has a strong castle. The houses are built with wood. It formerly belonged to the Russians, after which the Swedes had possession of it for a whole century; but it was re-taken by the Russians in 1710. Near it is a considerable salmon-fishery. It is seated on two islands on the north-west side of the lake Ladoga, in E. Long. 30. 25. N. Lat. 61. 12. Near it is another town called *New Kexholm*.

KEY, an instrument for the opening of locks. See Lock.

L. Molinus has a treatise of keys, *De clavibus veterum*, printed at Upsal: he derives the Latin name *clavis*, from the Greek *κλειδο*, *clau-do*, "I shut;" or from the adverb *clam*, "privately;" and adds, that the use of keys is yet unknown in some parts of Sweden.

The invention of keys is owing to one Theodore of Samos, according to Pliny and Polydore Virgil: but this must be a mistake, the use of keys having been known before the siege of Troy; mention even seems made of them in the 19th chapter of Genesis.

Molinus is of opinion, that keys at first only served for the untying certain knots, wherewith they anciently secured their doors: but the Laconic keys, he maintains, were nearly akin in use to our own; they consisted of three single teeth, and made the figure of an E; of which form there are still some to be seen in the cabinets of the curious.

There was another key called *βαλλανγκρα*, made in the

manner of a male-screw; which had its corresponding female in a bolt affixed to the door. *Key* is, hence, become a general name for several things serving to shut up or close others.

KEY, or *Key-stone*, of an Arch or Vault, is the last stone placed a-top thereof; which being wider and fuller at the top than bottom, wedges, as it were, and binds all the rest. The key is different in the different orders: in the Tuscan and Doric, it is a plain stone, only projecting; in the Ionic, it is cut, and waved somewhat after the manner of consoles; in the Corinthian and Composite, it is a console, enriched with sculpture, foliages, &c.

KEY is also used for ecclesiastical jurisdiction; particularly for the power of excommunicating and absolving. The Romanists say, the pope has the power of the keys, and can open and shut Paradise as he pleases; grounding their opinion on that expression of Jesus Christ to Peter, "I will give thee the keys of the kingdom of heaven." In St Gregory we read, that it was the custom heretofore for the popes to send a golden key to princes, wherein they inclosed a little of the filings of St Peter's chains, kept with a world of devotion at Rome; and that these keys were worn in the bosom, as being supposed to contain some wonderful virtues.

KEY is also used for an index or explanation of a cipher. See CIPHER.

KEYS of an Organ, *Harpsichord*, &c. those little pieces in the fore-part of those instruments, by means whereof the jacks play, so as to strike the strings. These are in number 28 or 29. In large organs there are several sets of the keys, some to play the secondary organ, some for the main-body, some for the trumpet, and some for the echoing trumpet, &c.; in some there are but a part that play, and the rest are only for ornament. There are 20 flits in the large keys, which make half-notes. See the article ORGAN, &c.

KEY, in music, a certain fundamental note or tone, to which the whole piece, be it in cantata, sonata, concerto, &c. is accommodated, and with which it usually begins, but always ends.

KEY, or *Quay*, a long wharf, usually built of stone, by the side of a harbour or river, and having several storehouses for the convenience of lading and discharging merchant-ships. It is accordingly furnished with posts and rings, whereby they are secured; together with cranes, capsterns, and other engines, to lift the goods into or out of the vessels which lie along-side.

The verb *cajare*, in old writers, according to Scaliger, signifies to *keep in*, or *restrain*; and hence came our term *key* or *quay*, the ground where they are made being bound up with planks and posts.

KEYS are also certain funken rocks, lying near the surface of the water, particularly in the West-Indies.

KEYSER'S PILLS, a celebrated mercurial medicine, the method of preparing which was purchased by the French government, and has since been published by M. Richard.

The first, and what, according to Mr Keyser, is the most essential operation, consists in separating the mercury very exactly from all heterogeneous matter, by reducing it to an æthiops. This is effected by means of

Key.  
Keyier.

Keyser.

of an hydraulic machine, a plan of which Mr Keyser intended to have given to government before his death: but, although he did not live to accomplish his resolution, his family still offer to do it when desired. According to the description given by M. Richard, this machine consists of a number of buckets, in which mercury is triturated with water, till the water acquires a black colour. This water, upon standing, deposits a sediment, which, being dried by a proper heat, is the sethiops required.

The second process consists in revivifying the mercury by distillation, in freeing it from all oily matters by means of quick-lime, in detaching this quick-lime by repeated washings, and afterwards in drying it by means of a sand heat.

The third operation consists in the reduction of the mercury purified by this process to a red calx, by means of heat. In conducting this operation, Mr Keyser advises, that the mercury be put into glass matrases, a small quantity only in each. For the proper degree of heat, he directs those who would practise the operation, to consult Lemery, and other chemists.

The fourth operation is, the dissolution of the calcined mercury, obtained by the former process, in distilled vinegar, by means of triture. A pound of this mercury may be dissolved in eight pints of vinegar, by rubbing it, for an hour or two, in a mortar, which should be kept solely for that purpose. Care must also be taken that the vinegar be not distilled in a metallic, but in a glass vessel.

The fifth process consists in the intimate mixture of this vinegar, impregnated with mercury, with manna. Each pound of the vinegar, containing about two ounces of mercury, will require two pounds of manna. They must be rubbed together upon marble stones, till they acquire a uniform consistence, which will be liquid to such a degree as to pass thro' a hair-cloth, for separating the impurities of the manna. After being managed in this manner, it must be spread upon a marble slab, and left to dry there, without the assistance of fire, till it acquires such a consistence as not to run off upon the table being turned to its side. It must then be placed before the fire, and at the same time moved from one part of the stone to another, by means of a knife, furnished with a large plant blade. By this means, it is perfectly prepared for forming the pills.

The sixth and last process consists in the formation of the mafs thus prepared into pills. These Mr Keyser made to weigh either three grains, or a grain and a half, the first for robust, the last for delicate constitutions.

To this account given for the preparation of these pills, Mr Keyser has added some reflections, by way of supplement. He observes, that, by the purification of the mercury from distillation, a great quantity of heterogeneous matter is separated from it. This, however, by no means frees it completely from all foreign matter. And, as mercury purified, upon being calcined and dissolved in vegetable acid, is a much more powerful medicine than mercury calcined without purification, he concludes, that repeated purifications would render it still more active.

Another remark which he gives, respects the dissolution of the mercurius calcinatus in the distilled vine-

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gar. He observes, that the mercury thus dissolved may be made to unite with running mercury, and to form a very singular product. He formerly mentioned, that a pound of this mercurius calcinatus was to be dissolved in eight pints of vinegar. If to this be added two pounds of running mercury, and the agitation continued, a substance will arise to the surface in the form of cream. This being removed by the assistance of a wooden spoon, more will continue to rise as long as the agitation is continued. The cream being dried, and incorporated with manna, in the proportion of one part of the cream to eight of manna, forms a very useful purgative, and is said to be an effectual remedy against recent venereal complaints, particularly against chancres.

Mr Richard concludes his account of Keyser's pills with observing, that he considers it to be, without exception, the most effectual remedy for the venereal disease hitherto discovered. But, before entering upon the detail, he remarks, that it is his opinion the process may be much abridged, without diminishing the efficacy of the medicine. He judged it proper, however, to deliver to the public the method of preparing the pills in Mr Keyser's own words; and he has not afterwards pointed out the improvements he proposes.

KEYSLER (John George), a learned German antiquarian, was born at Thourneau, in 1689. After studying at the university of Halle, he was appointed preceptor to Charles Maximilian, and Christian Charles, the young counts of Giech Buchau; with whom he travelled through the chief cities of Germany, France, and the Netherlands, gaining great reputation among the learned as he went along, by illustrating several monuments of antiquity, particularly some fragments of Celtic idols lately discovered in the cathedral of Paris. Having acquitted himself of this charge with great honour, he procured, in 1716, the education of two grandsons of Baron Bernstorff first minister of state to his Britannic majesty as elector of Brunswick Lunenburg. However, obtaining leave, in 1718, to visit England, he was elected a fellow of the Royal Society for a learned essay *De Dea Nephelennia numine veterum Walachorum topico*: he gave also an explanation of the ancient monument on Salisbury plain called *Stone-henge*, with *A dissertation on the consecrated mistletoe of the Druids*. Which detached essays, with others of the same kind, he published on his return to Hanover, under the title of *Antiquitates selecte Septentrionales et Celticae*, &c. He afterwards made the grand tour with the young barons, and to this tour we owe the publication of his travels; which were translated into English, and published in 1756, in 4 vols 4to. Mr Keyser, on his return, spent the remainder of his life under the patronage of his noble pupils, who committed their fine library and museum to his care, with a handsome income. He died in 1743.

KIAM, a great river of China, which takes its rise near the western frontier, crosses the whole kingdom eastward, and falls into the bay or gulph of Nanking, a little below that city.

KIBURG, a town of the canton of Zurich in Switzerland, with a castle; seated on the river Theuff, in E. Long. 8. 50. N. Lat. 47. 20.

KIDDER (Dr Richard), a learned English bi-

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shop, was born in Suffex, and bred at Cambridge. In 1689, he was intalled dean of Peterborough; and in 1691, was nominated to the bishopric of Bath and Wells, in the room of Dr Thomas Ken, who had been deprived for not taking the oaths to king William and queen Mary. He published, 1. The young man's duty. 2. A demonstration of the Messiah, 3 vols 8vo. 3. A commentary on the five books of Moses, 2 vols 8vo, and several other pious and valuable tracts. He was killed, with his lady, in his bed, by the fall of a stack of chimneys, at his house in Wells, during the great storm in 1703. The bishop, in the dissertation prefixed to his commentary on the five books of Moses, having reflected upon Monsieur Le Clerc, some letters passed between them in Latin, which are published by Le Clerc in his *Bibliothèque Choisie*.

KIDDERMINSTER, or KEDDERMINSTER, a town of Worcestershire. It is governed by a bailiff, 12 capital burgesses, and 24 common council-men. It has a good free school, and two alms-houses; and drives a considerable trade in a manufacture called *Kidderminster-stuff*, and *carpets*. It is seated under a hill, on the river Stour, not far from the Severn; and is a compact town, and well inhabited. W. Long. 2. 15. N. Lat. 52. 28.

KIDNAPPING, the forcible abduction or stealing away of man, woman, or child, from their own country, and sending them into another. This crime was capital by the Jewish law: "He that stealeth a man and selleth him, or if he be found in his hand, shall surely be put to death\*." So likewise in the civil law, the offence of spiriting away and stealing men and children, which was called *plagium*, and the offenders *plagiarii*, was punished with death. This is unquestionably a very heinous crime, as it robs the king of his subjects, banishes a man from his country, and may in its consequences be productive of the most cruel and disagreeable hardships; and therefore, the common law of England has punished it with fine, imprisonment, and pillory. And also the statute 11 and 12 W. III. c. 7. though principally intended against pirates, has a clause that extends to prevent the leaving of such persons abroad as are thus kidnapped or spirited away; by enacting, that if any captain of a merchant-vessel shall (during his being abroad) force any person on shore, or wilfully leave him behind, or refuse to bring home all such men as he carried out, if able and desirous to return, he shall suffer three months imprisonment.

KIDNEYS, in anatomy. See there, n° 362.

KIDNEY Bean. See PHASEOLUS.

KIEL, a city of Germany, in the duchy of Holstein, in the circle of Lower Saxony, and the residence of the duke of Holstein Gottorp. It has a castle, and a university founded in 1665; and there is a very celebrated fair held here. It is seated at the bottom of a bay of the Baltic Sea, called *Killarwick*, at the mouth of the river Schwentin, in E. Long. 10. 17. N. Lat. 54. 26.

KIGGELARIA, in botany, a genus of the decandria order, belonging to the diœcia class of plants. There is but one species, viz. the Africanæ. It hath an upright woody stem, and purplish branches, growing 15 or 18 feet high; oblong, sawed, alternate leaves; and diœcious, greenish-white flowers, in clus-

ters from the sides of the branches; succeeded by globular rough fruit, the size of cherries, containing the seeds, which seldom ripen here. As this is a native of warm climates, it must be constantly kept in a stove in this country. It is propagated by seeds, layers, or cuttings, though most readily by seeds.

KILARNEY, a small town in the county of Kerry in Ireland, which gives name to a lake, one of the most beautiful, perhaps, in the world. This lake, which may not improperly be distinguished into three, the upper, lower, and middle, excepting one narrow valley on the south, through which a river runs into the upper lake, is surrounded with one continued range of lofty mountains, rocks, and precipices, the immense declivities of which are covered with woods intermixed with ever-greens, from nearly their tops down to the verge of the lakes; add to this the number of rivulets cascading from channels skirted with trees of every kind down the sides of these enormous mountains, some of them to the height of 100 yards. Over the lake are dispersed a great number of islands of very different extent; and all of them of any size, (one only excepted, which is inhabited by an innumerable sight of rabbits,) beautifully ornamented with trees of every kind, with a most delightful intermixture of ever-greens, as box, holly, yew, and the arbutus or strawberry-tree. Hollies of a prodigious magnitude are found here, some of above two feet diameter in the body of the tree. The arbutus grows in great plenty and perfection on many of the islands; the largest of them are about six or seven inches in diameter, and 15 or 20 feet high. They appear in their greatest beauty and perfection about November. There is a most enchanting prospect from some of the surrounding mountains, particularly from a very lofty one called the *Turk*, because its white chalky top looks like a Turkish turban. On the very summit of one of the Mangerton mountains, in the neighbourhood, is a small round lake, of about a quarter of a mile diameter across the top, called the *devil's punch-bowl*. From the surface of the lake to the top of the sides of this vast concavity or bowl, may be about 300 yards; and when viewed from the circular top, it really has a most astonishing appearance. The depth of it, doubtless, is vastly great, but not, as the natives of it pretend, unfathomable. The discharge of the superfluous waters of this bowl, through a chasm or gap into the middle lake, forms one of the finest cascades in the world, visible for above 150 yards. The devil's punch-bowl, as it is called in our maps, is by the natives in the neighbourhood termed *Poulter Infrin*, that is, "the hole of hell." The echoes among the hills in the southern and more inclosed parts of the great lake, but especially in the winding, deep, and intricate valley leading from the lower to the upper lake, are equally delightful and astonishing. There are some cannon placed in the most advantageous situations by the lord Kenmare, a Roman Catholic nobleman, on purpose for the entertainment of travellers, who generally provide themselves with ammunition for loading them. The reports, on the discharge of these cannon, resemble the nearest of any thing in nature a most violent peal of thunder rolling among the mountains. Here also musical instruments, especially the horn and trumpet, afford the most delightful and ravishing enter-

Kilarny.

\* Exod. xxi. 16.



Kilarny,  
Kilda.

tainment to the ear; and to a sportsman nothing can equal the spirit and elevating joy of a flag-hunt among the woods and mountains about the lake of Kilarny, where the cry of the hounds, the harmony of the horns resounding from the hills on every side, the universal shouts of joy along the valleys, and from the sides of the mountains, re-echoing from hill to hill, and from rock to rock, gives the highest satisfaction and delight that can possibly arise from the chase. The gentlemen who attend the hunt are generally in boats on the lake, during the diversion; for to follow it by land, either on foot or horseback, is impracticable. Among the high craggy inaccessible heights that surround the lakes, there is one stupendous and frightful rock, the front of which, to the water, is a most horrible precipice, called the *eagles nest*, from its being seldom without a nest of them upon its top. On the eastern side is a rich and fertile plain for two or three miles, through which descends a river into the lower lake; and through a valley at the west end, the whole collection of waters discharge themselves into the sea. On the north-east side stands the town of Kilarny, in a delightful situation; and, in the summer-time, from the number of visitors to the lake, is a very cheerful lively town, it being as much the fashion in Ireland to visit this lake at that season, as it is elsewhere to go to drink the waters at the public spas, or to bathe in the sea. In the neighbourhood of the lake are a great many seats and villas, ruins, &c. Pearls of great value are sometimes found about the lake; salmon also are caught in great plenty and perfection, and sold at the moderate price of one penny per pound. The fishery is the property of the earl of Kenmare; to whom also belongs a great part, if not the whole, of the lake, with its beautiful islands. The bowels of the peninsula, between the upper and lower lakes, are fraught with mines of copper; and even silver, it is said, hath been extracted from them. They are prodigiously deep, and have been worked a great way under the lake.

KILDA (St), one of the Hebrides, or western islands of Scotland. It lies in the Atlantic ocean, about 58. 30. N. Lat.; and is about three English miles in length from east to west, and its breadth from south to north not less than two. The ground of St Kilda, like much the greatest part of that over all the Highlands, is much better calculated for pasture than tillage.—Refrained by idleness, a fault or vice much more pardonable here than in any other part of Great Britain, or discouraged by the form of government under which they live, the people of the island study to rear up sheep, and to kill wild-fowl, much more than to engage deeply in the more toilsome business of husbandry. All the ground hitherto cultivated in this island lies round the village. The soil is thin, full of gravel, and of consequence very sharp. This, though naturally poor, is, however, rendered extremely fertile, by the singular industry of very judicious husbandmen: these prepare and manure every inch of their ground, so as to convert it into a kind of garden. All the instruments of agriculture they use, or indeed require, according to their system, are a spade, a mall, and a rake or harrow. After turning up the ground with a spade, they rake or harrow it very care-

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fully, removing every small stone, every noxious root or growing weed that falls in their way, and pound down every stiff clod into dust. It is certain that a small number of acres well prepared in St Kilda, in this manner, will yield more profit to the husbandman than a much greater number when roughly handled in a hurry, as is the case in the other Western isles. The people of St Kilda sow and reap much earlier than any of their neighbours on the western coast of Scotland. The heat of the sun, reflected from the hills and rocks into a low valley facing the south-east, must, in the summer-time, be quite intense; and however rainy the climate is, the corn must, for these reasons, grow very fast, and ripen early.

The harvest is commonly over at this place before the beginning of September; and should it fall out otherwise, the whole crop would be almost destroyed by the equinoctial storms. All the islanders on the western coast have great reason to dread the fury of autumnal tempests: these, together with the excessive quantities of rain they have, generally, throughout seven or eight months of the year, are undoubtedly the most disadvantageous and unhappy circumstances of their lives.

Barley and oats are the only sorts of grain known at St Kilda; nor does it seem calculated for any other. Fifty bolls of the former, old highland measure, are every year brought from thence to Harris; and all the western islands hardly produce any thing so good of the kind. Potatoes have been introduced among that people only of late, and hitherto they have raised but small quantities of them. The only appearance of a garden in this whole land, so the natives call their principal island in their own language, is no more than a very inconsiderable piece of ground, which is inclosed, and planted with some cabbages. On the east side of the island, at the distance of a quarter of a mile from the bay, lies the village, where the whole body of this little people (the number amounting in 1764 to no more than 88) live together like the inhabitants of a town or city. It is certain that the inhabitants were much more numerous formerly than at present; and the island, if under proper regulations, might easily support 300 souls. Martin, who visited it about the end of the last century, found 180 persons there; but about the year 1730, one of the people coming to the island of Harris, was seized with the small-pox and died. Unluckily his clothes were carried away by one of his relations next year; and thus was the infection communicated, which made such havoc, that only four grown persons were left alive. Their houses are built in two rows, regular, and facing one another; with a tolerable causeway in the middle, which they call the *street*. These habitations are made and contrived in a very uncommon manner. Every one of them is flat in the roof, or nearly so, much like the houses of some oriental nations. That from any one of these the St Kildians have borrowed their manner of building, no man of sense will entertain a suspicion. They have been taught this lesson by their own reason, improved by experience. The place in which their lot has fallen, is peculiarly subject to violent squalls and furious hurricanes: were their houses raised higher than at present, they believe the first winter-storm

would bring them down about their ears. For this reason, the precaution they take in giving them roofs much flatter than ordinary, seems to be not altogether unnecessary. The walls of these habitations are made of a rough gritty kind of stones, huddled up together in haste, without either lime or mortar, from eight to nine feet high. In the heart of the walls are the beds, which are overlaid with flags, and large enough to contain three persons. In the side of every bed is an opening, by way of door, which is much too narrow and low to answer that purpose. All their dwelling-houses are divided into two apartments by partition-walls. In the division next the door, which is much the largest, they have their cattle stalled during the whole winter-season; the other serves for kitchen, hall, and bed room.

It will be readily expected, that a race of men and women, bred in St Kilda, must be a very slovenly generation, and every way inelegant. It is indeed impossible to defend them from this imputation. Their method of preparing a sort of manure, to them indeed of vast use, proves that they are very indelicate. After having burnt a considerable quantity of dried turf, they spread the ashes with the nicest care over the floor of that apartment in which they eat and sleep. These ashes, so exactly laid out, they cover with a rich friable sort of earth; over this bed of earth they scatter a proportionable heap of that dust into which peats are apt to crumble away: this done, they water, tread, and beat the whole compost into a hard floor, on which they immediately make new fires very large, and never extinguished till they have a sufficient stock of new ashes on hand. The same operations are repeated with a never-failing punctuality, till they are just ready to sow their barley; by that time the walls of their houses are sunk down, or, to speak more properly, the floors risen, about four or five feet.

To have room enough for accumulating heaps of this compost one above another, the ancient St Kildians had ingenuity enough to contrive their beds within the linings of their walls; and it was for the same reason they took care to raise these walls to an height far from being common in the other western islands. The manure produced in this way must undoubtedly be good, though probably rather sharp than of long duration, as it is scattered in small quantities upon the surface of the ground. Be that as it will, those who practise this art are abundantly lavish in its praises. They call it a *commodity inestimably precious*; and one may venture to affirm, that a genuine St Kildian would scruple to barter it away for all the diamonds in Brazil and Golconda.

It is certain that cleanliness must contribute greatly to health, and of course longevity; but in spite of that instance of indelicacy now given, and many more which might have been added, the people of this island are not more short-lived than other men. Their total want of those articles of luxury, which have so natural a tendency to destroy the constitution of the human body, and their moderate exercises, will, together with some other circumstances, keep the balance of life equal enough between them and those who are absolute strangers to slovenliness.

Besides the dwelling-houses already described, there are a prodigious number of little cells, dispersed over

all the island; which consist entirely of stones, without any the smallest help of timber. These cells are from twelve to eighteen feet in length, and a little more than seven in height. Their breadth at the foundation is nearly equal to the height. Every stone hangs above that immediately below, not perpendicularly, but inclines forward, so as to be nearer the opposite side of the grotto, and thus by imperceptible degrees till the two highest courses are near enough to be covered by a single flag at the top. To hinder the rain from falling down between the interstices above, the upper part of the building is overlaid with turf, which looks like a fine greenward while new. The inhabitants secure their peats, eggs, and wild-fowl, within these small repositories: every St Kildian has his share of them, in proportion to the extent of land he possesses, or the rent he pays to the steward. From the construction of these cells, and the toil they must have cost before they could have been finished, it seems plain, that those who put them together, were, if not more ingenious than their neighbours in the adjacent islands, at least more industrious than their own successors.

The St Kilda method of catching wild-fowl is very entertaining. The men are divided into fowling-parties, each of which consists generally of four persons distinguished by their agility and skill. Each party must have at least one rope about thirty fathoms long; this rope is made out of a strong raw cow-hide, salted for that very purpose, and cut circularly into three thongs, all of equal length; these thongs being closely twined together, form a three-fold cord, able to sustain a great weight, and durable enough to last for about two generations: to prevent the injuries it would otherwise receive from the sharp edges of the rocks, against which they must frequently strike, the cord is lined with sheep-skins, dressed in much the same manner.

This rope is a piece of furniture indispensably necessary, and the most valuable implement a man of substance can be possessed of in St Kilda. In the testament of a father, it makes the very first article in favour of his eldest son: should it happen to fall to a daughter's share, in default of male heirs, it is reckoned equal in value to the two best cows in the island.

By the help of such ropes, the people of the greatest prowess and experience here traverse and examine rocks prodigiously high. Linked together in couples, each having either end of the cord fastened about his waist, they go frequently through the most dreadful precipices: when one of the two descends, his colleague plants himself on a strong thorn, and takes care to have such sure footing there, that if his fellow-adventurer makes a false step, and tumbles over, he may be able to save him.

The following anecdote of the present steward of St Kilda's deputy, will give the reader a specimen of the dangers they undergo, and, at the same time, of the uncommon strength of the St Kildians. This man, observing his colleague lose his hold, and tumbling down from above, placed himself so firmly upon the shelf where he stood, that he sustained the weight of his friend, after falling the whole length of the rope. Undoubtedly these are stupendous adventures, and equal to any thing in the feats of chivalry. Mr Macaulay



Kildare aulay gives an instance of the dexterity of the inhabitants of St Kilda in catching wild-fowl, to which he was an eye-witness. Two noted heroes were drawn out from among all the ablest men of the community: one of them fixed himself on a craggy shelf; his companion went down sixty fathoms below him; and after having darted himself away from the face of a most alarming precipice, having over the ocean, he began to play his gambols; he sung merrily, and laughed very heartily: after having performed several antic tricks, and given all the entertainment his art could afford, he returned in triumph, and full of his own merit, with a large string of fowls about his neck, and a number of eggs in his bosom. This method of fowling resembles that of the Norwegians, as described by bishop Pontoppidan.

KILDARE, a town of Ireland, and capital of a county of the same name, with a bishop's see, and the title of an earldom. W. Long. 7. o. N. Lat. 53. 10.

KILDARE, a county of Ireland, in the province of Leinster, which is 37 miles in length, and 24 in breadth; and is bounded on the east by Dublin and Wicklow, on the west by King and Queen's county, on the north by East-Meath, and on the south by Catherlogh. It is a rich plentiful country, and the capital town is of the same name. It contains near 9000 houses, 100 parishes, 10 baronies, and four boroughs. It sends 10 members to parliament.

KILDERKIN, a liquid measure, containing two firkins.

KILIANUS (Cornelius), a native of Brabant, distinguished himself as an excellent corrector of the press at the printing-house of Plantin for 50 years. He likewise wrote several books which are esteemed. His apology for correctors against authors, an epigram of 18 verses, is a proof of his abilities in Latin poetry.

KILKENNY, a county of Ireland, in the province of Leinster, bounded on the south by the county of Waterford, on the north by the Queen's county; on the west by the county of Tipperary, on the east by the counties of Wexford and Catherlogh, and on the north-west by Upper Ossory. The greatest length of this country from north to south is 40 miles, the breadth from east to west 20; and it contains 10 baronies. It is one of the most healthful, pleasant, and populous counties of Ireland. The members sent by it to parliament are 16, *viz.* two for the county, two for Kilkenny, and two a-piece for Irish-town, or St Kennis, Gowran, Thomastown, Callan, Innistock, and Knocktopher. This county is divided, as it were, into two parts, by the river Neor or Nura, which has its source in those lofty mountains called the *Slievebloom* or *Blandinehills*.

KILKENNY, the capital of a county of the same name in Ireland, situated in W. Long. 7. 15. N. Lat. 52. 30. takes its name from the cell or church of Canic, who was an eminent hermit in this country. It is the seat of the bishop of Ossory, which was translated from Agabo, in Ossory, about the end of Henry II's reign, by bishop O'Duillany. The city is divided into the English and Irish towns. The English town is much the newer and most considerable; the other, (which is also called *St Kenny's* or *Canic's*, from the cathedral dedicated to that saint, which stands upon an eminence (where there is a most delightful prospect), being only

a kind of suburbs. Both together make one of the largest, most wealthy, populous, and trading towns in the kingdom. Here are barracks for a troop of horse and four companies of foot; and a well endowed free-school, called the *college*. The supreme council of the rebels under the pope's nuncio sat at Kilkenny during the time of the general massacre. The city is pleasantly situated on the Neor, a navigable river that discharges itself into the harbour of Waterford. It is said of Kilkenny, that its air is without fog, its water without mud, its fire without smoke, and its streets paved with marble. The two latter are, indeed, matter of fact; for they have, in the neighbourhood, a kind of coal, that burns from first to last without smoke, and pretty much resembles the Welsh coal. Most of the streets also are actually paved with a very good sort of black marble, of which they have large quarries near the town, which takes a fine polish, and is beautifully intermixed with white granite. The air too is good and healthy, though not remarkably clearer than in many other parts of the kingdom. Here is the ancient seat of the Ormond family, which is an ornament to the city; and the neighbouring country is well cultivated and very fertile.

About two miles from this city, in the neighbourhood of the park-house of Donmore, formerly occupied by the duke of Ormond, are a number of caves as curious, perhaps, as any mentioned in history, except those of *Antiparos* in the Archipelago: we shall present the reader with a description of them taken on the spot, by an ingenious gentleman of Dublin. "After a difficult descent of about 100 feet, the entrance into this subterranean world is gained. The appearance of the first cavern is uncommonly awful; and gives rise to an idea of a Gothic structure, grand in ruin. The solemnity of this place is not a little increased by the gaiety of those scenes that present themselves on every side previous to our entering it. The floor is uneven, and stones of various sizes are promiscuously dispersed upon it. The sides are composed of ragged work; in some parts covered with moss, and in others curiously frosted; and from the roof, which is a kind of arch, several huge rocks project beyond each other, that seem to threaten instant ruin. The circumference of this cave is not less than 200 feet, and its height about 50. Here is a small but continual dropping of water from the ceiling, and a few petrifications resembling icicles. This place has its inhabitants; for immediately on entering into it, you are surprised with a confused noise, which is occasioned by a multitude of wild pigeons. Hence there is a passage towards the left, where, by a small ascent, a kind of hole is gained, like to, but larger than, the mouth of an oven, which introduces to a place, where, by the help of candles, day-light being entirely excluded, a broken and surprising scene of monstrous stones, heaped on each other, chequered with various colours, inequality of rocks overhead, and an infinity of fantastical stones, presents itself. It would be matter of much difficulty, or rather impracticable, to walk over this apartment, had not nature, as if studious for the safety of the curious, caused sorts of branches to shoot from the surface of the rocks, which are remarkably smooth, very unequal, and always damp. These branches are from four to six inches in length, and nearly as thick. They are useful

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useful in the fummit of the rocks to prevent slipping; and in the sides are ladders, whereby to descend and ascend with tolerable facility. This astonishing amfractuous passage leads to a place far more curious than any of the rest. On entering into it, one is almost induced to believe himself situated in an ancient temple, decorated with all the expence of art; yet, notwithstanding the beauty and splendor that catches the eye on every side, there is something of solemnity in the fashion of the place, which must be felt by the most ordinary spectator. The floor in some parts is covered with a crystalline substance; the sides in many places are incruited with the same, wrought in a mode not unlike the Gothic style of ornament; and the top is almost entirely covered with inverted pyramids of the like elegantly white and lucid matter. At the points of these stalactical streets are perpetually hanging drops of pellucid water; for when one falls, another succeeds. These pendent gems contribute not a little to the glory of the roof, which, when the place is properly illuminated, appears as if formed of the purest crystal. Here are three extraordinary and beautiful congelations, which, without the aid of a strong imagination, may be taken for an organ, altar, and crosses. The former, except when strictly examined, appears to be a regular work of art, and is of a considerable size; the second is of a simple form, rather long than square; and the third reaches from the floor to the roof, which must be about 20 feet. These curious figures are owing to water that falls from the upper parts of the cave to the ground, which coagulated into stone from time to time, until at length it acquired those forms which are now so pleasing; or to an exsudation or exhalation of petrifying juices out of the earth; or perhaps they partake of the nature of spar, which is a kind of rock-plant. The former seems to be the most probable supposition; as these figures, in colour and consistence, appear exactly like the icicles on the top, which are only seen from the wet parts of the caverns; and in this place there is a greater oozing of water, and a much larger number of petrifications, than in any other. When this curious apartment has been sufficiently examined, the guides lead you for a considerable way through winding passages, until a glimmering light agreeably surprises. Here the journey of above a quarter of a mile, through those parts, is ended: but, upon returning into the first cavern, the entrance into other apartments, less curious indeed, but as extensive as those we have described, offers itself. The passages into some of those are so very low, that there is a necessity of creeping through them: by these we proceed until the noise of a subterranean river is heard, but farther none have ventured.

**KILLICRANKIE**, a noted pass of Argyleshire, in the Highlands of Scotland. It is formed by the lofty mountains impending over the water of Garrie, which rushes through in a deep, darksome, and horrid channel beneath. In the last century this was a pass of much danger and difficulty; a path hanging over a tremendous precipice threatened destruction to the least false step of the traveller: at present a fine road formed by the soldiery lent by government, and encouraged by an additional 6d. per day, gives an easy access to the remote Highlands; and the two sides are joined by a fine arch.

Near the north end of this pass in its open and unimproved state was fought, in the year 1689, the battle of Killcrankie, between the adherents of James II. under Viscount Dundee, and of William III. under general Mackay. Dundee's army was very much inferior to that of Mackay's. When he came in sight of the latter, he found them formed in eight battalions, ready for action. They consisted of 4500 foot, and two troops of horse. The Highlanders, under Dundee, amounted to little more than half that number. These he ranged instantly in order of battle. Maclean, with his tribe, formed the right wing. The Macdonalds of Sky, under their chieftain's eldest son, formed the left. The Camerons, the Macdonalds of Glengary, the followers of Clanronald, and a few Irish auxiliaries, were in the centre. A troop of horse were placed behind, under Sir William Wallace. The officers sent by James from Ireland were distributed through all the line. His whole army stood in sight of the enemy for several hours on the steep side of a hill, which faced the narrow plain where Mackay had formed his line. Dundee wished for the approach of night; a season suited for either victory or flight.

At five of the clock in the afternoon, a kind of slight skirmish began between the right wing of the Highlanders and the left of the enemy. But neither army wishing to change their ground, the firing was discontinued for three hours. Dundee, in the mean time, flew from tribe to tribe, and animated them to action. At eight of the clock he gave the signal for battle; and charged the enemy in person, at the head of the horse. The Highlanders, in deep columns, rushed suddenly down the hill. They kept their shot till they were within a pike's length of the enemy; and, having fired their muskets, fell upon them sword in hand. Mackay's left wing could not for a moment sustain the shock. They were driven by the Macleans with great slaughter from the field. The Macdonalds, on the left of the Highlanders, were not equally successful. Colonel Hafling's regiment of foot stood their ground. They even forced the Macdonalds to retreat. Maclean, with a few of his tribe, and Sir Evan Cameron at the head of his clan, fell suddenly on the flank of this gallant regiment, and forced them to give way. The slaughter ended not with the battle. Two thousand fell in the field and the flight. The tents, baggage, artillery, and provisions of the enemy, and even king William's Dutch standard, which was carried by Mackay's regiment, fell into the hands of the Highlanders. The victory was now complete. But the Highlanders lost their gallant leader. Perceiving the unexpected resistance of Colonel Hafling's regiment, and the confusion of the Macdonalds, Dundee rode rapidly to the left wing. As he was raising his arm, and pointing to the Camerons to advance, he received a ball in his side. The wound proved mortal, and with Dundee fell all the hopes of king James at that time.

**KILLIGREW** (William), eldest son of Sir Robert Killigrew knight, was born in 1605. He was gentleman-usher of the privy-chamber to king Char. I. and, on the restoration, to Charles II. When the latter married the princess Catharine of Portugal, he was created vice-chamberlain; in which station he continued 22 years, and died in 1693. He was the author of four plays, which, though now thrown aside, were much

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much applauded by the poets of that time, particularly by Mr Waller; and in the decline of life he published some pious reflections on the instability of human happiness, when our views are not directed to a future fate.

KILLIGREW (Thomas), brother of the former, was born in 1611; and, in process of time, distinguished himself by his uncommon natural parts. He was page of honour to king Charles I. and groom of the bed-chamber to Charles II. with whom he suffered many years exile; during which he applied his leisure hours to the study of poetry, and to the composition of several plays. After the restoration, he continued in high favour with the king, and had frequently access to him when he was denied to the first peers in the realm; and being a man of great wit and liveliness of parts, and having from his long intimacy with that monarch, and being continually about his person during his troubles, acquired a freedom and familiarity with him, which even the pomp of majesty afterwards could not check in him, he sometimes, by way of jest, which king Charles was ever fond of, if genuine, even though himself was the object of the satire, would adventure bold truths which scarcely any one besides would have dared even to hint at. One story in particular is related of him, which, if true, is a strong proof of the great lengths he would sometimes proceed in his freedoms of this kind, which is as follows:—When the king's unbounded passion for women had given his mistress such an ascendant over him, that, like the effeminate Persian monarch, he was much fitter to have handled a distaff than to wield a sceptre, and for the conversation of his concubines utterly neglected the most important affairs of state, Mr Killigrew went to pay his Majesty a visit in his private apartments, habited like a pilgrim who was bent on a long journey. The king, surprised at the oddity of his appearance, immediately asked him what was the meaning of it, and whither he was going? "To hell," bluntly replied the wag. "Prithee, (said the king), what can your errand be to that place?" "To fetch back Oliver Cromwell, (rejoined he), that he may take some care of the affairs of England, for his successor takes none at all." One more story is related of him, which is not barren of humour. King Charles's fondness for pleasure, to which he almost always made business give way, used frequently to delay affairs of consequence from his majesty a disappointing the council of his presence when met for the dispatch of business, which neglect gave great disgust and offence to many of those who were treated with this seeming disrespect. On one of these occasions the duke of Lauderdale, who was naturally impetuous and turbulent, quitted the council-chamber in a violent passion; and, meeting Mr Killigrew presently after, expressed himself on the occasion in very disrespectful terms of his majesty. Killigrew begged his grace to moderate his passion, and offered to lay him a wager of 100l. that he himself would prevail on his majesty to come to council in half an hour. The duke, surprized at the boldness of the assertion, and warmed by his resentment against the king, accepted the wager; on which Killigrew immediately went to the king, and, without ceremony, told him what had happened; adding these words, "I know that your

majesty hates Lauderdale, though the necessity of your affairs compels you to carry an outward appearance of civility: now, if you choose to get rid of a man who is thus disagreeable to you, you need only go this once to council; for I know his covetous disposition so perfectly, that I am well persuaded, rather than pay this hundred pounds, he would hang himself out of the way, and never plague you more." The king was so pleased with the archness of this observation, that he immediately replied, "Well then, Killigrew, I positively will go;" and kept his word accordingly.—Killigrew died in 1682, and was buried in Weltminster-abbey.

KILLIGREW (Anne), "a Grace for beauty, and a Muse for wit," as Mr Wood says, was the daughter of Dr Henry Killigrew, brother of the two foregoing, and was born a little before the restoration. She gave early indications of genius, and became eminent in the arts both of poetry and painting. She drew the duke of York, and his duchess to whom she was paid of honour, as well as several other portraits and history-pieces; and crowned all her other accomplishments with unblemished virtue and exemplary piety. Mr Dryden seems quite lavish in her praise, though Wood assures us he has said no more of her than she was equal if not superior to. This amiable young woman died of the small-pox in 1685, and the year after her poems were published in a thin 4to volume.

KILMARNOCK, a populous and flourishing town of Ayrshire in Scotland, famous for its manufacture of broad cloth and hardware. It gave the title of earl to the noble family of Boyd, residing in this neighbourhood. This title was forfeited by the late earl, who, by engaging in the rebellion of 1745, was deprived of his honours, and lost his life on the scaffold. His son, however, who served in the king's army, afterwards succeeded to the earldom of Errol, a title much more ancient and honourable.

KIMBOLTON, a town of Huntingdonshire, seated in a bottom; and noted for the castle of Kimbolton, the seat of the duke of Manchester. W. Long. o. 15. N. Lat. 52. 18.

KIMCHI (David), a Jewish rabbi, famous as a commentator on the Old Testament, lived at the close of the 12th and beginning of the 13th centuries. He was a Spaniard by birth, son of rabbi Joseph Kimchi, and brother of rabbi Moses Kimchi, both men of eminent learning among the Jews: but he exceeded them both, being the best Hebrew grammarian the Jews ever had. He wrote a Grammar and Dictionary of that language; out of the former of which Buxtorf made his *Theaurus lingue Hebraeae*, and his *Lexicon lingue Hebraeae* out of the latter. His writings have been held in such estimation among the Jews, that no one can arrive at any reputation in letters and theology without studying them.

KINDRED, in law, persons related to one another, whereof the law reckons three degrees or lines, viz. the descending, ascending, and collateral line. See CONSANGUINITY and DESCENT.

On there being no kindred in the descending line, the inheritance passes in the collateral one.

KING, in the general acceptation of the word, is a person who has a supreme authority, with the power of levying taxes, making laws, and enforcing an obedience

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King.

dience to them: but in Britain, which is a limited monarchy, the power of the king is greatly restrained; which is so far from diminishing his honour, that it adds a glory to his crown; for while other kings are absolute monarchs over innumerable multitudes of slaves, the king of Britain has the distinguished glory of governing a free people, the least of whom is protected by the laws: he has great prerogatives, and a boundless power in doing good; and is at the same time only restrained from acting inconsistently with his own happiness, and that of his people.

To understand the royal rights and authority, we must consider the king under six distinct views. 1. With regard to his title. 2. His royal family. 3. His councils. 4. His duties. 5. His prerogative. 6. His revenue.

I. His title. For this, see *HEREDITARY Right*, and *SUCCESSION*.

II. His royal family. See *ROYAL Family*.

III. His councils. See *COUNCIL*.

IV. His duties. By our constitution, there are certain duties incumbent on the king; in consideration of which, his dignity and prerogative are established by the laws of the land: it being a maxim in the law, that protection and subjection are reciprocal. And these reciprocal duties are what Sir William Blackstone apprehends were meant by the convention in 1688, when they declared that king James had broken the original contract between king and people. But however, as the terms of that original contract were in some measure disputed, being alleged to exist principally in theory, and to be only deducible by reason and the rules of natural law, in which deduction different understandings might very considerably differ; it was, after the revolution, judged proper to declare these duties expressly, and to reduce that contract to a plain certainty. So that, whatever doubts might be formerly raised by weak and scrupulous minds about the existence of such an original contract, they must now entirely cease; especially with regard to every prince who hath reigned since the year 1688.

The principal duty of the king is, To govern his people according to law. *Nec regibus infinita aut libera potestas*, was the constitution of our German ancestors on the continent. And this is not only consonant to the principles of nature, of liberty, of reason, and of society; but has always been esteemed an express part of the common law of England, even when prerogative was at the height. "The king," saith Bracton, who wrote under Henry III. "ought not to be subject to man; but to God, and to the law; for the law maketh the king. Let the king therefore render to the law, what the law has invested in him with regard to others; dominion, and power: for he is not truly king, where will and pleasure rules, and not the law." And again: "The king hath a superior, namely God; and also the law, by which he was made a king." Thus Bracton: and Fortescue also, having first well distinguished between a monarchy absolutely and despotically regal, which is introduced by conquest and violence, and a political or civil monarchy, which arises from mutual consent, (of which last species he asserts the government of England to be), immediately lays it down as a principle, that "the king of England must rule his people ac-

cording to the decrees of the laws thereof; inasmuch that he is bound by an oath at his coronation to the observance and keeping of his own laws." But to obviate all doubts and difficulties concerning this matter, it is expressly declared by statute 12 & 13 W. III. c. 2. "that the laws of England are the birthright of the people thereof; and all the kings and queens who shall ascend the throne of this realm ought to administer the government of the same according to the said laws, and all their officers and ministers ought to serve them respectively according to the same: and therefore all the other laws and statutes of this realm, for securing the established religion, and the rights and liberties of the people thereof, and all other laws and statutes of the same now in force, are by his majesty, by and with the advice and consent of the lords spiritual and temporal, and commons, and by authority of the same, ratified and confirmed accordingly."

And, as to the terms of the original contract between king and people, these, it is apprehended, are now couched in the coronation-oath, which by the statute 1 W. & M. II. c. 6. is to be administered to every king and queen who shall succeed to the imperial crown of these realms, by one of the archbishops or bishops of the realm, in the presence of all the people; who on their parts do reciprocally take the oath of allegiance to the crown. This coronation-oath is conceived in the following terms.

"*The archbishop or bishop shall say*, Will you solemnly promise and swear to govern the people of this kingdom of Britain, and the dominions thereto belonging, according to the statutes in parliament agreed, and the laws and customs of the same?—*The king or queen shall say*, I solemnly promise so to do.

"*Archbishop or bishop*. Will you your power cause law and justice, in mercy, to be executed in all your judgments?—*King or queen*. I will.

"*Archbishop or bishop*. Will you to the utmost of your power maintain the laws of God, the true profession of the gospel, and the Protestant reformed religion established by the law? And will you preserve unto the bishops and clergy of this realm, and to the churches committed to their charge, all such rights and privileges as by law do or shall appertain unto them, or any of them?—*King or queen*. All this I promise to do.

"*After this the king or queen, laying his or her hand upon the holy gospels, shall say*, The things which I have here before promised, I will perform and keep: so help me God. *And then shall kiss the book.*"

This is the form of the coronation-oath, as it is now prescribed by our laws; the principal articles of which appear to be at least as ancient as the mirror of justices, and even as the time of Bracton; but the wording of it was changed at the revolution, because (as the statute alleges) the oath itself had been framed in doubtful words and expressions, with relation to ancient laws and constitutions at this time unknown. However, in what form soever it be conceived, this is most indisputably a fundamental and original express contract; though, doubtless, the duty of protection is impliedly as much incumbent on the sovereign before coronation as after: in the same manner as alle-

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giance to the king becomes the duty of the subject immediately on the descent of the crown, before he has taken the oath of allegiance, or whether he ever takes it at all. This reciprocal duty of the subject will be considered in its proper place. At present we are only to observe, that in the king's part of this original contract are exprest all the duties which a monarch can owe to his people, viz. to govern according to law; to execute judgment in mercy; and to maintain the established religion. And, with respect to the latter of these three branches, we may farther remark, that by the act of union, 5 Ann. c. 8. two preceding statutes are recited and confirmed; the one of the parliament of Scotland, the other of the parliament of England: which enact; the former, that every king at his accession shall take and subscribe an oath, to preserve the Protestant religion, and presbyterian church-government in Scotland; the latter, that at his coronation he shall take and subscribe a similar oath, to preserve the settlement of the church of England, within England, Ireland, Wales, and Berwick, and the territories thereunto belonging.

V. His prerogative. See PREROGATIVE.

VI. His revenue. See REVENUE.

Having in the preceding articles chalked out all the principal outlines of this vast title of the law, the supreme executive magistrate, or the king's majesty, considered in his several capacities and points of view; it may not be improper to take a short comparative review of the power of the executive magistrate, or prerogative of the crown, as it stood in former days, and as it stands at present. And we cannot but observe, that most of the laws for ascertaining, limiting, and restraining this prerogative have been made within the compass of little more than a century past; from the petition of right in 3 Car. I. to the present time. So that the powers of the crown are now to all appearance greatly curtailed and diminished since the reign of king James I. particularly by the abolition of the star-chamber and high-commission courts in the reign of Charles I. and by the disclaiming of martial law, and the power of levying taxes on the subject, by the same prince; by the disuse of forest-laws for a century past; and by the many excellent provisions enacted under Charles II.; especially the abolition of military tenures, purveyance, and pre-emption; the *habeas corpus* act; and the act to prevent the discontinuance of parliaments for above three years; and, since the revolution, by the strong and emphatical words in which our liberties are asserted in the bill of rights, and act of settlement; by the act for triennial, since turned into septennial, elections; by the exclusion of certain officers from the house of commons; by rendering the seats of the judges permanent, and their salaries independent; and by restraining the king's pardon from obstructing parliamentary impeachments. Besides all this, if we consider how the crown is impoverished and stripped of all its ancient revenues, so that it greatly depends on the liberality of parliament for its necessary support and maintenance, we may perhaps be led to think, that the balance is inclined pretty strongly to the popular scale, and that the executive magistrate has neither independence nor power enough left, to form that check upon the lords and commons which the founders of our constitution intended.

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But, on the other hand, it is to be considered, that every prince, in the first parliament after his accession, has by long usage a truly royal addition to his hereditary revenue settled upon him for his life; and has never any occasion to apply to parliament for supplies, but upon some public necessity of the whole realm. This restores to him that constitutional independence, which at his first accession seems, it must be owned, to be wanting. And then, with regard to power, we may find perhaps that the hands of government are at least sufficiently strengthened; and that a British monarch is now in no danger of being overborne by either the nobility or the people. The instruments of power are not perhaps so open and avowed as they formerly were, and therefore are the less liable to jealous and invidious reflections; but they are not the weaker upon that account. In short, our national debt and taxes (besides the inconveniencies beforementioned), have also in their natural consequences thrown such a weight of power into the executive scale of government, as we cannot think was intended by our patriot ancestors; who gloriously struggled for the abolition of the then formidable parts of the prerogative, and by an unaccountable want of foresight established this system in their stead. The entire collection and management of so vast a revenue, being placed in the hands of the crown, have given rise to such a number of new officers, created by and removable at the royal pleasure, that they have extended the influence of government to every corner of the nation. Witness the commissioners, and the multitude of dependents on the customs, in every port of the kingdom; the commissioners of excise, and their numerous subalterns, in every inland district; the post-masters, and their servants, planted in every town, and upon every public road; the commissioners of the stamps, and their distributors, which are full as scattered and full as numerous; the officers of the salt-duty, which, tho' a species of excise, and conducted the same manner, are yet made a distinct corps from the ordinary managers of that revenue; the surveyors of houses and windows; the receivers of the land-tax; the managers of lotteries; and the commissioners of hackney-coaches: all which are either mediately or immediately appointed by the crown, and removable at pleasure without any reason assigned: these, it requires but little penetration to see, must give that power, on which they depend for subsistence, an influence most amazingly extensive. To this may be added the frequent opportunities of conferring particular obligations, by preference in loans, subscriptions, tickets, remittances, and other money-transactions, which will greatly increase this influence; and that over those persons whose attachment, on account of their wealth, is frequently the most desirable. All this is the natural, though perhaps the unforeseen, consequence of erecting our funds of credit, and, to support them, establishing our perpetual taxes: the whole of which is entirely new since the restoration in 1660; and by far the greatest part since the revolution in 1688. And the same may be said with regard to the officers in our numerous army, and the places which the army has created. All which put together give the executive power so persuasive an energy with respect to the persons themselves, and so prevailing an interest with their friends and families, as will amply

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King. make amends for the loss of external prerogative.

But, though this profusion of offices should have no effect on individuals, there is still another newly acquired branch of power; and that is, not the influence only, but the force, of a disciplined army: paid indeed ultimately by the people, but immediately by the crown: raised by the crown, officered by the crown, commanded by the crown. They are kept on foot, it is true, only from year to year, and that by the power of parliament: but during that year, they must by the nature of our constitution, if raised at all, be at the absolute disposal of the crown. And there need but few words to demonstrate how great a trust is thereby reposed in the prince by his people: A trust, that is more than equivalent to a thousand little troublesome prerogatives.

Add to all this, that, besides the civil list, the immense revenue of almost seven millions sterling, which is annually paid to the creditors of the public, or carried to the sinking fund, is first deposited in the royal exchequer, and thence issued out to the respective offices of payment. This revenue the people can never refuse to raise, because it is made perpetual by act of parliament: which also, when well considered, will appear to be a trust of great delicacy and high importance.

Upon the whole, therefore, it seems clear, that, whatever may have become of the *nominal*, the real power of the crown has not been too far weakened by any transactions in the last century. Much is indeed given up; but much is also acquired. The stern commands of prerogative have yielded to the milder voice of influence: the slavish and exploded doctrine of non-resistance has given way to a military establishment by law; and to the dilute of parliaments has succeeded a parliamentary trust of an immense perpetual revenue. When, indeed, by the free operation of the sinking fund, our national debts shall be lessened; when the posture of foreign affairs, and the universal introduction of a well-planned and national militia, will suffer our formidable army to be thinned and regulated; and when (in consequence of all) our taxes shall be gradually reduced; this adventitious power of the crown will slowly and imperceptibly diminish, as it slowly and imperceptibly rose. But, till that shall happen, it will be our especial duty, as good subjects and good Englishmen, to reverence the crown, and yet guard against corrupt and servile influences from those who are intrusted with its authority; to be loyal, yet free; obedient, and yet independent; and above every thing, to hope that we may long, very long, continue to be governed by a sovereign, who, in all those public acts that have personally proceeded from himself, hath manifested the highest veneration for the free constitution of Britain; hath already in more than one instance remarkably strengthened its outworks; and will therefore never harbour a thought, or adopt a persuasion, in any the remotest degree detrimental to public liberty.

KING (Dr John), a learned English bishop in the 17th century, bred at Westminster-school, and afterward at Christ-church Oxford. He was appointed chaplain to queen Elizabeth. In 1605, he was made dean of Christ-church, and was for several years vice-chancellor of Oxford. In 1611, he was advanced to the bishopric of London. Besides his *Lectures upon*

*Jonah*, delivered at York, he published several sermons. King James I. used to style him *the king of preachers*; and lord chief justice Coke often declared, that he was *the best speaker in the star-chamber in his time*. He was so constant in preaching after he was a bishop, that, unless he was hindered by want of health, he omitted no Sunday whereon he did not visit some pulpit in London or near it. Soon after his death, the Papists reported, that he died a member of their church. But the falsity of this story was sufficiently exposed by his son Mr Henry King, in a sermon at St Paul's cross soon after; by bishop Godwin in the *Appendix to his Commentarius de præsulibus Angliæ*, printed in 1622; and by Mr John Gee, in his book intitled, *The foot out of the snare*.

KING (Dr Henry), bishop of Chichester, eldest son of the former, was born in 1591, and educated at Oxford. He became an eminent preacher, and chaplain to king James I. and Charles I. In 1638, he was made dean of Rochester; and, in 1641, was advanced to the see of Chichester. Upon the breaking out of the civil wars, and the dissolution of episcopacy, he was treated with great severity by the friends to the parliament; but recovered his bishopric at the restoration. This worthy prelate, who had a most amiable character, died in 1699; and was interred at his cathedral of Chichester, where a monument was erected to his memory. He published, 1. *The palms of David turned into metre*. 2. *Poems, elegies, paradoxes, and sonnets*. 3. *Several sermons, and other works*.

KING (Dr William), a facetious English writer in the beginning of the 18th century, was well descended, being allied to the noble families of Clarendon and Rochester. He was elected a student of Christ-church from Westminster-school in 1681, aged 18. He afterward entered upon the law line, and took the degree of doctor of civil law. He soon acquired a considerable reputation as a civilian, and was in great practice. He attended the earl of Pembroke, lord lieutenant of Ireland, into that kingdom, where he was appointed judge-advocate, sole commissioner of the prizes, keeper of the records, vicar-general to the lord primate of Ireland; was countenanced by persons of the highest rank, and might have made a fortune. But so far was he from heaping up riches, that he returned to England with no other treasure than a few merry poems and humorous essays, and retired to his student's place at Christ-church. He died on Christmas-day in 1712, and was interred in the cloisters of Westminster-abbey. His writings are pretty numerous. The principal are, *Animadversions on a pretended account of Denmark*, wrote by Mr Moleworth, afterwards lord Moleworth. The writing of these procured Dr King the place of secretary to princeps Anne of Denmark. 2. *Dialogues of the dead*. 3. *The art of love*, in imitation of Ovid *De arte amandi*. 4. *A volume of poems*. 5. *Useful transactions*. 6. *An historical account of the heathen gods and heroes*. 7. *Several translations*.—As to the character of Dr King, he naturally hated business, especially that of an advocate; but made an excellent judge when appointed one of the court of delegates. His chief pleasure consisted in trifles; and he was never happier than when he thought he was hid from the world. Yet he loved company, provided they

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King. they were such as tallied with his humour. He would say a great many ill-natured things, but never do one. He was made up of tenderness and pity, and tears would fall from him on the smallest occasion. His education had been strict, and he was naturally of a religious disposition.

KING (Dr William), archbishop of Dublin in the 18th century, was descended from an ancient family in the north of Scotland, but born in the county of Antrim in the north of Ireland. In 1674, he went into priests orders. In 1679, he was promoted by his patron, Dr Parker, archbishop of Dublin, to the chancellorship of St Patrick. In 1687, Peter Manby, dean of Londonderry, having published at London in 4to, a pamphlet intitled *Considerations which obliged Peter Manby dean of Londonderry to embrace the Catholic religion*, our author immediately wrote an answer. Mr Manby, encouraged by the court, and assisted by the most learned champions of the church of Rome, published a reply under this title, *A reformed catechism, in two dialogues concerning the English reformation, &c. in reply to Mr King's answer, &c.* Our author soon rejoined in *A vindication of the answer*. Mr Manby dropped the controversy; but dispersed a loose sheet of paper, artfully written, with this title, *A letter to a friend, shewing the vanity of this opinion, that every men's sense and reason are to guide him in matters of faith*. This Dr King refuted in "A vindication of the Christian religion and reformation, against the attempts of a letter, &c." In 1689, he was twice confined in the tower by order of king James II. and the same year commenced doctor of divinity. In 1690, upon king's James's retreat to France after the battle at the Boyne, he was advanced to the see of Derry. In 1692, he published at London in 4to, *The state of the protestants of Ireland under the late king James's government, &c.* "A history, (says bishop Burnet,) as truly as it is finely written." He had by him at his death attested vouchers of every particular fact alleged in this book, which are now in the hands of his relations. However, it was soon attacked by Mr Charles Lessly. In 1693, our author finding the great number of Protestant dissenters, in his diocese of Derry, increased by a vast addition of colonies from Scotland, in order to persuade them to conformity to the established church, published *A discourse concerning the inventions of men in the worship of God*. Mr Joseph Boyfe, a dissenting minister, wrote an answer. The bishop answered Mr Boyfe. The latter replied. The bishop rejoined. In 1702, he published at Dublin in 4to, his celebrated treatise *De origine mali*. Mr Edmund Law, M. A. fellow of Christ's college in Cambridge, afterward published a complete translation of this, with very valuable notes, in 4to. In the second edition he has inserted, by way of notes, a large collection of the author's papers on the same subject, which he had received from his relations after the publication of the former edition. Our author, in this excellent treatise, has many curious observations. He asserts and proves, that there is more moral good in the earth than moral evil. A sermon by our author, preached at Dublin in 1709, was published under the title of *Divine predestination and foreknowledge consistent with the freedom of man's will*. This was attacked by Anthony Collins, esq; in a

pamphlet intitled, "*A vindication of the divine attributes*"; in some remarks on the archbishop of Dublin's sermon intitled, *Divine predestination, &c.*" He published likewise, *A discourse concerning the consecration of churches; shewing what is meant by dedicating them, with the grounds of that office*. He died in 1729.

KING (Dr William), late principal of St Mary's-hall Oxford, son of the reverend Peregrine King, was born at Stepney in Middlesex, in the year 1685. He was made doctor of laws in 1715, was secretary to the duke of Ormond, and earl of Arran, as chancellors of the university; and was made principal of St Mary's-hall on the death of Dr Hudson in 1719. When he stood candidate for member of parliament for the university, he resigned his office of secretary, but enjoyed his other preferment, and it was all he did enjoy, to the time of his death. Dr Clark, who opposed him, carried the election; and after this disappointment, he, in the year 1727, went over to Ireland, where he is said to have written an epic poem, called *The toads*, which was a political satire, printed and given away to his friends, but never sold. On the dedication of Dr Radcliff's library in 1749, he spoke a Latin oration in the theatre at Oxford, which was received with the highest acclamations; but it was otherwise when printed, he being attacked in several pamphlets on account of it. Again, at the memorable contested election in Oxfordshire 1755, his attachment to the old interest drew on him the resentment of the new, and he was libelled in newspapers and pamphlets, against which he defended himself in an *Apology*, and warmly retaliated on his adversaries. He wrote several other things, and died in 1762. He was a polite scholar, an excellent orator, an elegant and easy writer, and esteemed by the first men of his time for his learning and wit.

KING (Peter), lord high-chancellor of Great Britain, was descended of a good family of that name in Somersetshire, and son to an eminent grocer and falter in the city of Exeter in Devonshire. He was born at Exeter in 1669, and bred up for some years to his father's business; but his inclination to learning was so strong, that he laid out all the money he could spare in books, and devoted every moment of his leisure hours to study; so that he became an excellent scholar before the world suspected any such thing; and gave the public a proof of his skill in church-history, in his *Inquiry into the constitution, discipline, unity, and worship, of the primitive church, that flourished within the first 300 years after Christ*, London, 1691, in 8vo. This was written with a view to promote the scheme of a comprehension of the dissenters. He afterwards published the second part of the *Inquiry into the constitution, &c.* and having desired, in his preface, to be shewn, either publicly or privately, any mistakes he might have made, that request was first complied with by Mr Edmund Elys; between whom and our author there passed several letters upon the subject, in 1692, which were published by Mr Elys in 1694, 8vo, under the title of *Letters on several subjects*. But the most formal and elaborate answer to the *Inquiry* appeared afterwards in a work entitled, *Original draught of the primitive church*.

His acquaintance with Mr Locke, to whom he was related, and who left him half his library at his death,

**King.** was of great advantage to him : by his advice, after he had studied some time in Holland, he applied himself to the study of the law ; in which profession his learning and diligence made him soon taken notice of. In the two last parliaments during the reign of king William, and in five parliaments during the reign of queen Anne, he served as burgess for Beer-Alston in Devonshire. In 1702, he published at London, in 8vo, without his name, his *History of the apostles creed*, with critical observations on its several articles ; which is highly esteemed. In 1708, he was chosen recorder of the city of London ; and in 1710, was one of the members of the house of commons at the trial of Dr Sacheverell. In 1714, he was appointed lord chief justice of the common-pleas ; and, the April following, was made one of the privy-council. In 1715, he was created a peer, by the title of *Lord King, baron of Ockham in Surrey*, and appointed lord high chancellor of Great Britain ; in which post he continued till 1733, when he resigned ; and in 1734 died at Ockham in Surrey.

**KING at Arms, or of Arms**, is an officer of great antiquity, and anciently of great authority, whose business is to direct the heralds, preside at their chapters, and have the jurisdiction of armoury.

In England there are three kings of arms, viz. garter, clarencieux, and norroy.

**Garter**, principal **KING at arms**, was instituted by Henry V. His business is to attend the knights of the garter at their assemblies, to marshal the solemnities at the funerals of the highest nobility, and to carry the garter to kings and princes beyond the sea ; on which occasion he used to be joined in commission with some principal peer of the kingdom. See **GARTER**.

**Clarencieux KING at Arms**, is so called from the duke of Clarence, to whom he first belonged. His office is to marshal and dispose the funerals of all the inferior nobility, as baronets, knights, esquires, and gentlemen, on the south side of the Trent. See **CLARENCIEUX**.

**Norroy KING at Arms**, is to do the same on the north side of the river Trent.

These two last are also called *provincial heralds*, in regard they divide the kingdom between them into provinces. By charter, they have power to visit noblemen's families, to set down their pedigrees, distinguish their arms, appoint persons their arms, and with garter, to direct the other heralds.

Anciently, the kings at arms were created, and solemnly crowned, by the kings of England themselves ; but of later days, the earl marshal has a special commission, at every creation, to perorate the king.

**Lyon KING at Arms**, for Scotland, is the second king at arms for Great Britain ; he is invested and crowned with great solemnity. To him belongs the publishing the king's proclamations, marshalling funerals, reversing arms, &c. See **LYON**.

**KING's-Bench**. This court (the nature of which was partly explained before) is divided into a *crown side* and a *plea side*. See **KING's-BENCH**. And on the crown side, or crown office, it takes cognizance of all criminal causes, from high treason down to the most trivial misdemeanour or breach of the peace. Into this court also indictments from all inferior courts may be

removed by writ of *certiorari* ; and tried either at bar, or at *nisi prius*, by a jury of the county out of which the indictment is brought. The judges of this court are the supreme coroners of the kingdom. And the court itself is the principal court of criminal jurisdiction known to the laws of England. For which reason, by the coming of the court of King's bench into any county, (as it was removed to Oxford on account of the sickness in 1665), all former commissions of *oyer and terminer*, and general gaol-delivery, are at once absorbed and determined *ipso facto* : in the same manner as, by the old Gothic and Saxon constitutions, *Jure vetusto obtinuit, quicquid omnia inferiora judicis, dicente suo rege*. Into this court of King's bench hath reverted all that was good and salutary of the *star-chamber*. See **STAR-CHAMBER**.

**KINGDOM**, the territories or extent of country subject to a king.

**KINGDOMS**, in natural history. Most naturalists and chemists divide all natural bodies into three great classes, which they call *kingdoms*. These are the *mineral*, the *vegetable*, and the *animal* kingdoms.

This great and first division is founded on this consideration, that any plant or vegetable which is produced, which grows, which is organized, which contains a feed, and which produces its like, seems to be a being very distinct and different from a stone or a metal, in which we at most observe only a regular arrangement of parts, but not a true organization, and which contains no seed by which it is capable of reproduction ; and another foundation of this division is, that an animal differs no less from a simple plant, by sensation, by the use of its senses, and by the power of voluntary motion which it possesses, while these qualities do not belong to any thing which is merely vegetable.

But notwithstanding these so distinctive marks, philosophers pretend, that this division of natural bodies into classes is only ideal. They affirm, that, by observing nature attentively, we may perceive, that all her productions are connected together by an uninterrupted chain ; and that by surveying the several beings, we must be convinced, that any one being differs very little from some other two between which it seems to be placed ; so that we may descend from the most perfect animal to the rudest mineral by insensible degrees, and without finding any interval from which a division might be made. The opinions of naturalists are therefore divided upon this subject ; and each opinion seems to be founded upon observations, analogies, and reasonings, more or less conclusive.

If we avoid investigating extremes, however, the distinctive marks must be acknowledged sufficiently obvious to justify the triple division above mentioned, and to discriminate the individuals of each.

For a general view of the operations or conduct of nature in these her three kingdoms, see the article **NATURE**. For a particular consideration of them,—(in the animal-kingdom), see **ZOOLOGY**, **ANIMAL**, **BRUTE**, **BIRD**, **ORNITHOLOGY**, **FISH**, **COMPARATIVE ANATOMY**, and the different animals under their respective names ;—(in the vegetable kingdom), **BOTANY**, **PLANT**, **AGRICULTURE**, **VEGETATION**, **DEFOLIATION**, **FRONDESCENTIA**, **GEMMATIO**, **FRUIT**, **LEAF**, **GERMINATION**, &c. and the different plants under their



Kingdom. their respective names;—(in the mineral kingdom), MINERALOGY, METALLURGY, and the different stones and metals under their respective names.

In what remains of this article we shall consider natural bodies only in a chemical view; that is to say, relatively to the several principles which we obtain in the analysis of those bodies. In the decomposition of all beings truly living, organized, and containing within themselves a feed by which they may be reproduced, such as vegetables and animals, we always obtain an inflammable, fat, or oily substance; and on the contrary, we do not find the smallest trace of this principle in any substance purely mineral, not even in sulphur, which is the most inflammable of all these substances. On the other side, if we carefully examine and compare with each other the analogous principles obtained from the three kingdoms; such as the saline substances obtained in the analysis of animals, vegetables, and minerals; we shall easily perceive, that all the saline matter which comes from the vegetable or animal kingdoms is altered by oil, while all the saline matter which comes from the mineral kingdom is entirely free from oil.

We ought to observe here, that because any matter is found in one or more individuals of any kingdom, we must not therefore conclude, that it belongs to the kingdom of such individuals; for we may be convinced, from a slight observation of nature, that by a thousand combinations, and particular circumstances, substances of quite different classes or kingdoms are daily found mixed and confounded together. Thus, for example, within the earth, and even at great depths, that is, in the region appropriated to minerals, sometimes substances are found evidently oily, such as all bitumens; but we at the same time can prove, and all the observations of natural history prove, that these oily substances are only accidentally within the earth, and that they proceed from the vegetable or animal bodies which have been buried in the earth by some of those great revolutions which have happened from time to time upon the surface of our globe. Also in decomposing several vegetables and animals, salts are obtained; such as common salt, Glauber's salt, and others, which contain nothing oily, and which are consequently matters evidently mineral. But, on the other side, we are certain that these mineral salts are extraneous to the animals and vegetables in which they are found; that they are only introduced into these living bodies, because they happen to be mixed with the matters which have been applied to them as aliments, and that they ought not to be numbered amongst their principles. The proof of this is, that not only the quantity of these mineral salts is not uniform in animals and vegetables; but also, that not a particle of such salts is contained in some plants and animals equally strong and healthy, and of the same species as those in which these salts have generally been observed.

In the second place, we observe, that oils do only exist in the proximate principles of vegetables and animals; that is, in those of their principles which enter immediately into their composition, when these principles have not been altered by further decompositions, and consequently when they still preserve their animal or vegetable character; for by a natural putrefaction continued during a long time, or by chemical opera-

tions, not only the materials of which animal and vegetable bodies are formed may be deprived entirely of oil, but also this oil may itself be entirely destroyed or decomposed. These substances in that state contain nothing by which they can be distinguished from minerals. The earths, for example, of vegetables and animals, when they are deprived, by a sufficient calcination, of all inflammable matter, have been thought to become entirely similar to the calcareous and argillaceous earths found within the globe, and which may be considered as mineral substances, although probably they have been formerly a part of animal and vegetable bodies. See BONES, in the APPENDIX.

Hence we conclude, that, when we consider natural bodies in a chemical view, we ought to divide them into two great classes. The first class is of substances inanimate, unorganized, and the principles of which have a degree of simplicity which is essential to them: these are minerals. The other class contains all those bodies which not only have been distinctly organized, but which also contain an oily matter, which is no where to be found in substances which have not made part of animate bodies, and which, by combining with all the other principles of these animate bodies, distinguishes these principles from those of minerals by a less degree of simplicity. This second class contains vegetables and animals. We ought also to remark, that the oil contained in vegetable and animal substances, renders them susceptible of fermentation, properly so called, which cannot by any means take place in any mineral.

We shall now proceed to examine, if, by comparing the principles obtained in the decomposition of vegetables with those obtained in the decomposition of animals, we can find some essential character by which these two kingdoms may be chemically distinguished, in the same manner as we have seen that both of them may be distinguished from minerals. From experiments we indeed learn, that the principles of vegetables differ evidently enough from those of animals; that in general the saline principles of the former are acid, and are transformable in great measure into fixed alkali by incineration, while the principle of the latter are volatile alkalis, or easily changeable into these; that vegetables are much farther removed from putrefaction than animals; lastly, that oils truly animal have a character different from vegetable oils, and are in general more attenuated, or at least more disposed to be attenuated and volatilized. But we must at the same time confess, that these differences are not clear and decisive, like those betwixt these two kingdoms and the mineral kingdom; for we do not find any essential principle, either in animals or in vegetables, which is not also to be found in the other. In some plants, chiefly the cruciform, as much volatile alkali, as little fixed alkali, and as much disposition to putrify, are found as in animal matters; and thence we conclude, that if these two great classes of natural bodies differ chemically from each other, this difference proceeds only from the quantities or proportions of their several principles and properties, and not from any thing distinct and peculiar; nor is it similar to the manner in which both vegetable and animal substances differ from minerals, namely, by containing an oil, and possessing a fermentable quality. Besides, the degrees of the chemi-

King's  
Kingdon.

cal differences betwixt these three great classes of natural bodies are found to be the same, in whatever manner we consider them or compare them together. See *CHEMISTRY, passim*.

*Books of Kings*, two canonical books of the Old Testament, so called because they contain the history of the kings of Israel and Judah, from the beginning of the reign of Solomon, down to the Babylonish captivity, for the space of near 600 years.—It is probable that these books were composed by Ezra, who extracted them out of the public records, which were kept of what passed in that nation.

*KING'S-County*, a county of the province of Leinster in Ireland, taking its name from king Philip of Spain, husband to queen Mary. It is bounded on the north by West Meath; on the south by Tipperary and Queen's county, from which it is divided by the Barrow; and part of Tipperary and Galway on the west, from which it is separated by the Shannon. The length of it is about 40 miles, and the breadth about 20. This county was formerly full of bogs, but is now well drained and inhabited. It contains 11 baronies, and sends six members to parliament, viz. two for the county, and four for Philip's-town and Banatur.

*KING'S-Evil*. See (the *Index* subjoined to) *MEDICINE*.

*KINGHORN*, a town the county of Fife in Scotland, on the frith of Forth, directly opposite to Leith. Here is a manufacture of thread-stocks knit by the women; the men, being chiefly mariners, are employed in coasting ships, in the fishery, or the passage-boats from hence to Leith, from which the town of Kinghorn derives considerable advantage. This place gives a second title to the earl of Strathmore.

*KINGSTON*, a town of Surry in England, situated in W. Long. 0. 21. N. Lat. 51. 28. It takes its name from having been the residence of many of the Saxon kings, some of whom were crowned here. It is situated on the river Thames, over which there is here a wooden bridge of 20 arches, and here the summer assizes are generally held. Medals and coins of several Roman emperors are often found about this place; and east from it, upon a gravelly hill, was a burying-place of the Romans. There are several springs in the neighbourhood, whence water is conveyed in leaden-pipes under the Thames to Hampton-court. From another spring in a cellar near the town, flows a brook so large, that it has a bridge over it at Kingston. The town is large; and has a good market for corn, a free-school erected and endowed by queen Elizabeth, an alms-house founded by alderman Cleave of London, a spacious church with eight bells. In this church the pictures of Athelstan, Ethelred I. and II. Edwin, and Edward the Martyr, who were crowned here, and of king John, who gave the town its first charter, are preserved.

*KINGSTON*, a town of Ireland, in the province of Leinster, and capital of King's county. W. Long. 7. 20. N. Lat. 53. 15. It is otherwise called *Philipstown*.

*KINGSTON*, a town of Jamaica, in America, seated on the north side of the bay of Port-royal. It was built after the great earthquake in 1692; and is now a large thriving place, about a mile in length, and half a mile in breadth. It is laid out into little squares and cross-streets, and has one church. The Jews have two

synagogues here, and the Quakers a meeting-house. It is a place of good trade; and is much resorted to by merchants and seamen, because most of the ships come to load and unload their cargoes here. W. Long. 75. 52. N. Lat. 17. 40.

*KINGTON*, or *KYNETON*, a pretty large town in Herefordshire, with a good trade in narrow cloths. W. Long. 3. 5. N. Lat. 52. 10.

*KINROSS*, a town of the county of Fife in Scotland, situated in W. Long. 3. 7. N. Lat. 56. 15. on the west side of Lochleven, a fresh-water lake about 10 miles in compass, abounding with pike, trout, perch, and water-fowl. In the lake are two islands; on one of which appear the ruins of a priory, heretofore possessed by the Culdees; the other is famous for the castle in which queen Mary was imprisoned by her rebellious subjects. See (*History* of) *SCOTLAND*.

*KINSALE*, a town of the county of Cork in Ireland, situated at the mouth of the river Ban, or Bandon, in W. Long. 8. 20. N. Lat. 51. 32. It is reckoned the third town in the kingdom, and inferior only to Cork in point of trade. Vast quantities of provisions are shipped off from hence to Flanders, Holland, France, and the West Indies. The port indeed is barred, but ships of any burden may get over the bar at high water. On a point of land, called the *old head of Kinsale*, is a light-house to guide ships in the night to the mouth of the river. The town is neat, well built, wealthy, and extremely well fortified with lines and outworks. About two miles below the town are two strong forts, one on each side the river, which secure it against all attempts by sea. Kinsale gives the title of *baron* to the very ancient family of Courcy.

*KINTORE*, a royal borough of Aberdeenshire in Scotland, situated on the river Don, in W. Long. 2. 5. N. Lat. 57. 38. It gives the title of *earl* to a branch of the noble family of Keith, but in other respects is inconsiderable.

*KINTYRE*, or *CANTYRE*, from *Cantierre*, signifying a "headland;" the southern division of the shire of Argyle in Scotland. It is a peninsula, stretching 37 miles from north to south, and seven miles in breadth. It is mostly plain, arable, and populous; inhabited promiscuously by Highlanders and Lowlanders; the latter being invited to settle in this place by the Argyle family, that the lands might be the better cultivated. It gives the title of *marquis* to the duke, and is by Lochfyn divided from Argyle Proper. This loch is an inlet from the sea, about 60 miles in length and four in breadth, affording heretofore an excellent herring-fishery. There are many paltry villages in this country, but no town of any consequence except Campbeltown.

*KIOF*, or *KIOU*, a considerable town of Poland, and capital of the Ukrain, in the palatinate of the same name, with an archbishop's-see and a castle. It belongs to Russia, and carries on a considerable trade. It is divided into the Old and New Town; and seated on the river Nieper, in E. Long. 31. 51. N. Lat. 50. 12.

*KIPPING* (Henry), in Latin *Kippingius*, a learned German Lutheran, born at Bollock; where, after having received the degree of master of arts, he was met by some soldiers, who pressed him into the service. This, however, did not prevent his following his studies. One day while he was upon duty, holding his musket

Kingdon  
Kipping.



Kirk  
  
 Kirk.

musket in one hand, and the poet Statius in the other, a Swedish counsellor, who perceived him in that attitude, came up to him, entered into discourse with him, and then taking him to his house, made him his librarian, and procured him the under-rector of the college of Bremen, where he died in 1678. He wrote many works in Latin; the principal of which are, 1. A treatise on the antiquities of the Romans. 2. Another on the works of Creation. 3. Several dissertations on the Old and New Testament, &c.

KIRCH (Christian Frederic), of Berlin, a celebrated astronomer, was born at Guben in 1694; and acquired great reputation in the observatories of Dantzic and Berlin. Godfrey Kirch his father, and Mary his mother, acquired considerable reputation by their astronomical observations. This family corresponded with all the learned societies of Europe; and their astronomical works are in high repute.

KIRCHER (Athanasius), a famous philosopher and mathematician, was born at Fulde in 1601. In 1618 he entered into the society of the Jesuits; and taught philosophy, mathematics, the Hebrew and Syriac languages, in the university of Wirtzburg, with great applause till the year 1631. He went to France, on account of the ravages committed by the Swedes in Franconia, and lived some time at Avignon. He was afterwards called to Rome, where he taught mathematics in the Roman college, collected a rich cabinet of machines and antiquities, and died in 1680.—The quantity of his works is immense; amounting to 22 vols in folio, 11 in 4to, and 3 in 8vo; enough to employ a man for a great part of his life even to transcribe them. Most of them are rather curious than useful; many of them visionary and fanciful; and if they are not always accompanied with the greatest exactness and precision, the reader, it is presumed, will not be astonished. The principal of his works are, 1. *Prælectiones magneticæ*. 2. *Primitia gnomonica catoptrica*. 3. *Arts magna lucis & umbræ*. 4. *Musurgia universalis*. 5. *Obeliscus Pamphilus*. 6. *Oedipus Egyptiacus*, four volumes, folio. 7. *Itinerarium extaticum*. 8. *Obeliscus Egyptiacus*, in four volumes, folio. 9. *Mundus subterraneus*. 10. *China illustrata*.

KIRCHMAN (John), an eminent German divine, was born at Lubec, in 1575. He studied in several places of Germany; in 1602 was made professor of poetry at Rostock, and in 1613 rector of the university at Lubec. He exercised this last employment with an extraordinary application, during the rest of his life; and died in 1643. He wrote several works; the most esteemed of which are, 1. *De funeribus Romanorum*. 2. *De annulis liber singularis*.

KIRIATHAIM, (anc. geog.), one of the towns built by the Reubenites; reckoned to the tribe of Reuben (Joshua xiii.), 12 miles to the west of Midaba. The ancient residence of the giants called *Emin*.

KIRIATH-ARBA. See *HEBRON*.

KIRK, a Saxon term, signifying the same with church.

KIRK-Oswald, a market-town of Cumberland, 12 miles south of Carlisle.

KIRK-Session, an inferior church-judicatory in Scotland, consisting of the ministers, elders, and deacons of a parish.

It regulates matters relating to public worship, catechising, visitations, &c. and judges in case of fornication and lesser scandals.

Kirkaldy  
  
 Kirstenius.

KIRKALDY, a town of the county of Fife in Scotland, two miles to the north-east of Kinghorn. It is a royal borough, the seat of a presbytery, and gives the title of *baron* to the earl of Melville. The town is populous, well built, and extends a mile in length from east to west, enjoying a tolerable share of trade by exporting its own produce and manufactures of corn, coal, linen, and salt. W. Long. 3. o. N. Lat. 56. 8.

KIRKCUDBRIGHT, beginning at the middle of Dumfriesshire in Scotland, makes a considerable part of Galloway, of which the earls of Nithsdale were hereditary stewards. The face of the country exhibits the appearance of one continued heath, producing nothing but pasture for sheep and small black cattle, which are generally fold in England; yet these dusky moors are intersected with pleasant valleys, and adorned with a great number of castles belonging to private gentlemen, every house being surrounded with an agreeable plantation. It is watered by the river Dee; which, taking its rise from the mountains near Carrick, runs through a tract of land about 70 miles in length, and, entering the Irish sea, forms the harbour of Kirkcudbright, a small inconsiderable borough, admirably situated for the fishery and other branches of commerce, which are almost totally neglected thro' the poverty and indolence of the inhabitants. There is no other town of any consequence in this shewartry.

KIRSTENIUS (Peter), professor of physic at Upsal, and physician extraordinary to the queen of Sweden, was born at Breslaw in 1577. He studied Greek, Latin, Hebrew, Syriac, natural philosophy, anatomy, botany, and other sciences. Being told that a man could not distinguish himself in physic, unless he understood Avicenna, he applied himself to the study of Arabic; and not only to read Avicenna, but also Mesue, Rhasis, Abenzoar, Abukasis, and Averroes. He visited Spain, Italy, England, and did not return home from his travels till after seven years. He was chosen by the magistrates of Breslaw to have the direction of their college and of their schools. A fit of sickness having obliged him to resign that difficult employment, with which he was also much disgusted, he applied himself chiefly to the practice of physic, and went with his family into Prussia. Here he obtained the friendship and esteem of the chancellor Oxenstiern, whom he accompanied into Sweden; where he was made professor of physic in the university of Upsal, and physician to the queen. He died in 1640. It is said in his epitaph, that he understood 26 languages. He wrote many works; among which are, 1. *Liber secundus Canonis Avicennæ, typis Arabicis, ex MSS. editus, et ad verbum in Latinum translatus*, in folio. 2. *De vero usu et abusu Medicinæ*. 3. *Grammatica Arabica*, folio. 4. *Vite quatuor Evangelistarum, ex antiquissimo codice MSS. Arabico erute*, in folio. 5. *Nota in Evangelium S. Matthæi, ex collatione textuum Arabicorum, Syriacorum, Ægyptiacorum, Græcorum, & Latinorum*, in folio, &c.

He ought not to be confounded with George Kirstenius, another learned physician and naturalist, who was born at Stettin, and died in 1660; and also wrote several

Kit-kat  
Kitchen.

several works which are esteemed.

**KIT-KAT CLUB**, an association of above 30 noblemen and gentlemen of distinguished merit, formed in 1703, purely to unite their zeal in favour of the protestant succession in the house of Hanover. Their name was derived from Christopher Kat a pastry-cook, near the tavern where they met in King's-street Westminster, who often supplied them with tarts. Old Jacob Tonson was their bookseller; and that family is in possession of a picture of the original members of this famous club, painted by Sir Godfrey Kneller. The design of these gentlemen was to recommend and encourage true loyalty by the powerful influence of wit and humour; and Sir Samuel Garth distinguished himself by the extempore epigrams he made on their toasts, which were inscribed on their drinking-glasses.

**KIRKWALL**, the capital of the Orkneys, situated in the island of Pomona, in W. Long. o. 25. N. 58. 33. It is built upon an inlet of the sea, near the middle of the island, having a very safe road and harbour for shipping. It is a royal borough, governed by a provost, four bailiffs, and a common-council. It was formerly possessed by the Norwegians, who bestowed upon it the name of *Cruccviaca*. From king James III. of Scotland, they obtained a new charter, empowering them to elect their own magistrates yearly, to hold borough-courts, arrest, imprison, make laws and ordinances for the right government of the town; to have a weekly market, and three fairs annually at certain fixed terms: he moreover granted to them some lands adjoining to the town, with the customs and shore-dues, the power of a pit and gallows, and exempted them from the expence of sending commissioners to parliament. This charter has been confirmed by succeeding monarchs. At present Kirkwall is the seat of justice, where the steward, sheriff, and commissary, hold their several courts of jurisdiction: Here is likewise a public grammar-school, endowed with a competent salary for the master. The town consists of one narrow street about a mile in length; the houses are chiefly covered with slate, tho' not at all remarkable for neatness and convenience.—The principal edifices are the cathedral church, and the bishop's palace. The former, called *St Magnus*, from Magnus king of Norway, the supposed founder of the town, is a large gothic structure: the roof is supported by 14 pillars on each side, and the spire is built upon four large columns. The gates are decorated with a kind of mosaic work, of red and white stones elegantly carved and flowered. By the ruins of the king's castle, or citadel, it appears to have been a strong and stately fortress. At the north end of the town there is a sort of fortification built by the English in the time of Oliver Cromwell. It is surrounded with a ditch and rampart, and still mounted with some cannon for the defence of the harbour.

**KITCHEN**, the room in a house where the provisions are cooked.

*Army KITCHEN*, is a space of about 16 or 18 feet diameter, with a ditch surrounding it three feet wide; the opposite bank of which serves as a seat for the men who dress the viands. The kitchens of the flank companies are contiguous to the outline of the camp; and the intermediate space is generally distributed equally

for the remaining kitchens; and as each tent forms a mesa, each kitchen must have as many fire-places as there are tents in the company.

**KITCHEN-Garden**, a piece of ground laid out for the cultivation of fruit, herbs, pulse, and other vegetables used in the kitchen.

A kitchen-garden ought to be situated on one side of the house, near the stables, from whence the dung may be easily conveyed into it; and after having built the wall, borders should be made under them; which, according to Miller, ought to be eight or ten feet broad: upon those borders exposed to the south, many sorts of early plants may be sown; and upon those exposed to the north, you may have some late crops, taking care not to plant any sort of deep-rooting plants, especially beans and pease, too near the fruit-trees. You should next proceed to divide the ground into quarters: the best figures for these is a square, or an oblong, if the ground will admit of it; otherwise they may be of that shape which will be most advantageous to the ground: the size of these quarters should be proportioned to that of the garden; if they are too small, your ground will be lost in walks, and the quarters being inclosed by espaliers of fruit-trees, the plants will draw up slender, for want of a more open exposure. The walks should also be proportioned to the size of the ground: these in a small garden should be six feet broad, but in a large one ten; and on each side of the walk there should be allowed a border three or four feet wide, between it and the espalier; and in these borders may be sown some small salads, or any other herbs that do not take deep root or continue long: but these quarters should not be sown or planted with the same crop two years together. In one of these quarters, situated nearest to the stables, and best defended from the cold winds, should be the hot-beds, for early cucumbers, melons, &c. and to these there should be a passage from the stables, and a gate through which a small cart may enter. The most important points of general culture consist in well digging and manuring the soil; and giving a proper distance to each plant, according to their different growths: as also in keeping them clear from weeds; for which purpose, you should always observe to keep your dung-hills clear from them, otherwise their seeds will be constantly brought in and spread with the dung.

**KLEIST** (Edward Christian de), a celebrated German poet, and a soldier of distinguished bravery, was born at Zeblin, in Pomerania, in 1715. At nine years of age he was sent to pursue his studies at Cron in Poland; and he afterwards studied at Dantzick and Konigsberg. Having finished his studies, he went to visit his relations in Denmark, who invited him to settle there; and having in vain endeavoured to obtain preferment in the law, at 21 years of age accepted of a post in the Danish army. He then applied himself to the study of all the sciences that have a relation to military affairs, with the same assiduity as he had before studied civil law. In 1740, at the beginning of the reign of Frederic king of Prussia, Mr de Kleist went to Berlin, and was presented to his Majesty, who made him Lieutenant of his brother prince Henry's regiment; and he was in all the campaigns

Kitchen.  
Kleist.

**Kleist.** paigns which distinguished the five first years of the king of Prussia's reign. In 1749 he obtained the post of captain; and in that year published his excellent poem on the Spring. Before the breaking out of the last war, the king chose him, with some other officers at Potsdam, companion to the young prince Frederick-William of Prussia, and to eat at his table. In the first campaign, in 1756, he was nominated major of Haufen's regiment; which being in garrison at Leipzig, he had time to finish several new poems. After the battle of Rosbach, the king gave him, by an order in his own hand-writing, the inspection of the great hospital established at Leipzig. And on this occasion his humanity was celebrated by the sick and wounded of both parties, and his disinterestedness was equally admired by all the inhabitants of that city. In 1758, prince Henry coming to Leipzig, Mr Kleist desired to serve in his army with the regiment of Haufen, which was readily granted. Opportunities of distinguishing himself could not be wanting under that great officer, and he always communicated his courage to the battalion under his command. He also served that prince at the beginning of the campaign of 1759, when he was with him in Franconia, and in all the expeditions of that army, till he was detached with the troops under general de Fink to join the king's army. On the 12th of August was fought the bloody battle of Kunersdorf, in which he fell. He attacked the flank of the Russians, and assisted in gaining three batteries. In these bloody attacks he received twelve contusions; and the two first fingers of his right hand being wounded, he was forced to hold his sword in the left. His post of major obliged him to remain behind the ranks; but he no sooner perceived the commander of the battalion wounded and carried away, than he instantly put himself at the head of his troop. He led his battalion in the midst of the terrible fire of the enemies artillery, against the fourth battery. He called up the colours of the regiment; and, taking an ensign by the arm, led him on. Here he received a ball in his left arm; when, being no longer able to hold his sword in his left hand, he took it again in the right, and held it with the two last fingers and his thumb. He still pushed forward, and was within thirty steps of the battery when his right leg was shattered by the wadding of one of the great guns; and he fell from his horse, crying to his men, "My boys, don't abandon your king." By the assistance of those who surrounded him, he endeavoured twice to remount his horse; but his strength forsook him, and he fainted. He was then carried behind the line; where a surgeon, attempting to dress his wounds, was shot dead. The Coffees arriving soon after, stripped Mr Kleist naked, and threw him into a mirey place; where some Russian hussars found him in the night, and laid him upon some straw near the fire of the grand guard, covered him with a cloak, put a hat on his head, and gave him some bread and water. In the morning one of them offered him a piece of silver, which he refused; on which he tossed it upon the cloak that covered him, and then departed with his companions. Soon after the Coffees returned, and took all that the generous hussars had given him. Thus he again lay naked on the earth; and in that cruel situation continued till noon, when he was known by

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a Russian officer, who caused him to be conveyed in a waggon to Frankfort on the Oder; where he arrived in the evening, in a very weak state, and was instantly put into the hands of the surgeons. But the fractured bones separating, broke an artery, and he died by the loss of blood. The city of Frankfort being then in the hands of the enemy, they buried this Prussian hero with all military honours: the governor, a great number of the Russian officers, the magistrates of the city, with the professors and the students, formed the procession, preceded by the funeral music. Mr Kleist's poems, which are greatly admired, are elegantly printed in the German tongue, in 2 volumes 8vo.

**KNARESBOROUGH**, a town in the West Riding of Yorkshire in England. It is an ancient borough by prescription, governed by a bailiff, who, with the burgesses, elects the members of parliament, and its market is excellent for corn. This town is noted for its petrifying well, and three medicinal springs; one being a kind of vitriolic spaw, another sulphureous, and the other a cold bath, being all within a few miles. The adjacent fields afford great plenty of liquorice. It is seated on a rough ragged rock, by the river Nid, and is adorned with a castle. W. Long. 1. 6. N. Lat. 54. 0.

**KNAPDALE**, one of the divisions of Argyleshire in Scotland. It is parted from Cowal on the east by Lochfyn, borders with Kintyre on the south, with Lorn on the north, by Braidalbin on the north-east, and on the west by the Hebrides. Its length from north to south does not exceed 20 miles, and the breadth in some places may amount to 13. It is joined to Kintyre by a neck of land not above a mile broad, over which the country people draw their boats, to avoid sailing round Kintyre. This part of Knapdale abounds with lakes, some of them containing little islands, on which there are callies belonging to different proprietors. The ground is more adapted for pasturage than grain; but that on the side of Lochow is fruitful in both.

**KNAPSACK**, in a military sense, a rough leather bag which a soldier carries on his back, and which contains all his necessaries. Square knapsacks are most convenient; and should be made with a division to hold the shoes, black-ball and brushes, separate from the linen. White goat-skins are the best.

**KNAVE**, an old Saxon word, which had at first a sense of simplicity and innocence, for it signified a *boys* Sax. *cnapa*, whence a *knave-child*, i. e. a boy distinguished from a girl, in several old writers; afterwards it was taken for a servant-boy, and at length for any servant-man. Also it was applied to a minister or officer that bore the shield or weapon of his superior; as *field-knave*, whom the Latins call *armiger*, and the French *escuyer*, 14 Edw. III. c. 3. And it was sometimes of old made use of as a titular addition; as *Joannis C. filius Willielmi C. de Derby, knave, &c.* 22 Hen. VII. c. 37. The word is now perverted to the hardest meaning, viz. a *false deceitful fellow*.

**KNAVESHIP**, in Scots law, one of the names of the small duties payable in thirlage to the miller's servants, called *sequeis*.

**KNEE**, in anatomy, the articulation of the thigh and leg bones.

Knaref-  
borough  
|  
Knee.



**KNEE**, in a ship, a crooked piece of timber, having two branches, or arms, and generally used to connect the beams of a ship with her sides or timbers.

The branches of the knees form an angle of greater or smaller extent, according to the mutual situation of the pieces which they are designed to unite. One branch is securely bolted to one of the deck-beams, whilst the other is in the same manner attached to a corresponding timber in the ship's side, as represented by E in the plate of *MIDSHIP-FRAME*.

Besides the great utility of knees in connecting the beams and timbers into one compact frame, they contribute greatly to the strength and solidity of the ship, in the different parts of her frame to which they are bolted; and thereby enable her, with greater firmness, to resist the effects of a turbulent sea.

In fixing of these pieces, it is occasionally necessary to give an oblique direction to the vertical or side branch, in order to avoid the range of an adjacent gun-port, or, because the knee may be so shaped as to require this disposition; it being sometimes difficult to procure so great a variety of knees as may be necessary in the construction of a number of ships of war.

In France, the scarcity of these pieces has obliged their ship-wrights frequently to form their knees of iron.

Knees are either said to be *lodging* or *hanging*. The former are fixed horizontally in the ship's frame, having one arm bolted to the beam, and the other across two or three timbers, as represented in the *DECK*, Pl. LXXXIII. The latter are fixed vertically, as we have described above. See also *SHIP-BUILDING*, *DECK*, and *MIDSHIP-FRAME*.

**KNEE of the Head**, a large flat piece of timber, fixed edgewise upon the fore-part of a ship's stem, and supporting the ornamental figure or image placed under the bowsprit. See *SHIP-BUILDING*.

The *knee of the head*, which may properly be defined a continuation of the stem, as being prolonged from the stem forwards, is extremely broad at the upper-part, and accordingly composed of several pieces united into one, YY, (*Pieces of the Hull*, in *SHIP-BUILDING* Plates). It is let into the head, and secured to the ship's bows by strong knees fixed horizontally upon both, and called the *cheeks of the head*. The heel of it is scarfed to the upper-end of the fore-foot; and it is fastened to the stem above by a knee, called a *standard*, expressed by & in the plate.

Besides supporting the figure of the head, this piece is otherwise useful, as serving to secure the boom, or bumm, by which the fore-tack is extended to windward; and, by its great breadth, preventing the ship from falling to leeward when close-hauled, so much as the would otherwise do. It also affords a greater security to the bowsprit, by increasing the angle of the bob-stay, so as to make it act more perpendicularly on the bowsprit.

The *knee of the head* is a phrase peculiar to ship-wrights; as this piece is always called the *cut-water* by seamen, if we except a few, who, affecting to be wiser than their brethren, have adopted this expression probably on the presumption that the other is a cant-phrase or vulgarism.

*Carling KNEES*, in a ship, those timbers which ex-

tend from the ship to the hatch-way, and bear up the deck on both sides.

**KNELLER** (Sir Godfrey), a painter, whose fame is well established in these kingdoms. He was born at Lubeck in 1643; and received his first instructions in the school of Rembrandt, but became afterwards a disciple of Ferdinand Bol. When he had gained as much knowledge as that school afforded him, he travelled to Rome, where he fixed his particular attention on Titian and the Caracci. He afterwards visited Venice, and distinguished himself so effectually in that city by his historical pictures, and portraits of the noble families there, that his reputation became considerable in Italy. By the advice of some friends he came at last to England, where it was his good fortune to gain the favour of the duke of Monmouth: by his recommendation, he drew the picture of king Charles II. more than once; who was so taken with his skill in doing it, that he used to come and sit to him at his house in Covent-garden piazza. The death of Sir Peter Lely left him without a competitor in England, and from that time his fortune and fame were thoroughly established. No painter could have more incessant employment, and no painter could be more distinguished by public honour. He was state-painter to Charles II. James II. William III. queen Anne, and George I. equally esteemed and respected by them all: the emperor Leopold made him a knight of the Roman empire, and king George I. created him a baronet. Most of the nobility and gentry had their likenesses taken by him, and no painter excelled him in a sure outline, or in the graceful disposition of his figures: his works were celebrated by the best poets in his time. He built himself an elegant house at Whitton near Hampton-court, where he spent the latter part of his life; and died in 1726.

**KNIFE**, a well-known instrument, made for cutting.—All sorts of knives are prohibited to be imported.

**KNIGHT** (*equus*), among the Romans, a person of the second degree of nobility, following immediately that of the senators.

Part of the ceremony whereby this honour was conferred, was the giving of an horse; for each had an horse at the public charge, and received the stipend of a horseman to serve in the wars.

When the knights were taken in among the senators, they resigned the privilege of having an horse kept for them at the charge of the public: then it became necessary, in order to be a knight, that they should have a certain revenue, that their poverty might not disgrace the order; and when they failed of the prescribed revenue, they were expunged out of the list of knights, and thrust down among the Plebeians. Ten thousand crowns is computed to have been the revenue required.

The knights at length grow so very powerful, that they became a balance between the power of the senate and people: they neglected the exercises of war, and betook themselves principally to civil employments in Rome.

**KNIGHT**, or *Cnecht* (Germ.), in feudal history, was originally an appellation or title given by the ancient Germans to their youth after being admitted to the privilege of bearing arms.



Knight-  
hood.Knight-  
hood.\*View of So-  
cietv in En-  
rope, p. 46.

The passion for arms among the Germanic states, as described by Dr Stuart \*, was carried to extremity. It was amidst scenes of death and peril that the young were educated: It was by valour and feats of prowess that the ambitious signalized their manhood. All the honours they knew were allotted to the brave. The sword opened the path to glory. It was in the field that the ingenious and the noble flattered most their pride, and acquired an ascendancy. The strength of their bodies, and the vigour of their counsels, surrounded them with warriors, and lifted them to command.

But, among these nations, when the individual felt the call of valour, and wished to try his strength against an enemy, he could not of his own authority take the lance and the javelin. The admission of their youth to the privilege of bearing arms, was a matter of too much importance to be left to chance or their own choice. A form was invented by which they were advanced to that honour.

The council of the district, or of the canton to which the candidate belonged, was assembled. His age and his qualifications were inquired into; and, if he was deemed worthy of being admitted to the privileges of a soldier, a chieftain, his father, or one of his kindred, adorned him with the shield and the lance. In consequence of this solemnity, he prepared to distinguish himself; his mind opened to the cares of the public; and the domestic concerns, or the offices of the family from which he had sprung, were no longer the objects of his attention. To this ceremony, so simple and so interesting, the institution of *knighthood* is indebted for its rise.

Knighthood, however, as a system, known under the denomination of *CHIVALRY*, is to be dated only from the 11th century. All Europe being reduced to a state of anarchy and confusion on the decline of the house of Charlemagne, every proprietor of a manor or lordship became a petty sovereign; the mansion-house was fortified by a moat, defended by a guard, and called a *castle*. The governor had a party of 700 or 800 men at his command; and with these he used frequently to make excursions, which commonly ended in a battle with the lord of some petty state of the same kind, whose castle was then pillaged, and the women and treasures borne off by the conqueror. During this state of universal hostility, there was no friendly communications between the provinces, nor any high roads from one part of the kingdom to another: the wealthy traders, who then travelled from place to place with their merchandize and their families, were in perpetual danger; the lord of almost every castle extorted something from them on the road; and at last, some one more rapacious than the rest, seized upon the whole of the cargo, and bore off the women for his own use.

Thus castles became the warehouses of all kinds of rich merchandize, and the prisons of the distressed females whose fathers or lovers had been plundered or slain, and who being, therefore, seldom disposed to take the thief or murderer into favour, were in continual danger of a rape.

But as some are always distinguished by virtue in the most general defection, it happened that many lords insensibly associated to repress these sallies of vio-

lence and rapine, to secure property, and protect the ladies. Among these were many lords of great siefs; and the association was at length strengthened by a solemn vow, and received the sanction of a religious ceremony. As the first knights were men of the highest rank, and the largest possessions, such having most to lose, and the least temptation to steal, the fraternity was regarded with a kind of reverence, even by those against whom it was formed. Admission into the order was deemed the highest honour; many extraordinary qualifications were required in a candidate, and many new ceremonies were added at his creation. After having fasted from sun-rise, confessed himself, and received the sacrament, he was dressed in a white tunic, and placed by himself at a side-table, where he was neither to speak, to smile, nor to eat; while the knights and ladies, who were to perform the principal parts of the ceremony, were eating, drinking, and making merry at the great table. At night his armour was conveyed to the church where the ceremony was performed; and here having watched it till the morning, he advanced with his sword hanging about his neck, and received the benediction of the priest. He then kneeled down before the lady who was to put on his armour, who being assisted by persons of the first rank, buckled on his spurs, put an helmet on his head, and accoutred him with a coat of mail, a cuirass, bracelets, cuisses, and gauntlets.

Being thus armed cap-a-pee, the knight who dubbed him struck him three times over the shoulder, with the flat side of his sword, in the name of God, St Michael, and St George. He was then obliged to watch all night in all his armour, with his sword girded, and his lance in his hand. From this time the knight devoted himself to the redress of those wrongs which "patient merit of the unworthy takes;" to secure merchants from the rapacious cruelty of banditti, and women from ravishers, to whose power they were, by the particular confusion of the times, continually exposed.

From this view of the origin of chivalry, it will be easy to account for the castle, the moat, and the bridge, which are found in romances; and as to the dwarf, he was a constant appendage to the rank and fortune of those times, and no castle therefore could be without him. The dwarf and the buffoon were then introduced to kill time, as the card-table is at present. It will also be easy to account for the multitude of captive ladies, whom the knights, upon seizing a castle, set at liberty; and for the prodigious quantities of useless gold and silver vessels, rich stuffs, and other merchandize, with which many apartments in these castles are said to have been filled.

The principal lords who entered into the confraternity of knights, used to send their sons to each other, to be educated, far from their parents, in the mystery of chivalry. These youths, before they arrived at the age of 21, were called *bachelors*, or *bas chevaliers*, inferior knights, and at that age were qualified to receive the order.

So honourable was the origin of an institution, commonly considered as the result of caprice, and the source of extravagance; but which, on the contrary, rose naturally from the state of society in those times, and had a very serious effect in refining the manners of the European nations. Valour, humanity, courtesy,

justice, honour, were its characteristics: and to these were added religion; which, by infusing a large portion of enthusiastic zeal, carried them all to a romantic excess, wonderfully suited to the genius of the age, and productive of the greatest and most permanent effects both upon policy and manners. War was carried on with less ferocity, when humanity, no less than courage, came to be deemed the ornament of knight-hood, and knight-hood a distinction superior to royalty, and an honour which princes were proud to receive from the hands of private gentlemen: more gentle and polished manners were introduced, when courtesy was recommended as the most amiable of knightly virtues, and every knight devoted himself to the service of a lady: violence and oppression decreased, when it was accounted meritorious to check and to punish them: a scrupulous adherence to truth, with the most religious attention to fulfil every engagement, but particularly those between the sexes as more easily violated, became the distinguishing character of a gentleman, because chivalry was regarded as the school of honour, and inculcated the most delicate sensibility with respect to that point; and valour, seconded by so many motives of love, religion, and virtue, became altogether irresistible.

That the spirit of chivalry sometimes rose to an extravagant height, and had often a pernicious tendency, must however be allowed. In Spain, under the influence of a romantic gallantry, it gave birth to a series of wild adventures, which have been deservedly ridiculed: in the train of Norman ambition, it extinguished the liberties of England, and deluged Italy in blood; and at the call of superstition, and as the engine of papal power, it desolated Asia under the banner of the cross. But these ought not to be considered as arguments against an institution laudable in itself, and necessary at the time of its foundation: and those who pretend to despise it, the advocates of ancient barbarism and ancient rancour, ought to remember, that chivalry not only first taught mankind to carry the civilities of peace into the operations war, and to mingle politeness with the use of the sword; but roused the soul from its lethargy, invigorated the human character even while it softened it, and produced exploits which antiquity cannot parallel. Nor ought they to forget, that it gave variety, elegance, and pleasure, to the intercourse of life, by making woman a more essential part of society; and is therefore entitled to our gratitude, though the point of honour, and the refinements in gallantry, its more doubtful effects, should be excluded from the improvement of modern manners. For,

To illustrate this topic more particularly, we may observe, that women, among the ancient Greeks and Romans, seem to have been considered merely as objects of sensuality, or of domestic convenience: they were devoted to a state of seclusion and obscurity, had few attentions paid them, and were permitted to take as little share in the conversation, as in the general commerce of life. But the northern nations, who paid a kind of devotion to the softer sex, even in their native forests, had no sooner settled themselves in the provinces of the Roman empire, than the female character began to assume new consequence. Those fierce barbarians, who seemed to thirst only for blood, who

involved in one undistinguishing ruin the monuments of ancient grandeur and ancient ingenuity, and who devoted to the flames the knowledge of ages, always forbore to offer any violence to the women. They brought along with them the respectful gallantry of the north, which had power even to restrain their savage ferocity; and they introduced into the west of Europe, a generosity of sentiment, and a complaisance toward the ladies, to which the most polished nations of antiquity were strangers.—These sentiments of generous gallantry were fostered by the institution of chivalry, which lifted woman yet higher in the scale of life. Instead of being nobody in society, she became its *primum mobile*. Every knight devoting himself to danger, declared himself the humble servant of some lady, and that lady was often the object of his love. Her honour was supposed to be intimately connected with his, and her smile was the reward of his valour: for her he attacked, for her he defended, and for her he shed his blood. Courage, animated by so powerful a motive, lost sight of every thing but enterprise: incredible toils were cheerfully endured; incredible actions were performed; and adventures seemingly fabulous were more than realized. The effect was reciprocal. Women, proud of their influence, became worthy of the heroism which they had inspired: they were not to be approached but by the high-minded and the brave; and men then could only be admitted to the bosom of the chaste fair, after proving their fidelity and affection by years of perseverance and of peril.

Again, as to the change which took place in the operations of war, it may be observed, that the perfect hero of antiquity was superior to fear, but he made use of every artifice to annoy his enemy: impelled by animosity and hostile passion, like the savage in the American woods, he was only anxious of attaining his end, without regarding whether fraud or force were the means. But the true knight or modern hero of the middle ages, who seems in all his rencounters to have had his eye on the judicial combat, or judgment of God, had an equal contempt for stratagem and danger. He disdained to take advantage of his enemy: he desired only to see him, and to combat him upon equal terms, trusting that heaven would declare in behalf of the just; and as he professed only to vindicate the cause of religion, of injured beauty or oppressed innocence, he was further confirmed in this enthusiastic opinion by his own heated imagination. Strongly persuaded that the decision must be in his favour, he fought as if under the influence of divine inspiration, rather than of military ardour. Thus the system of chivalry, by a singular combination of manners, blended the heroic and sanctified characters, united devotion and valour, zeal and gallantry, and reconciled the love of God and of the ladies.

Chivalry flourished most during the time of the croisades. From these holy wars it followed, that new fraternities of knight-hood were invented: hence the knights of the Holy Sepulchre, the Hospitallers, Templars, and an infinite number of religious orders. Various other orders were at length instituted by sovereign princes: the Garter, by Edward III. of England; the Golden Fleece, by Philip the Good, duke of Burgundy; and St Michael, by Lewis XI. of France. From this time ancient chivalry declined to  
an

an empty name; when sovereign princes established regular companies in their armies, knights-bannets were no more, though it was still thought an honour to be dubbed by a great prince or victorious hero; and all who professed arms without knighthood, assumed the title of *esquire*.

There is scarce a prince in Europe that has not thought fit to institute an order of knighthood; and the simple title of *knight*, which the kings of Britain confer on private subjects, is a derivation from ancient chivalry, although very remote from its source. See *Knight-BACHELOR*.

*Knight-Service*, (*servitium militare*, and in law-French *chivalry*); a species of *TENURE*, the origin and nature of which are explained under the articles *CHIVALRY*, and *FEODAL SYSTEM*, n° 13,—21.

The knights produced by this tenure differed most essentially from the knights described in the preceding article; though the difference seems not to have been accurately attended to by authors (A). The one class of knights was of a high antiquity; the other was not heard of till the invention of a fee. The adorning with arms and the blow of the sword, made the act of the creation of the ancient knight; the new knight was constituted by an investment in a piece of land. The former was the member of an order of dignity which had particular privileges and distinctions; the latter was the receiver of a feudal grant. Knighthood was an honour; knight-service a tenure. The first communicated splendour to an army; the last gave it strength and numbers. The knight of honour might serve in any station whatever; the knight of tenure was in the rank of a soldier.—It is true, at the same time, that every noble and baron were knights of tenure, as they held their lands by knight-service. But the number of fees they possessed, and their creation into rank, separated them widely from the simple individuals, to whom they gave

out grants of their lands, and who were merely the knights of tenure. It is no less true, that the sovereign, without conferring nobility, might give even a single fee to a tenant; and such vassals in *capite* of the crown, as well as the vassals of single fees from a subject, were the mere knights of tenure. But the former, in respect of their holding from the crown, were to be called to take upon themselves the knighthood of honour; a condition, in which they might rise from the ranks, and be promoted to offices and command. And, as to the vassals in *capite* of the crown, who had many fees, their wealth, of itself, sufficiently distinguished them beyond the state of the mere knights of tenure. In fact, they possessed an authority over men who were of this last description; for, in proportion to their lands, were the fees they gave out, and the knights they commanded.

By the tenure of knight-service, the greatest part of the lands in England were holden, and that principally of the king in *capite*, till the middle of the last century; and which was created, as Sir Edward Coke expressly testifies, for a military purpose; viz. for defence of the realm by the king's own principal subjects, which was judged to be much better than to trust to hirelings or foreigners. The description here given is that of knight-service proper; which was to attend the king in his wars. There were also some other species of knight-service; so called, though improperly, because the service or render was of a free and honourable nature, and equally uncertain as to the time of rendering as that of knight-service proper, and because they were attended with similar fruits and consequences. Such was the tenure by *grand serjeanty*, *per magnum servitium*, whereby the tenant was bound, instead of serving the king generally in his wars, to do some special honorary service to the king in person; as to carry his banner, his sword, or the like; or be his butler, champion, or other officer, at his coronation.

Blackf.  
Comments

(A) "The terms *knight* and *chivalier*, (Dr Stuart \* observes), denoted both the knight of honour and knight of tenure; \* *Views of Society and Chivalry* was used to express both *knighthood* and *knight-service*. Hence, it has proceeded, that these persons and *city in Europe* these rates have been confounded. Yet the marks of their difference are so strong and pointed, that one must wonder *supra*, p. 346. that writers should mistake them. It is not, however, mean and common compilers only who have been deceived. Sir Edward Coke, notwithstanding his distinguishing head, is of this number. When estimating the value of the knight's fee at L. 20 *per annum*, he appeals to the *statute de militibus*, an. 1 Ed. II. and, by the force of his illustration, he conceives, that the knights alluded to there, were the same with the possessors of knight's fees: and they, no doubt, had knight's fees; but a knight's fee might be enjoyed not only by the tenants in *capite* of the crown, but by the tenants of a vassal, or by the tenants of a sub-vassal. Now, to these the statute makes no allusion. It did not mean to annex knighthood to every land-holder in the kingdom who had a knight's fee; but to encourage arms, by requiring the tenants in *capite* of the crown to take to them the dignity. He thus confounds *knighthood* and the *knight's fee*. COKE on Littleton, p. 69.

"If I am not deceived, Sir William Blackstone has fallen into the same mistake, and has added to it. Speaking of the knights of honour, or the *equites auroati* from the gilt spurs they wore, he thus expresses himself: 'They are also called, in our law, *milites*, because they formed a part, or indeed the whole, of the royal army, in virtue of their feudal tenures; one condition of which was, that every one who held a knight's fee (which in Henry II.'s time amounted to L. 20 *per annum*), was obliged to be knighted, and attend the king in his wars, or fined for his non-compliance. The exertion of this prerogative, as an expedient to raise money, in the reign of Charles I. gave great offence, though warranted by law and the recent example of queen Elizabeth: but it was, at the restoration, together with all other military branches of the feudal law, abolished; and this kind of knighthood has, since that time, fallen into great disrepute.' Book I. ch. 12.

"After what has been said, I need hardly observe, that this learned and able writer has confounded the knight of honour and the knight of tenure; and that the requisition to take knighthood was not made to every possessor of a knight's fee, but to the tenants of knight's fees held in *capite* of the crown, who had merely a sufficiency to maintain the dignity, and were thence disposed not to take it. The idea that the whole force of the royal army consisted of knights of honour, or dubbed knights, is so extraordinary a circumstance, that it might have shown, of itself, to this eminent writer, the source of his error. Had every soldier in the feudal army received the investiture of arms? could he wear a seal, surpals in silk and dress, use ensigns-armorial, and enjoy all the other privileges of knighthood? But, while I hazard these remarks, my reader will observe, that it is with the greatest deference I dissent from Sir William Blackstone, whose abilities are the object of a most general and deserved admiration." [N. B. The reader will please to advert, that this error has been copied by us from that author, under the article *Knight-BACHELOR*.]



tion. It was, in most other respects, like knight-service; only he was not bound to pay aid, or escuage; and, when tenant by knight-service paid five pounds for a relief on every knight's fee, tenant by grand-serjeanty paid one year's value of his land, were it much or little. Tenure by *cottage*, which was to wind a horn when the Scots or other enemies entered the land, in order to warn the king's subjects, was (like other services of the same nature) a species of grand-serjeanty.

These services, both of chivalry and grand-serjeanty, were all personal, and uncertain as to their quantity or duration. But, the personal attendance in knight-service growing troublesome and inconvenient in many respects, the tenants found means of compounding for it; by first sending others in their stead, and in process of time making a pecuniary satisfaction to the lords in lieu of it. This pecuniary satisfaction at last came to be levied by assessments, at so much for every knight's fee; and therefore this kind of tenure was called *scutagium* in Latin, or *servitium scuti*; *scutum* being then a well-known denomination of money: and in like manner it was called, in our Norman French, *escuage*; being indeed a pecuniary, instead of a military, service. The first time this appears to have been taken was in the 5 Hen. II. on account of his expedition to Toulouse; but it soon came to be so universal, that personal attendance fell quite into disuse. Hence we find in our ancient histories, that, from this period, when our kings went to war, they levied scutages on their tenants, that is, on all the landholders of the kingdom, to defray their expences, and to hire troops: and these assessments, in the time of Henry II. seem to have been made arbitrarily, and at the king's pleasure. Which prerogative being greatly abused by his successors, it became matter of national clamour; and king John was obliged to consent, by his *magna carta*, that no scutage should be imposed without consent of parliament. But this clause was omitted in his son Henry III.'s charter; where we only find, that scutages or escuage should be taken as they were used to be taken in the time of Henry II.; that is, in a reasonable and moderate manner. Yet afterwards, by statute 25 Edw. I. c. 5. & 6. and many subsequent statutes, it was enacted, that the king should take no aids or taxes but by the common assent of the realm. Hence it is held in our old books, that escuage or scutage could not be levied but by consent of parliament; such scutages being indeed the groundwork of all succeeding subsidies, and the land-tax of later times.

Since, therefore, escuage differed from knight-service in nothing but as a compensation differs from actual service, knight-service is frequently confounded with it. And thus Littleton must be understood, when he tells us, that tenant by homage, fealty, and escuage, was tenant by knight-service: that is, that this tenure (being subservient to the military policy of the nation) was respected as a tenure in chivalry. But as the actual service was uncertain, and depended upon emergencies, so it was necessary that this pecuniary compensation should be equally uncertain, and depend on the assessments of the legislature suited to those emergencies. For had the escuage been a settled inviolable sum, payable at certain times, it had been neither more nor less than a mere pecuniary rent; and the te-

nure, instead of knight-service, would have then been of another kind, called *socage*.

By the degenerating of knight-service, or personal military duty, into escuage, or pecuniary assessments, all the advantages (either promised or real) of the feudal constitutions were destroyed, and nothing but the hardships remained. Instead of forming a national militia composed of barons, knights, and gentlemen, bound by their interest, their honour, and their oaths, to defend their king and country, the whole of this system of tenures now tended to nothing else but a wretched means of raising money to pay an army of occasional mercenaries. In the mean time the families of all our nobility and gentry groaned under the intolerable burdens (in consequence of the fiction adopted after the conquest) were introduced and laid upon them by the subtlety and finess of the Norman lawyers. For, besides the scutages to which they were liable in defect of personal attendance, which, however, were assessed by themselves in parliament, they might be called upon by the king or lord paramount for *aids*, whenever his eldest son was to be knighted, or his eldest daughter married; not to forget the ransom of his own person. The heir, on the death of his ancestor, if of full age, was plundered of the first emoluments arising from his inheritance, by way of *relief* and *primer seisin*; and, if under age, of the whole of his estate during infancy. And then, as Sir Thomas Smith very feelingly complains, "when he came to his own, after he was out of *wardship*, his woods decayed, houses fallen down, flock wasted and gone, lands let forth and ploughed to be barren," to make amends, he was yet to pay half a year's profits as a fine for suing out his *livery*; and also the price or value of his *marriage*, if he refused such wife as his lord and guardian had bartered for, and imposed upon him; or twice that value, if he married another woman. Add to this, the untimely and expensive honour of *knighthood*, to make his poverty more completely splendid. And when, by these deductions, his fortune was so shattered and ruined, that perhaps he was obliged to sell his patrimony, he had not even that poor privilege allowed him, without paying an exorbitant fine for a *licence of alienation*.

A slavery so complicated, and so extensive as this, called aloud for a remedy in a nation that boasted of her freedom. Palliatives were from time to time applied by successive acts of parliament, which assuaged some temporary grievances. Till at length the humanity of king James I. consented, for a proper equivalent, to abolish them all; though the plan then proceeded not to effect; in like manner as he had formed a scheme, and began to put it in execution, for removing the feudal grievance of heritable jurisdictions in Scotland, which has since been pursued and effected by the statute 20 Geo. II. c. 43. King James's plan for exchanging our military tenures seems to have been nearly the same as that which has been since pursued; only with this difference, that by way of compensation for the loss which the crown and other lords would sustain, an annual fee-farm rent should be settled and inseparably annexed to the crown, and assured to the inferior lords, payable out of every knight's fee within their respective feignories. An expedient, seemingly much better than the hereditary excise which



which was afterwards made the principal equivalent for these concessions. For at length the military tenures, with all their heavy appendages, were destroyed at one blow by the statute 12 Car. II. c. 24. which enacts, "that the court of ward or liveries, and all wardships, liveries, primer seigns, and ousterleins, values and forfeitures of marriages, by reason of any tenure of the king or others, be totally taken away. And that all fines for alienations, tenures by homage, knights-service, and escuage, and also aids for marrying the daughter or knightening the son, and all tenures of the king *in capite*, be likewise taken away. And that all sorts of tenures, held of the king or others, be turned into free and common socage; save only tenures in frankalmoin, copyholds, and the honorary services (without the slavish part) of grandfeignty." A statute, which was a greater acquisition to the civil property of this kingdom than even *magna carta* itself: since that only pruned the luxuries that had grown out of the military tenures, and thereby preserved them in vigour; but the statute of king Charles extirpated the whole, and demolished both root and branches.

**KNIGHTS-ERRANT.** During the prevalence of chivalry, the ardour of redressing wrongs seized many knights so powerfully, that, attended by squires, they wandered about in search of objects whose misfortunes and misery required their assistance and succour. And, as ladies engaged more particularly their attention, the relief of unfortunate damsels was the achievement they most courted. This was the rise of knights-errant, whose adventures produced romance. These were originally told as they happened. But the love of the marvellous came to interfere; fancy was indulged in her wildest exaggerations, and poetry gave her charms to the most monstrous fictions, and to scenes the most unnatural and gigantic. See **KNIGHT**.

**KNIGHT-Bachelor.** See **BACHELOR**.

**KNIGHTS of the Shire, or KNIGHTS of Parliament;** are two gentlemen of worth, chosen on the king's writ *in pleno comitatu*, by such of the freeholders of every county as can expend 40 s. *per annu.* to represent such county in parliament.

These, when every man who held a knights-fee *in capite* of the crown was customarily constrained to be a knight, were of necessity to be *milites gladio cincti*, for so the writ runs to this day; but now custom admits squires to be chosen to this office.

They must have at least 500 l. *per annu.* and their expenses are to be defrayed by the county, tho' this be seldom, now, required.

**KNIGHT-Marshal,** an officer in the king's household, who has jurisdiction and cognizance of any transgression within the king's household and verge; as also of contracts made there, whereof one of the house is party.

**KNIGHTS,** in a ship, two short thick pieces of wood, commonly carved like a man's head, having four shivers in each, three for the baylards, and one for the top run in: one of them stands fast bolted on the beams abaft the foremast, and is therefore called the *fore-knight*; and the other, standing abaft the mainmast, is called the *main-knight*.

**KNOLLES (Richard),** was born in Northampton-

shire, about the middle of the 16th century, and educated at Oxford, after which he was appointed master of the free-school at Sandwich in Kent. He composed *Grammaticæ Latinæ, Græcæ, et Hebræicæ, compendium, cum radicibus*, London 1606; and sent a great number of well-grounded scholars to the universities. He also spent 12 years in compiling a history of the Turks; which was first printed in 1610, and by which he has perpetuated his name. In the later editions it is called, "The general history of the Turks, from the first beginning of that nation, to the rising of the Ottoman family, &c." He died in 1610, and this history has been since continued by several hands: the best continuation is that by Paul Ricaut consul at Smyrna, folio, London 1680. Knolles wrote also, "The lives and conquests of the Ottoman kings and emperors, to the year 1610; which was not printed till after his death in 1621, to which time it was continued by another hand; and lastly, "A brief discourse of the greatness of the Turkish empire, and wherein the greatness of the strength thereof consisteth, &c."

**KNOT,** a part of a tree, from which shoots out branches, roots, or even fruit. The use of the knots is, to strengthen the stem; they serve also as searces, to filtrate, purify, and refine the juices raised up for the nourishment of the plant.

**KNOTS of a Rope,** among seamen, are distinguished into three kinds, viz. whole-knot, that made so with the lays of a rope that it cannot slip, serving for sheets, tacks, and stoppers: bow-line knot, that so firmly made, and fastened to the cringles of the sails, that they must break or the sail split before it slips: and sheep-shank knot, that made by shortening a rope without cutting it, which may be presently loosened, and the rope not the worse for it.

**KNOT of the Log-line,** at sea, are the divisions of it. See the article **LOG**.

**KNOT,** in ornithology. See **TRINGA**.

**KNOT-Grass,** or bistort. See **POLYGONUM**.

**KNOT (Edward),** born in Northumberland in England, entered among the Jesuits at the age of 26, being already in priest's orders. This happened in the year 1606. He taught a long time at Rome in the English college; and was afterwards appointed sub-provincial of the college of England, and was sent provincial thither. He was twice honoured with employment. He was present as provincial at the general assembly of the order of the Jesuits held at Rome in 1646, and was chosen definitor. He died in 1696. He published several pieces; among the rest, "Mercy and Truth, or Charity maintained by the Catholics;" against Dr Potter, who had charged the church of Rome with wanting charity, because she asserts that a man cannot be saved in the protestant communion.

**KNOWLEDGE,** is defined by Mr Locke to be the perception of the connection and agreement or disagreement and repugnancy of our ideas. See **METAPHYSICS**, n° 163—231; and **LOGIC**, n° 27—29. 53.

**KNOX (John),** the hero of the reformation in Scotland, was born in 1505, at Gifford near Haddington in East Lothian; and educated at the university of St Andrew's, where he took a degree in arts, and commenced teacher very early in life. At this time the new religion of Martin Luther was but little known.

Knox.

known in Scotland; Mr Knox therefore at first was a zealous Roman-catholic: but, attending the sermons of a certain black-friar, named *Guilliam*, he began to waver in his opinions; and afterwards conversing with the famous Wilhart, who, in 1544, came to Scotland with the commissioners sent by Henry VIII. he renounced the Romish religion, and became a zealous reformer. Being appointed tutor to the sons of the lairds of Ormiston and Langniddery, he began to instruct them in the principles of the Protestant religion; and, on that account, was so violently persecuted by the bishop of St Andrew's, that, with his two pupils, he was obliged, in the year 1547, to take shelter in the castle of that place. But the castle was besieged and taken by 21 French galleys. He continued a prisoner on board a galley two years, namely, till the latter end of the year 1549; when being set at liberty, he landed in England, and, having obtained a licence, was appointed preacher, first at Berwick, and afterwards at Newcastle. Strype conjectures, that in 1552 he was appointed chaplain to Edward VI. He certainly obtained an annual pension of 40*l.* and was offered the living of All-hallows in London; which he refused, not choosing to conform to the liturgy.

Soon after the accession of queen Mary, he retired to Geneva; whence, at the command of John Calvin, he removed to Francfort, where he preached to the exiles: but, a difference arising on account of his refusing to read the English liturgy, he went back to Geneva; and from thence, in 1555, returned to Scotland, where the reformation had made considerable progress during his absence. He now travelled from place to place, preaching and exhorting the people with unremitting zeal and resolution. About this time, (1556), he wrote a letter to the queen regent, earnestly intreating her to hear the Protestant doctrine; which letter he treated with contempt. In the same year the English Calvinists at Geneva invited Mr Knox to reside among them. He accepted their invitation. Immediately after his departure from Scotland, the bishops summoned him to appear, and, he not appearing, condemned him to death for heresy, and burnt his effigy at the cross of Edinburgh.

Our reformer continued abroad till the year 1559, during which time he published his "First blast against the monstrous regiment of women." Being now returned to Scotland, he resumed the great work of reformation with his usual ardour, and was appointed minister at Edinburgh. In 1561, queen Mary arrived from France. She, it is well known, was bigotted to the religion in which she had been educated, and, on that account, was exposed to continual insults from her reformed subjects. Mr Knox himself frequently insulted her from the pulpit; and, when admitted to her presence, regardless of her sex, her beauty, and her high rank, behaved to her with a most unjustifiable freedom. In the year 1571 our reformer was obliged to leave Edinburgh, on account of the confusion and danger from the opposition to the earl of Lenox, then regent; but he returned the following year, and resumed his pastoral functions. He died at Edinburgh in November 1572, and was buried in the church-yard of St Giles's in that city.—His history of the Reformation was printed, with his

other works, at Edinburgh, in 1584, 1586, 1644, 1732. He published many other pieces; and several more are preserved in Calderwood's history of the Church of Scotland. He left also a considerable number of manuscripts, which in 1732 were in the possession of Mr Woodrow, minister of Eastwood.

As to his character, it is easily understood, notwithstanding the extreme diffidence of the two portraits drawn by Popish and Calvinistical pencil. According to the first, he was a devil; in the ideas of the latter, an angel. He was certainly neither. The following character is drawn by Dr Robertson. "Zeal, intrepidity, disinterestedness, were virtues that he possessed in an eminent degree. He was acquainted too with the learning cultivated in that age; and excelled in that species of eloquence which is calculated to rouse and to inflame. His maxims, however, were often too severe, and the impetuosity of his temper excessive. Rigid and uncompromising, he shewed no indulgence to the infirmities of others. Regardless of the distinctions of rank and character, he uttered his admonitions with an acrimony and vehemence, more apt to irritate than to reclaim; and this often betrayed him into indecent expressions, with respect to queen Mary's person and conduct. Those very qualities, however, which now render his character less amiable, fitted him to be the instrument of Providence for advancing the reformation among a fierce people, and enabled him to face dangers, and to surmount opposition, from which a person of a more gentle spirit, would have been apt to shrink back. By an unwearied application to study and to business, as well as by the frequency and fervour of his public discourses, he had worn out a constitution naturally strong. During a lingering illness, he discovered the utmost fortitude; and met the approach of death with a magnanimity inseparable from his character. He was constantly employed in acts of devotion, and comforted himself with those prospects of immortality, which not only preserve good men from desponding, but fill them with exultation in their last moments. The earl of Morton, who was present at his funeral, pronounced his eulogium in a few words, the more honourable for Knox, as they came from one whom he had often censured with peculiar severity: "Here lies he who never feared the face of man."

KNUTZEN (Matthias), a native of Holstein, the only person on record who openly professed and taught atheism. It is said he had about 1000 disciples in different parts of Germany. They were called *Conscienciaries*, because they asserted there is no other God, no other religion, no other lawful magistracy, but conscience, which teaches every man the three fundamental principles of the law of nature;—To hurt nobody, to live honestly, and to give every one his due. Several copies of a letter of his from Rome were spread abroad, containing the substance of his system. It is to be found entire in the last edition of Micraelius.

KOEMPFER (Engelbert), was born in 1651 at Lengow in Westphalia. After studying in several towns, he went to Dantzick, where he gave the first public specimen of his proficiency by a dissertation *De majestatis divisione*. He then went to Thorn; and from thence to the university of Cracow, where he took  
his

Knox  
Knoempfer

Koenig,  
König.

his degree of doctor in philosophy; after which he went to Königsberg in Prussia, and staid there four years. He next travelled into Sweden, where he soon began to make a figure, and was appointed secretary of the embassy to the sophi of Persia. He set out from Stockholm with the presents for that emperor; and went through Asaland, Finland, and Ingermanland, to Narva, where he met Mr Fabricius the ambassador, who had been ordered to take Moscow in his way. The ambassador having ended his negotiations at the Russian court, set out for Persia. During their stay, two years, at Ispahan, Dr Kœmpfer, whose curious and inquisitive disposition suffered nothing to escape him unobserved, made all the advantages possible of so long an abode in the capital of the Persian empire. The ambassador, toward the close of 1685, preparing to return into Europe, Dr Kœmpfer chose rather to enter into the service of the Dutch East-India company, in quality of chief surgeon to the fleet, then cruising in the Persian gulph. He went aboard the fleet, which, after touching at many Dutch settlements, came to Batavia in September 1689. Dr Kœmpfer here applied himself chiefly to natural history. Hence he set out for Japan, in quality of physician to the embassy which the Dutch East-India company sends once a-year to the Japonese court. He quitted Japan to return to Europe in 1692. In 1694 he took his degree of doctor of physic at Leyden; on which occasion he communicated, in what are called *inaugural theses*, ten very singular and curious observations made by him in foreign countries. He intended to digest his memoirs into proper order; but was prevented, by being made physician to the count de Lippe. He died in 1716. His principal works are, 1. *Amenitates Exotice*, in quarto; a work which includes many curious and useful particulars in relation to the civil and natural history of the countries through which he passed. 2. *Herbarium Ultra-Gangeticum*. 3. The history of Japan in German, which is very curious and much esteemed, and for which the public is indebted to the late Sir Hans Sloane, who purchased, for a considerable sum of money, all our author's curiosities, both natural and artificial, as likewise all his drawings and manuscript memoirs, and prevailed with the late learned Dr Scheuchzer to translate the Japanese history into English.

KOENIG (Samuel), a learned philosopher and mathematician, was professor of philosophy at Francrker, and afterwards at the Hague, where he became librarian to the Stadtholder, and died there in 1757. He wrote several works which are esteemed.

KONIG (George Matthias), a learned German, born at Altorf in Franconia, in 1616. He became professor of poetry and of the Greek tongue there, and librarian to the university; in which last office he succeeded his father. He gave several public specimens of his learning; but is principally known for a biographical dictionary, intitled, *Bibliotheca vetus et nova*, 4to. Altorf, 1674: which, though it is very defective, is useful to biographers. He died in 1699.

KONIG (Emanuel), a learned physician of Basil, born in that city in 1658, whose medicinal works were so esteemed in Switzerland, that he was considered as a second Avicenna. He died at Basil in 1731.

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KONINGSBERG, a town of Poland, and capital of Regal Prussia, with an university, and a magnificent palace, in which is a hall 274 feet long and 59 broad, without pillars to support it, and a handsome library. It contains 3800 houses, and 40,000 inhabitants; and the present king of Prussia received homage of the inhabitants in 1740. The town-house, the exchange, and the cathedral church, are all very fine structures. The tower of the castle is exceeding high; and has 284 steps to go to the top, from whence there is a very distant prospect. There are 18 churches in all; of which 14 belong to the Lutherans, 3 to the Calvinists, and one to the Papists. It is seated on the river Preget, near the sea, E. Long. 21. 35. N. Lat. 54. 42.

KORAN, or ALCORAN. See ALCORAN and MAHOMETANISM.

KOOS. See DOLICHOS.

KOS, in Jewish antiquity, a measure of capacity, containing about four cubic inches: this was the cup of blessing out of which they drank when they gave thanks after solemn meals, like that of the passover.

KOTTERUS (Christopher), was one of the three fanatics whose visions were published at Amsterdam in 1657, with the title of *Lux in tenebris*. He lived at Sprotta in Silesia, and his visions began in 1616. He fancied he saw an angel under the form of a man, who commanded him to go and declare to the magistrates, that, unless the people repented, the wrath of God would make dreadful havoc. The elector palatine, whom the Protestants had declared king of Bohemia, was introduced in these visions. Kotterus waited on him at Breslaw in December 1620, and informed him of his commission. He went to several other places, and at last to the court of Brandenburg. As most of these predictions promised felicity to the elector Palatine, and unhappiness to his imperial Majesty, the emperor's fiscal in Silesia and Lusatia got him seized, set on the pillory, and banished the emperor's dominions. Upon this he went to Lusatia, and there lived unmolested till his death, which happened in 1647.

KOUANIN, in the Chinese language, the name of a tutelary deity of women. The Chinese make great numbers of the figures of this deity in white porcelain, and send them to all parts of the world, as well as keep them in their own houses. The figure represents a woman with a child in her arms. The women who have no children pay a sort of adoration to these images, and suppose the deity they represent to have power to make them fruitful. The statue always represents a handsome woman very modestly attired.

KOUÉ (Peter), an excellent painter in the 16th century, was born at Aloft, and was the disciple of Bernard Van Orley, who lived with Raphael. He went to Rome, and, by studying the beautiful pieces which he found there, formed an excellent taste, and became a very correct designer. On his return to his own country, he undertook the office of directing the execution of some tapestry-work after the designs of Raphael. He was afterwards persuaded by some merchants of Brussels to undertake a voyage to Constantinople; but when he came there, finding that the Turks were not allowed by their religion to draw any figure, and that there was nothing for him to do but

Königs-  
berg  
Koue.



Kouli Khan, to draw designs for tapestry, he spent his time in designing the particular prospects in the neighbourhood of Constantinople, and the manner of the Turks living; of which he has left many wooden cuts, that alone suffice to give an idea of his merit. After his return from Constantinople he settled at Antwerp, where he drew several pictures for the emperor Cha. V. He was also a good architect; and, in the latter part of his life, wrote a treatise of sculpture, geometry, and perspective; and translated Viruvius and Serliv into the Flemish tongue. He died in 1550.

KOULI KHAN (Thamas), or *Schah Nadir*, was not the son of a shepherd, as the authors of the English biographical dictionary assert; his father being chief of a branch of the tribe of Afchairs, and governor of a fortress erected by that people against the Turks. Upon his father's death, his uncle usurped his government, under the pretext of taking care of it during the minority of Kouli Khan; or, more properly, young Nadir. Disgust at this affront made him commence adventurer. He entered into the service of Beglerberg, governor of Muschada, in the Khorasan; who, discovering in him strong marks of a military genius, promoted him to the command of a regiment of cavalry. In 1720, the Uzbek Tartars having made an eruption into the Khorasan with 10,000 men, Beglerberg, whose whole force consisted only of 4000 horse and 2000 infantry, called a council of war, in which it was declared imprudent to face the enemy with such an inferior force; but Kouli-Khan proposed to march against the enemy, and engaged to conduct the expedition, and to be answerable for the success of it. He was accordingly made general; defeated the Tartars, and took their commander prisoner. Hossen Beglerberg received him at his return with marks of distinction: but growing jealous of his rising fame, instead of obtaining him the rank of lieutenant-general of the Khorasan, as he had promised, obtained it for another; which so exasperated Kouli-Khan, that he publicly complained of the governor's ingratitude and perfidy; who thereupon broke him, and ordered him to be punished with the bastinado so severely, that the nails of his great toes fell off. This affront occasioned his flight, and his joining a banditti of robbers, (not his stealing his father's or his neighbour's sheep). The rest of his adventures are too numerous to be inserted in this work. In 1729, he was made general of Persia by Schah Thamas, and permitted to take his name *Thamas*, and that of *Khuli*, which signifies *slave*: his title therefore was, *The slave of Thamas*; but he was ennobled by the addition of Khan. In 1739, he fomented a revolt against his master, for having made an inglorious peace with the Turks; and having the army at his command, he procured his deposition, and his own advancement to the throne. In 1739 he conquered the Mogul empire; and from this time growing as cruel as he was ambitious, he at length met with the usual fate of tyrants, being assassinated by one of his generals, in league with his nephew and successor, in 1747, aged sixty.

KRAKEN, KRAZEN, or *Krabben*, a name given by the Norwegians to a sea-monster of a most enormous size, the existence of which seems to be after all rather dubious. Erich Pontoppidan, bishop of Bergen,

in his Natural History of Norway, gives the most distinct account of this creature; which, according to him, is of the polypus kind. He is of opinion, that it is mentioned by Pliny and some other ancient authors, and will have it to be the remora so much spoken of by the ancient writers. This last, however, is now pretty certainly known to be a mistake; for the remora has been observed in the Mediterranean, and found to be a creature vastly inferior in size to the Kraken. See REMORA. The bishop's evidences for the existence of the Kraken, and his conjectures about it, we shall give in his own words.

"Our fishermen," says he, "unanimously affirm, and without the least variation in their accounts, that when they row out several miles to sea, particularly in the hot summer-days, and by their situation (which they know by taking a view of certain points of land) expect to find 80 or 100 fathoms water, it often happens that they do not find above 20 or 30, and sometimes less. At these places they generally find the greatest plenty of fish, especially cod and ling. Their lines, they say, are no sooner out, than they may draw them up with the hooks all full of fish; by this they judge that the kraken is at the bottom. They say this creature causes those unnatural shallows mentioned above, and prevents their founding. These the fishermen are always glad to find, looking upon them as a means of their taking abundance of fish. There are sometimes twenty boats or more got together, and throwing out their lines at a moderate distance from each other; and the only thing they then have to observe is, whether the depth continues the same, which they know by their lines, or whether it grows shallower, by their seeming to have less water. If this last be the case, they find that the kraken is raising himself nearer the surface, and then it is not time for them to stay any longer; they immediately leave off fishing, take to their oars, and get away as fast as they can. When they have reached the usual depth of the place, and find themselves out of danger, they lie upon their oars, and in a few minutes after they see this enormous monster come up to the surface of the water; he there shows himself sufficiently, though his whole body does not appear, which, in all likelihood, no human eye ever beheld, (excepting the young of this species, which shall afterwards be spoken of); its back, or upper part, which seems to be in appearance about an English mile and an half in circumference, (some say more, but I choose the least for greater certainty), looks at first like a number of small islands, surrounded with something that floats and fluctuates like sea-weeds. Here and there a larger rising is observed like sand-banks, on which various kinds of small fishes are seen continually leaping about till they roll off into the water from the sides of it; at last several bright points or horns appear, which grow thicker and thicker the higher they rise above the surface of the water, and sometimes they stand up as high and as large as the masts of middle-sized vessels.

"It seems these are the creature's arms; and, it is said, if they were to lay hold of the largest man of war, they would pull it down to the bottom. After this monster has been on the surface of the water a short time, it begins slowly to sink again, and then the

Kraken.



Kraken. the danger is as great as before; because the motion of his sinking cauls such a swell in the sea, and such an eddy or whirlpool, that it draws every thing down with it.

"As this enormous sea-animal, in all probability, may be reckoned of the polype or the star-fish kind, it seems, that the parts which are seen rising at its pleasure, and are called *arms*, are properly the tentacula, or feeling instruments, called *horns* as well as *arms*. With these they move themselves, and likewise gather in their food.

"Besides these, for this last purpose the great Creator has also given this creature a strong and peculiar scent, which it can emit at certain times, and by means of which it beguiles and draws other fish to come in heaps about it. This animal has another strange property, known by the experience of a great many old fishermen. They observe, that for some months the kraken, or krabben, is continually eating, and in other months he always voids his excrements. During this evacuation, the surface of the water is coloured with the excrement, and appears quite thick and turbid. This muddiness is said to be so very agreeable to the smell or taste of other fishes, or to both, that they gather together from all parts to it, and keep for that purpose directly over the kraken: he then opens his arms or horns, seizes and swallows his welcome guests, and converts them, after the due time, by digestion, into a bait for other fish of the same kind. I relate what is affirmed by many; but I cannot give so certain assurances of this particular, as I can of the existence of this surprising creature; though I do not find any thing in it absolutely contrary to nature. As we can hardly expect an opportunity to examine this enormous sea-animal alive, I am the more concerned that nobody embraced that opportunity which, according to the following account, once did, and perhaps never more may offer, of seeing it entire when dead. The reverend Mr Friis, consistorial assessor, minister of Bodoen in Nordland, and vicar of the college for promoting Christian knowledge, gave me, at the latter end of last year, when he was at Bergen, this relation; which I deliver again on his credit.

"In the year 1680, a krake, (perhaps a young and careles one), came into the water that runs between the rocks and cliffs in the parish of Alstahoug; tho' the general custom of that creature is to keep always several leagues from land, and therefore of course they must die there. It happened that its extended long arms, or antennæ, which this creature seems to use like the snail, in turning about, caught hold of some trees standing near the water, which might easily have been torn up by the roots; but besides this, as it was found afterwards, he entangled himself in some openings or clefts in the rock, and therein stuck so fast, and hung so unfortunately, that he could not work himself out, but perished and putrified on the spot. The carcase, which was a long while decaying, and filled great part of that narrow channel, made it almost impassable by its intolerable stench.

"The kraken has never been known to do any great harm, except they have taken away the lives of those who consequently could not bring the tidings. I have never heard but one instance mentioned, which hap-

pened a few years ago near Fridrichstad, in the diocese of Aggerhuys. They say that two fishermen accidentally, and to their great surprise, fell into such a spot on the water as has been before described, full of a thick slime, almost like a morass. They immediately strove to get out of this place: but they had not time to turn quick enough to save themselves from one of the kraken's horns; which crushed the head of the boat so, that it was with great difficulty they saved their lives on the wreck, though the weather was as calm as possible; for these monsters never appear at other times.

"Mr Luke Debes, in his description of Faroe, speaks of certain islands which suddenly appear, and as suddenly vanish. This was a thing nobody could comprehend; so that one ought not to wonder at the common people, and even those that were a degree above them, for looking upon those moving islands to be inhabited by evil spirits, which appeared sometimes in such places where the seamen, by daily experience, knew very well that there was no such thing as a rock, much less an island; but, however, they often found something at sea which had the appearance of land, and consequently were confounded, made false reckonings, and were taken out of their course, and brought into the greatest inconveniences. Many sea-faring people give accounts of such appearances of land, and their suddenly vanishing away, and particularly here in the north sea. These islands, in the boisterous ocean, cannot be imagined to be of the nature of those real floating islands that are seen on fresh and stagnated waters, and which I have observed are found here in Norway and in other places. These could not possibly hold or stand against the violence of the waves in the ocean, which break the largest vessels; and therefore our sailors have concluded this delusion could come from no other than that great deceiver the devil. But, according to the laws of truth, we ought not to charge this apostate spirit without a cause. I rather think that this devil, who so suddenly makes and unmakes these floating islands, is nothing else but the kraken, which some sea-faring people call *Sce-draulen*, that is, *Sce-trolden*, "sea-mischief."

KRANTZIUS (Albertus), a native of Hamburg, and a famous historian, who travelled over several parts of Europe, and was made rector of the university of Rostoch in 1482. He went from thence to Hamburg in 1508, where he was elected dean of the chapter in the cathedral. He did many good services to that church and city; and was so famed for his abilities and prudence, that John king of Denmark, and Frederic duke of Holstein, did not scruple to make him umpire in a dispute they had with the Dittmarsh. He wrote several good historical works; the most considerable of which is an Ecclesiastical History of Saxony, entitled *Metropolis*, in folio; the best edition is that of Francfort. He died in 1517.

KUHLMAN (Quirinus), one of the visionaries of the 17th century, born at Breslaw in Silesia in 1651. He gave great hopes by his early progress in his studies; but it was interrupted by a sickness, under which he laboured at 18 years of age. He was thought to be dead on the third day of his illness. But that day he had terrible visions. Two days after, he died.

more. He had no longer any taste for profane learning; and would have no instructor but the Holy Ghost. At 19 he left his country and went to travel. He met in Holland with Böhmen's works, of which he had never heard before. The reading of them was like oil thrown into the fire: he was surprised that Böhmen should have prophesied of things, of which nobody but Kuhlman himself had the least knowledge. There was at that time in Holland one John Rothe, who undertook to prophecy. Our author wrote to him in the most humble manner, styling him *a man of God, John III. and the son of Zacharias*. He wandered a long time in England, France, and the East; and at last was burnt in Moscow 1680, on account of some predictions that were actually seditious. There was a picture of him with so many titles, that the monarchs of the East never assumed more. The magnificent promises and vast designs of this fanatic may be seen in Morhof's *Polybistor*. He wrote several works filled with fanaticism; the principal of which is intitled *Prodromus quinquennii mirabilis*, printed at Leyden in 1674.

KUHNUS (Jöschim), a learned German critic, was born at Griplwalde in Pomerania, in 1647. He was, in 1669, made principal of the college at Oettingen in Swabia; in 1676, he was elected Greek professor in the principal college at Strasburg; and after acquitting himself with honour for ten years in this capacity, was made Greek and Hebrew professor in the same university. His uncommon skill in the Greek language drew a great number of scholars about him, from very distant places; and he published some classic authors with very learned notes both explanatory and critical. He died in 1697.

KUNCKEL (John), a celebrated Saxon chemist, born in the duchy of Sleswick, in 1630. He became chemist to the elector of Saxony, the elector of Brandenburg, and Charles II. king of Sweden, who gave him the title of *counsellor in metals*, and letters of nobility, with the surname of *Louwenstein*. He employed 50 years in chemistry; in which, by the help of the furnace of a glass-house, which he had under his care, he made several excellent discoveries, particularly of the phosphorus of urine. He died in Swe-

den, in 1702; and left several works, some in German, and others in Latin: among which, that intitled *Observationes Chemicæ*, and the "Art of making Glass," printed at Paris in 1752, are the most esteemed.

KUSTER (Ludolf), a very learned writer in the 18th century, was born at Blomberg in Westphalia. When very young, he was, upon the recommendation of baron Spanheim, appointed tutor to the two sons of the count de Schwerin, prime minister of the king of Prussia, who, upon our author's quitting that station, procured him a pension of 400 livres. He was promised a professorship in the university of Joachim; and till this should be vacant, being then but 25, he resolved to travel. He read lectures at Utrecht; went to England; and from thence to France, where he collated Suidas with three MSS. in the king's library, which furnished him with a great many fragments that had never been published. He was honoured with the degree of doctor by the university of Cambridge, which made him several advantageous offers to continue there: but he was called to Berlin, where he was intalled in the professorship promised him. Afterward he went to Antwerp; and being brought over to the Catholic religion, he abjured that of the Protestants. The king of France rewarded him with a pension, and ordered him to be admitted supernumerary associate of the academy of inscriptions. But he did not enjoy this new settlement long; for he died in 1716, aged 46. He was a great master of the Latin tongue, and wrote well in it; but his chief excellence was his skill in the Greek language, to which he almost entirely devoted himself. He wrote many works; the principal of which are, *Historia critica Homeri*. 2. *Jamblicus de vita Pythagoræ*. 3. An excellent edition of Suidas, in Greek and Latin, three volumes, folio. 4. An edition of Aristophanes, in Greek and Latin, folio. 5. A new Greek edition of the New Testament, with Dr Mills's Variations, in folio.

KUTUCHTU, among the Calmuc Tartars, the name of their high-priest or sovereign pontiff; formerly only the deputy of the delai-lama or high-priest of the Tartars, but at present independent on him.

## L.

**L**, A semi-vowel, or liquid, making the eleventh letter of the alphabet.

It was derived from the old Hebrew Lamed, or Greek Lambda. It is founded by intercepting the breath between the top of the tongue and forepart of the palate, with the mouth open; and makes a sweet sound, with something of an aspiration; and therefore the Britons and Spaniards usually doubled it, or added an *h* to it, in the beginning of words, as in *llan*, or *lean*, a temple, founding nearly like *ß*, &c. In English words of one syllable it is doubled at the end, as

*tell, bell, knell*, &c. but in words of more syllables than one it is single at the end, as *evil, general, constitutional*, &c. It is placed after most of the consonants in the beginning of words and syllables, as *black, glare, ad-le, ea-gle*, &c. but before none. Its sound is clear in *Abel*, but obscure in *able*, &c.

As a numeral letter, *L* denotes 50; and with a dash over it, thus, *L̄*, 50000. Used as an abbreviation, *L* stands for Lucius; and *L. L. S.* for a fellecer. See *SESTERCE*.

*LA*, the syllable by which Guido denotes the last sound

Labadie. found of each hexachord: if it begins in C, it answers to our A; if in G, to E; and if in F, to D.

LABADIE (John), a famous French enthusiast, son of John Charles Labadie, governor of Bourges, and gentleman in ordinary of the bed-chamber to the French king, was born in 1610. He entered young into the Jesuits college at Bourdeaux; which, by his own account, he afterwards quitted, but by other accounts was expelled for his peculiar notions, and for hypocrisy. He became a popular preacher; but being repeatedly detected in working upon female devotees with spiritual instructions for carnal purposes, his loss of character among the Catholics drove him among the Protestants. A reformed Jesuit being thought a great acquisition, he was precipitately accepted as a pastor at Montauban, where he officiated for eight years; but, attempting the chastity of a young lady whom he could not convert to his purpose, and quarrelling with the Catholic priest about the right of interring a dead body, he was at length banished that place. The story of his affair with the lady, as related by Mr Bayle, may here be given as a specimen of his ministry. Having directed this damsel to the spiritual life, which he made to consist in internal recollection and mental prayer, he gave her out a certain point of meditation; and having strongly recommended it to her to apply herself entirely for some hours to such an important object, he went up to her when he believed her to be at the height of her recollection, and put his hand into her breast. She gave him a hasty repulse, expressed a great deal of surprize at the proceeding, and was even preparing to rebuke him, when he, without being in the least disconcerted, and with a devout air, prevented her thus: "I see plainly, my child, that you are at a great distance from perfection; acknowledge your weakness with an humble spirit; ask forgiveness of God for your having given so little attention to the mysteries upon which you ought to have meditated. Had you bestowed all necessary attention upon these things, you would not have been sensible of what was doing about your breast. But you are so much attached to sense, so little concentered with the Godhead, that you were not a moment in discovering that I had touched you. I wanted to try whether your fervency in prayer had raised you above the material world, and united you with the Sovereign Being, the living source of immortality and of a spiritual state; and I see to my great grief, that you have made very small progress, and that you only creep on the ground: may this, my child, make you ashamed, and for the future move you to perform the duties of mental prayer better than you have hitherto done." The young lady, who had as much good-sense as virtue, was no less provoked at these words, than at the bold actions of her ghostly instructor; and could never afterwards bear the name of such an holy father.

Labadie being driven out of Montauban, went to seek an asylum at Orange: but not finding himself so safe there as he imagined, he withdrew privately to Geneva, where he imposed on the people by his devout preaching and carriage; and from thence was invited to Middleburg, where his spirituality made him and his followers considered as so many saints, distinguished by the name of *Labadists*. They in-

creased so much, that he excited the attention of the other churches, whose authority he disputed, till he was formally deposed by the synod of Dort. Instead of obeying, he procured a tumultuous support from a crowd of his devotees; and at length formed a little settlement between Utrecht and Amsterdam, where he erected a printing-press, which sent forth many of his works. Here he was betrayed by some deserters, who exposed his private life, and informed the public of his familiarities with his female disciples, under pretence of uniting them more particularly to God; and was finally obliged to retire to Altena in Holstein, where he died in 1674.

LABADISTS, a sect of religionists in the 17th century, followers of the opinions of John Labadie, of whom an account is given in the preceding article. Some of their opinions were, 1. That God could, and did deceive men. 2. That, in reading the Scriptures, greater attention should be paid to the internal inspiration of the Holy Spirit, than to the words of the text. 3. That baptism ought to be deferred till mature age. 4. That the good and the wicked entered equally into the old alliance, provided they descended from Abraham; but that the new admitted only spiritual men. 5. That the observation of Sunday was a matter of indifference. 6. That Christ would come and reign 1000 years on earth. 7. That the eucharist was only a commemoration of the death of Christ; and that, though the symbols were nothing in themselves, yet that Christ was spiritually received by those who partook of them in a due manner. 8. That a contemplative life was a state of grace, and of divine union during this life, the summit of perfection, &c. 9. That the man whose heart was perfectly content and calm, half enjoys God, has familiar entertainments with him, and sees all things in him. 10. That this state was to be come at by an entire self-abnegation, by the mortification of the senses and their objects, and by the exercise of mental prayer.

LABARUM, the banner or standard borne before the Roman emperors in the wars. The *labarum* consisted of a long lance, with a staff a-top, crossing it at right angles; from which hung a rich streamer, of a purple colour, adorned with precious stones. Till the time of Constantine it had an eagle painted on it; but that emperor, in lieu thereof, added a cross with a cipher expressing the name of *Jesus*.

This standard the Romans took from the Germans, Dace, Sarmate, Pannonians, &c. whom they had overcome. The name *labarum* was not known before the time of Constantine; but the standard itself, in the form we have described it, abating the symbols of Christianity, was used by all the preceding emperors. Some derive the word from *labor*, as if this finished their labours; some from *εὐλαστία*, "reverence, piety;" others from *λαμβάνειν*, "to take;" and others from *λαρυσ*, "spoils."

LABAT (John Baptiste), a celebrated traveller, of the order of St Dominic, was born at Paris, taught philosophy at Nancy, and in 1693 went to America in quality of a missionary. At his return to France in 1705, he was sent to the chapter of his order at Bologna to give an account of his mission, and staid several years in Italy. He died at Paris in 1738. His principal works are, 1. A new voyage to the American

Labadists

Labat.



American islands, 6 vols 12mo. 2. Travels in Spain and Italy, 8 vols 12mo. 3. A new account of the western parts of Africa, 5 vols 12mo.: Father Labat was not in Africa, and therefore was not a witness of what he relates in that work. He also published the *Chevalier des Marchais's voyage to Guinea*, in 4 vols 12mo.; and *An historical account of the western parts of Ethiopia*, translated from the Italian of father Cavazzi, 5 vols 12mo.

**LABBE** (Louisa), a courtesan and poetess of Lyons. Her charms were so great, that her contemporaries have lavished every kind of applause on her. She entertained at her house lords, gentlemen, and other persons of merit, with conversation, music, and the reading of good authors, with which her closet was abundantly stocked, and with the most delicious sweet-meats. She was particularly fond of learned men; who were so much in her good graces, that she preferred them before any nobleman of the highest distinction. All the compositions she left are comprized in a book, which is extremely scarce, intitled, *Ouvres de Louise Labbé, Lionnoise*, printed at Lyons in 1556; in which is, *The contest of Love and Folly*.

**LABBE** (Philip), born at Bourges in France, in 1607; professed philosophy, divinity, and the languages, with great applause; and died in 1667, aged 70. He was a laborious writer, and a good critic; and wrote, 1. *Nova Bibliotheca MS. librorum*, in 2 vols folio. 2. *De Byzantine historie Scripturibus*. 3. *Galenii vita*. 4. *Bibliotheca bibliothecarum*. 5. *Concordantia chronologica*, &c. He began the last edition of "The councils," and died while the 9th volume was printing; they were finished in 17 volumes, by father Cossart.

**LABDANUM**, or **LADANUM**, a resin of the softer kind, though of too firm a consistence to be ranked among the fluid ones.

There are two kinds of it kept in the shops; one usually imported in bladders, to preserve it in its genuine soft consistence, and to prevent the evaporation of its finer parts; another in rolls, much inferior to the former in purity and virtue.

*Labdanum* should be chosen soft and moist, of a strong smell, pure, very inflammable, and diffusing a fragrant smell while burning. It is a resinous juice, which exudes from a tree of the cistus-kind. See **CISTUS**.

In medicine it is used externally, to attenuate and disolve tumours; internally, it is more rarely used, but it is greatly extolled by some against catarrhs, and in dysenteries.

**LABEL**, a long, thin brass ruler, with a small sight at one end, and a centre-hole at the other; commonly used with a tangent-line on the edge of a circumferenter, to take altitudes, &c.

**LABEL**, in law, is a narrow slip of paper, or parchment, affixed to a deed or writing, in order to hold the appending seal.—Any paper annexed by way of addition, or explication, to any will or testament, is also called a *label* or *codicil*.

**LABEL**, in heraldry, a fillet usually placed in the middle along the chief of the coat, without touching its extremities. Its breadth ought to be a ninth part of the chief. It is adorned with pendants; and when

there are above three of these, the number must be specified in blazoning.

It is used on the arms of eldest sons while the father is alive, to distinguish them from the younger; and is esteemed the most honourable of all differences. See **HERALDRY**, p. 3587. col. 2.

**LABIAL** LETTERS, those pronounced chiefly by means of the lips.

**LABIATED** FLOWERS, monopetalous flowers, consisting of a narrow tube, with a wide mouth, divided into two or more.

**LABIAU**, a small town of Ducal Prussia, in a circle of the same name, seated at the mouth of the river Deime, with a strong castle, two sides of which are surrounded with water, and the other defended by a wall and ditch. E. Long. 19. 56. N. Lat. 55. 17.

**LABORATORY**, or **ELABORATORY**, the chemists work-house, or the place where they perform their operations, where the furnaces are built, their vessels kept, &c. and in general, the term *laboratory*, is applied to any place where physical experiments in pharmacy, chemistry, pyrotechny, &c. are performed.

As laboratories must be of very different kinds, according to the nature of the operations to be performed in them, it is impossible that any directions can be given which will answer for every one. Where the purposes are merely experimental, a single furnace or two of the portable kind will be sufficient. It is scarce needful to add, that selves are necessary for holding vessels with the products of the different operations; and that it is absolutely necessary to avoid confusion and disorder, as by these means the products of the operations might be lost or mistaken for one another. Mortars, filters, levigating stones, &c. must also be procured: but from a knowledge of the methods of performing the different chemical operations will easily be derived the knowledge of a proper place to perform them in; for which, see the articles **CHEMISTRY**, **METALLURGY**, and **FURNACE**.

**LABORATORY**, in military affairs, signifies that place where all sorts of fire-works are prepared, both for actual service and for pleasure, viz. quick-matches, fuzes, portfires, grape-shot, case-shot, carcasses, hand-grenades, cartridges, shells filled and fuses fixed, wads, &c. &c.

**LABOUR**, in general, denotes a close application to work or business.—Among seamen a ship is said to be in labour, when the rolls and tumbles very much, either a-hull, under sail, or at anchor.—It is also spoke of a woman in travail or child-birth; see **MIDWIFERY**.

**LABOURER**, generally signifies one that does the most slavish and less artful part of a laborious work, as that of husbandry, masonry, &c.

**LABOUREUR** (John le), almoner to the king of France, and prior of Juvigne, was born at Montmorency near Paris in 1623. At the age of 18, he distinguished himself by publishing "A collection of the monuments of illustrious persons buried in the church of the Celestines at Paris, with their eulogies, genealogies, arms, and mottoes," &c. He afterwards published an excellent edition of *The Memoirs of Michael de Castelnau*, with several other genealogical histories; and died in 1675.—He had a brother, *Lewis le Laboureur*, bailiff of Montmorency, author of several pieces



Labrador of poetry; and an uncle, *Dom. Claude le Laboureur*, provost of the abbey of L'isle Barbe, of which abbey he wrote a history, and published notes and corrections upon the breviary of Lyons, with some other things.

LABRADOR, the same with *New-Britain*.

LABRUS, in ichthyology, a genus of fishes belonging to the order of thoracici. The characters are as follow: The covers of the gills scaly; the branchiostegous rays unequal in number; teeth conic, long, and blunt at their ends; one tuberculated bone in the bottom of the throat; two above, opposite to the other; one dorsal fin reaching the whole length of the back; a slender skin extending beyond each ray, with a rounded tail. There are 41 species of this genus, which vary from each other, even those of the same species, almost infinitely in colour; some of them being of a dirty red mixed with a certain duskiness; others most beautifully striped, especially about the head, with the richest colours, such as blue, red, and yellow. Care must therefore be taken not to multiply the species from these accidental tints, but to attend to the form, which never varies. Mr Pennant mentions his having seen a species of labrus taken about the Giant's Causeway in Ireland, of a most beautiful vivid green, spotted with scarlet; and others at Bannadorgan in the county of Sligo, of a pale green. To this genus belongs the fish called by the English the *old-wife*.

LABURNUM, in botany. See *CYTISUS*.

LABYRINTH, among the ancients, was a large intricate edifice cut out into various aisles and meanders running into each other, so as to render it difficult to get out of it.

There is mention made of four celebrated labyrinths among the ancients, ranked by Pliny in the number of the wonders of the world; viz. the Cretan, Egyptian, Lemnian, and Italian.

That of Crete is the most famed: it was built by Dædalus; and it was hence that Theseus made his escape by mean of Ariadne's clue.

That of Egypt, according to Pliny, was the oldest of all, and was subsisting in his time, after having stood 3600 years. He says it was built by king Petefucus, or Tithoes; but Herodotus makes it the work of several kings: it stood on the banks of the lake Myris, and consisted of 12 palaces, and 1500 apartments: Mela says, *ter mille domos*.

That of Lemnos was supported by columns of wonderful beauty; there were some remains of it at the time when Pliny wrote.—That of Italy, was built by Porfenna king of Heturia for his tomb.

LABYRINTH of the Ear. See *ANATOMY*, n° 405, h, i, k, l.

LAC, MILK, among physicians. See *MILK*.

LACARRY (Giles), a learned Jesuit of the 17th century, was born in the diocese of Caister, in Languedoc, in 1605. He taught philosophy, theology, and the holy Scriptures, in his society; was rector of the college of Cahors; and became well skilled in history. He wrote many works; the principal of which are, 1. *Hist. Galliarum sub Prasæfiliu Prætorii Galliarum*, 4to, a work which is much esteemed, and extends from the reign of Constantine to that of Justinian. 2. *Historia Romana à Julio Cesare ad Constan-*

*tinum Magnum, per numismata & marmora antiqua*, an excellent work. 3. *Építome historia Reg. Franciæ, ex Dionysio Petavio excerpta*, also much esteemed. 4. An edition of Velleius Paterculus, with learned notes.

LACCA, Lac, or *Gum-Lac*, is a kind of wax, of which a species of winged ants form cells upon trees, like honeycombs. In these cells remain some of the dead insects, which give a red colour to the whole substance of the lac. That called *stick-lac* is the wax adhering to some of the small branches of the tree, and which is unprepared. This lac, when separated from the adhering sticks, and grossly powdered, and deprived of its colour by digestion with menstrums, for the sake of the dyes and other purposes, is called *feed-lac*; and lastly, when the stick-lac is freed from impurities, by melting it over a gentle fire, and formed into cakes, it is called *shell-lac*. Lac is unsoluble in water; and difficultly soluble in spirit of wine, which for that purpose must be well dephlegmated. According to Neuman, 16 ounces of feed-lac, distilled in an open fire, yielded nine ounces and six drams of a butter or thick oil, one ounce six drams of a watery liquor neither acid nor alkaline, and a residuum weighing two ounces and a half. It is used in the preparation of spirit varnishes, for the making of sealing-wax, and as a colouring material for dying scarlet. The colour given by lac is less beautiful, but more durable, than that given by cochineal. To render the colouring matter of the lac diffusible in water, so as to be applied to the stuffs to be dyed, Mr Hellot directs the following process: Let some powdered gum-lac be digested during two hours in a decoction of comfrey root, by which a fine crimson colour is given to the water, and the gum is rendered pale or straw-coloured. To this tincture, poured off clear, let a solution of alum be added; and when the colouring matter has subsided, let it be separated from the clear liquor and dried. It will weigh about  $\frac{1}{2}$  of the quantity of lac employed. This dried fecula is to be dissolved or diffused in warm water, and some solution of tin is to be added to it, by which it acquires a vivid scarlet colour. This liquor is to be added to a solution of tartar in boiling water; and thus the dye is prepared.

LACE, in commerce, a work composed of many threads of gold, silver, or silk, interwoven the one with the other, and worked upon a pillow with spindles according to the pattern designed. The open work is formed with pins, which are placed and displaced as the spindles are moved. The importation of gold and silver lace is prohibited.

*Method of Cleaning Gold-LACE and Embroidery when tarnished*.—For this purpose alkaline liquors are by no means to be used; for while they clean the gold, they corrode the silk, and change or discharge its colour. Soap also alters the shade, and even the species of certain colours. But spirit of wine may be used without any danger of its injuring either the colour or quality of the subject; and in many cases proves as effectual, for restoring the lustre of the gold, as the corrosive detergents. A rich brocade, flowered with a variety of colours, after being disagreeably tarnished, had the lustre of the gold perfectly restored by washing it with a soft brush dipped in warm spirit of wine; and some of the colours of the silk, which were likewise faded,

Lacca,  
Lacc.

Lace. became at the same time remarkably bright and lively. Spirit of wine seems to be the only material adapted to this intention, and probably the boasted secret of certain artists is no other than this spirit disguised. Among liquids, Dr Lewis says, he does not know of any other that is of sufficient activity to discharge the foul matter, without being hurtful to the silk: as to powders, however fine, and however cautiously used, they scratch and wear the gold, which here is only superficial and of extreme tenuity.

But tho' spirit of wine is the most innocent material that can be employed for this purpose, it is not in all cases proper. The golden covering may be in some parts worn off; or the base metal, with which it had been iniquitously alloyed, may be corroded by the air, so as to leave the particles of the gold disunited; while the silver underneath, tarnished to a yellow hue, may continue a tolerable colour to the whole: in which cases it is apparent, that the removal of the tarnish would be prejudicial to the colour, and make the lace or embroidery less like gold than it was before. A piece of old tarnished gold-lace, cleaned by spirit of wine, was deprived, with its tarnish, of greatest part of its golden hue, and looked now almost like silver-lace.

*Method of separating the Gold and Silver from Lace without burning it.* Cut the lace in pieces, and (having separated the thread from it by which it was sewed to the garment) tie it up in a linen cloth, and boil it in soap-ley, diluted with water, till you perceive it is diminished in bulk; which will take up but a little time, unless the quantity of lace be very considerable. Then take out the cloth, and wash it several times in cold water, squeezing it pretty hard with your foot, or beating it with a mallet, to clear it of the soap-ley; then untie the cloth, and you will have the metallic part of the lace pure, and nowhere altered in colour or diminished in weight.

This method is abundantly more convenient and less troublesome than the common way of burning; and as a small quantity of the ley will be sufficient, the expence will be trifling, especially as the same ley may be used several times, if cleared of the filky calcination. It may be done in either an iron or copper vessel.

The ley may be had at the soap-boilers, or it may be made of pearl-ash and quick-lime boiled together in a sufficient quantity of water.

The reason of this sudden change in the lace will be evident to those who are acquainted with chemistry: for silk, on which all our laces are wove, is an animal-substance, and all animal-substances are soluble in alkalies, especially when rendered more caustic by the addition of quick-lime; but the linen you tie it in, being a vegetable, will remain unaltered.

*Bone-Lace*, a lace made of fine linen thread or silk, much in the same manner as that of gold and silver. The pattern of the lace is fixed upon a large round pillow, and pins being stuck into the holes or openings in the patterns, the threads are interwoven by means of a number of bobbins made of bone or ivory, each of which contains a small quantity of fine thread, in such a manner as to make the lace exactly resemble the pattern. There are several towns in England, and particularly in Buckinghamshire, that carry on this manufacture; but vast quantities of the finest laces have

been imported from Flanders.

LACEDÆMON. See SPARTA.

LACERTA, the LIZARD, in zoology, a genus of amphibious animals, belonging to the order of reptilia, the characters of which are these: The body is naked, with four feet, and a tail. There are 49 species, the most remarkable are,

I. The *crocodylus*, or crocodile, has a compressed jagged tail, five toes on the fore-foot, and four on the hind-foot. This is the largest animal of the lizard kind. One that was dissected at Siam, an account of which was sent to the Royal Academy at Paris, was 18 feet and a half long, of which the tail was no less than five feet and a half, and the head and neck above two and a half. He was four feet and nine inches in circumference where thickest.

The hinder legs, including the thigh and the paw, were two feet and two inches long; the paws, from the joint to the extremity of the longest claws, were above nine inches. They were divided into four toes; of which three were armed with large claws, the longest of which was an inch and a half, and seven lines and a half broad at the root. The fourth toe was without a nail, and of a conical figure; but was covered with a thick skin like shagreen leather. These toes were united with membranes like those of ducks, but much thicker.

The fore-legs had the same parts and conformation as the arms of a man, both within and without; but they were somewhat shorter than those behind. The hands had five fingers, the two last of which had no nails, and were of a conical figure, like the fourth toe on the hind paws. The head was long, and had a little rising at the top; but the rest was flat, and especially towards the extremity of the jaws. It was covered with a skin, which adhered firmly to the skull and to the jaws. The skull was rough and unequal in several places; and about the middle of the forehead there were two bony crests, about two inches high. They were not quite parallel, but separated from each other in proportion as they mounted upwards.

The eye was very small in proportion to the rest of the body, and was placed within its orbit, that the outward part, when shut, was only a little above an inch in length, and run parallel to the opening of the jaws.

The nose was placed in the middle of the upper jaw, near an inch from its extremity, and was perfectly round and flat, being two inches in diameter, of a black, soft, spongy substance, not unlike the nose of a dog. The nostrils were in the form of a Greek capital  $\pi$ ; and there were two caruncles which filled and closed them very exactly, and which opened as often as he breathed through the nose. The jaws seemed to shut one within another by means of several apophyses, which proceeded from above downwards, and from below upwards, there being cavities in the opposite jaw to receive them. They had 27 dog-teeth in the upper jaw, and 15 in the lower, with several void spaces between them. They were thick at the bottom, and sharp at the point; being all of different sizes, except ten large hooked ones, six of which were in the lower jaw, and four in the upper. The mouth was 15 inches in length, and eight and a half in breadth where broadest; and the distance of the two jaws, when open-

Lacedæmon, Lacerta.



Fig. 2.  
HELEN PORATIA.



Fig. 4. LACERTA CROCODILUS or  
CROCODILE



Fig. 5. HEMIOTIS



Fig. 3. LACERTA  
CHAMAELEON.



Fig. 6.  
LACERTA BASILEUS.



Fig. 8.  
SHEPHERD LAMB.



Fig. 7. SHEPHERD LAMB



A Bell Sculp.



ed as wide as they could be, was 15 inches and a half. The skull, between the two crests, was proof against a musket-ball, for it only rendered the part a little white that it struck against.

The colour of the body was of a dark brown on the upper part, and of a whitish citron below, with large spots of both colours on the sides. From the shoulders to the extremity of the tail he was covered with large scales of a square form, disposed like parallel girdles, and were 52 in number; but those near the tail were not so thick as the rest. In the middle of each girdle there were four protuberances, which became higher as they approached the end of the tail, and composed four rows, of which the two in the middle were lower than the remaining two, forming three channels, which grew deeper the nearer they came to the tail, and were confounded with each other about two feet from its extremity.

The skin was defended with a sort of armour, which, however, was not proof against a musket-ball, contrary to what has been commonly said. However, it must be acknowledged, that the attitude in which it was placed might contribute not a little thereto; for probably, if the ball had struck obliquely against the shell, it would have flown off. Those parts of the girdles underneath the belly were of a whitish colour, and were made up of scales of divers shapes. They were about one-sixth of an inch in thickness, and were not so hard as those on the back.

This creature lays eggs, which it covers over with sand, and leaves to be hatched by the heat of the sun. They are to be met with in the river Nile, Niger, and Ganges, besides most other large rivers in the southern parts of Asia, Africa, and America.

Mr Hasselquist informs us, that the crocodile swallows stones to assist digestion, after the manner of seed-eating birds, which commit to the stomach the work of mastication as well as concoction, being destitute of the instruments adapted to that purpose. The Egyptians say, that his excrements do not pass by the anus: this seems to be confirmed by the structure of the gut, which is near the pylorus; for it cannot easily be conceived, that excrements should pass thro' such a narrow passage, seemingly destined for the conveyance of the chyle only; but the structure of the parts, and the gut being so near the pylorus, seem to indicate that the excrements pass through it into the ventricle, and are vomited up. The inhabitants above Cairo say they see this daily; and observe, that the crocodile is obliged to come on shore as often as he has occasion to ease himself. There is a folliculus, of the bigness of a hazel-nut, under the shoulders of the old crocodiles, which contains a thick matter, smelling like musk. The Egyptians are very anxious to get this when they kill a crocodile, it being a perfume much esteemed by the grandees. When the male copulates with the female, he turns her with his snout on her back. The Egyptians use the fat against the rheumatism and stiffness of the tendons, esteeming it a powerful remedy outwardly applied. They say the gall is good for the eyes; they make use of it as a certain remedy for barrenness in women, taking about six grains internally, and outwardly they apply a pessus made of cotton and the gall of a crocodile. The eyes of the crocodile are the best aphrodisiacs of any known by the Arabs; who

prefer them to all confessions dea-satyrii, hyacinthi, &c. and even to ambergrae.

The crocodile is a very dangerous and terrible animal in some countries. It does a great deal of mischief among the common people of Upper Egypt, often killing and devouring women who come to the river to fetch water, and children playing on the shore or swimming in the river. In the stomach of one dissected before Mr Barton the English consul, they found the bones of the legs and arms of a woman, with the rings which they wear in Egypt as ornaments. These animals are seen in some places lying for whole hours, and even days, stretched in the sun and motionless; so that one not used to them might mistake them for trunks of trees covered with a rough and dry bark: but the mistake would soon be fatal; for the seemingly torpid animal, at the near approach of any living creature, instantly darts upon it, and carries it to the bottom. In the times of an inundation they sometimes enter the cottages of the natives, where they seize the first animal they meet with. There have been several examples of their taking a man out of a canoe in the sight of his companions, without their being able to lend him any assistance. The crocodile, however, except when pressed with hunger, or with a view of depositing its eggs, seldom leaves the water. Its usual method is to float along upon the surface, and seize whatever animals come within its reach; but when this method fails, it then goes closer to the bank. There it waits in patient expectation of some land-animal that comes to drink; the dog, the bull, the tiger, or man himself. Nothing is to be seen as the animal approaches, nor is its retreat discovered till it is too late for safety. It seizes the victim with a spring, and goes at a bound much faster than such an unwieldy animal could be supposed to do; then having secured the creature both with teeth and claws, it drags it into the water, instantly sinks with it to the bottom, and in this manner quickly drowns it. Sometimes it happens, that the creature wounded by the crocodile makes its escape; in which case, the latter pursues with great celerity, and often takes it a second time. In these depredations, however, this terrible animal often seizes on another as formidable as itself, and meets with a desperate resistance. We are told of frequent combats between the crocodile and the tiger. All creatures of the tiger kind are continually oppressed by a parching thirst, that keeps them in the vicinity of great rivers, whither they descend to drink very frequently. On these occasions they are seized by the crocodile; upon whom they instantly turn with the greatest agility, and force their claws into his eyes, while he plunges, with his fierce antagonist, into the river. There they continue to struggle for some time, till at last the tiger is drowned. Notwithstanding all this, however, we are assured by Labat, that a negro, with no other weapon than a knife in his right hand, and his left arm wrapped round with a cow-hide, ventures boldly to attack this animal in its own element. As soon as he approaches the crocodile, he presents his left arm, which the animal swallows most greedily: but as it sticks in his throat, the negro has time to give it several stabs below the chin, where it is easily vulnerable; and the water also getting in at the mouth, which is held involun-

tarily open, the creature is soon bloated up as big as a tun, and expires.

The natives of Siam seem particularly fond of the capture of all the great animals with which their country abounds. The crocodiles are taken by throwing three or four strong nets across a river, at proper distances from each other; so that if the animal breaks through the first, it may be caught by one of the rest. When it is first taken, it employs the tail, which is the grand instrument of strength, with great force; but after many unsuccessful struggles, the animal's strength is at last exhausted. Then the natives approach their prisoner in boats, and pierce him in the most tender parts till he is weakened by loss of blood. When he has done stirring, they begin by tying up his mouth, and with the same cord tie his head to his tail, which last they bend back like a bow. However, they are not yet perfectly secure from his fury; but for their greater safety they tie his forefeet, as well as those behind, to the top of his back. These precautions are not useless; for if they were to omit them, the crocodile would soon recover strength enough to do a great deal of mischief. When thus brought into subjection, or when taken young and tamed, this formidable animal is used to divert and entertain the great men of the east. It is often managed like an horse; a curb is put into its mouth, and the rider directs it as he thinks proper. Though awkwardly formed, it does not fail to proceed with some degree of swiftness; and is thought to move as fast as some of the most unworldly of our own animals, the hog or the cow. Some indeed assert, that no animal could escape it but for its slowness in turning; which, however, seems very improbable, as its back-bone is full of articulations, and seemingly as flexible as that of other large animals.

All crocodiles breed near fresh waters; and though they are sometimes found in the sea, yet that may be considered rather as a place of excursion than abode. They produce their young by eggs, as was said above; and for this purpose, the female, when she comes to lay, chooses a place by the side of a river, or some fresh-water lake, to deposit her brood in. She always pitches upon an extensive sandy shore, where she may dig a hole without danger of detection from the ground being fresh turned up. The shore must also be gentle and helving to the water, for the greater convenience of the animal's going and returning; and a convenient place must be found near the edge of the stream, that the young may have a shorter way to go. When all these requisites are adjusted, the animal is seen cautiously stealing up on shore to deposit her burden. The presence of a man, a beast, or even a bird, is sufficient to deter her at that time; and if she perceives any creature looking on, she infallibly returns. If, however, nothing appears, she then goes to work, scratching up the sand with her fore-paws, and making a hole pretty deep in the shore. There she deposits from 80 to 100 eggs, of the size of a tennis-ball, and of the same figure, covered with a tough white skin like parchment. She takes above an hour to perform this task; and then, covering up the place so artfully that it can scarcely be perceived, she goes back to return again the next day. Upon her return, with the same precaution as before, she lays about the same number of eggs; and the day following also a like number.

Thus having deposited her whole quantity, and having covered them close up in the sand, they are soon vivified by the heat of the sun; and at the end of 30 days, the young ones begin to break open the shell. At this time the female is instinctively taught that her young ones want relief; and she goes upon land to scratch away the sand and set them free. Her brood quickly avail themselves of their liberty; a part run unguided to the water; another part ascend the back of the female, and are carried thither in greater safety. But the moment they arrive at the water, all natural connexion is at an end; when the female has introduced her young to their natural element, not only she, but the male, become amongst the number of their most formidable enemies, and devour as many of them as they can. The whole brood scatters into different parts at the bottom; by far the greatest number are destroyed, and the rest find safety in their agility or minuteness.

But it is not the parent alone that is thus found to thin their numbers; the eggs of this animal are not only a delicious feast to the savage, but are eagerly sought after by every beast and bird of prey. The ichneumon was erected into a deity among the ancients for its success in destroying the eggs of these monsters: at present, that species of the vulture called the *gallinazo* is their most prevailing enemy. All along the banks of great rivers, for thousands of miles, the crocodile is seen to propagate in numbers that would soon over-run the earth, but for the vulture, that seems appointed by Providence to abridge its fecundity. These birds are ever found in great numbers where the crocodile is most numerous; and hiding themselves within the thick branches of the trees that shade the banks of the river, they watch the female in silence, and permit her to lay all her eggs without interruption. Then when she has retired, they encourage each other with cries to the spoil; and flocking all together upon the hidden treasure, tear up the eggs, and devour them in a much quicker time than they were deposited. Nor are they less diligent in attending the female while she is carrying her young to the water; for if any one of them happens to drop by the way, it is sure to receive no mercy.

Such is the extraordinary account given us by late travellers of the propagation of this animal; an account adopted by Linneus and the most learned naturalists of the age. Yet, if one might argue from the general analogy of nature, the crocodile's devouring her own young when she gets to the water seems doubtful. This may be a story raised from the general idea of this animal's rapacious cruelty; when, in fact, the crocodile only seems more cruel than other animals because it has more power to do mischief. It is probable, that it is not more devoid of parental tenderness than other creatures; and we are the more led to think so from the peculiar formation of one of the crocodile kind. This is called the *open-bellied crocodile*, and is furnished with a false belly like the opossum, where the young creep out and in as their dangers or necessities require. The crocodile, thus furnished at least, cannot be said to be an enemy to her own young, since she thus gives them more than parental protection. It is probable also, that this open-bellied crocodile is viviparous, and fosters her young that are prematurely excluded in this second womb, until they

come

come to proper maturity.

How long the crocodile lives, we are not certainly informed: if we may believe Aristotle, it lives the age of a man; but the ancients so much amused themselves in inventing fables concerning this animal, that even truth from them is suspicious. What we know for certain from the ancients is, that among the various animals that were produced to fight in the amphitheatre at Rome, the combat of the crocodile was not wanting. Marcus Scaurus produced them living in his unrivalled exhibitions; and the Romans considered him as the best citizen, because he furnished them with the most expensive entertainments.

The last mentioned kind of crocodile is a species not described by Linnæus. Mr Edwards tells us, that three of these creatures were sent from Bengal, about the year 1747, to the late Dr Mead physician in ordinary to the king. Two of these the Doctor preferred in his collection, and presented the third to the late curious Mrs Kennon; and since the decease of these worthy persons, they became the property of Mr James Lemon of London, who obliged our author with one of them to produce to the royal society. The narrowness of the beak is the most extraordinary circumstance in this crocodile, which appears like the bill of the bird called *goosander*. It has small sharp teeth. Another peculiarity is a paunch or open purse in the middle of the under side of the belly, which seems to be naturally formed with round hips, and hollow within, to receive its young in time of danger, as it appears in the American animal called *opossum*. Dr Parson gave it as his opinion, that the opening in the belly was really natural, it having no appearance of being cut or torn open. In other respects it hath all the marks common to alligators or crocodiles. The beak was finely creased transversely. The animal appeared, in the spirits, all over of a yellowish oval colour, the under side lighter than the upper, the latter having some dusky marks and spots. This species inhabits the banks of the Ganges; and it is very strange that they should never have been described before, as our India company have been so long settled there, and the animal is, at full growth, nearly, if not altogether, as large as the common crocodile.

II. The *caudiverbera*, has a depressed pinnatifid tail, and palmated feet. It is larger than the common green lizard, is found in Peru, and has got its name from its beating the ground with its tail.

III. The *stellio* has a verticillated tail, and dentated scales. It is a native of Africa, and the warm parts of Asia. It frequents the ruinous walls of Natolia, Syria, and Palestine. The Arabs call it *hardun*. The Turks kill it; for they imagine, that, by declining the head, it mimics them while they say their prayers.

IV. The *agilis*, has a pretty long verticillated tail, with sharp scales, and a scaly collar. This is the common green lizard, and is a native both of Europe and India. This species is extremely nimble: in hot weather, it basks on the sides of dry banks or old trees; but, on being observed, immediately retreats to its hole. The food of this species, as well as of all the other British lizards, is insects; and they themselves are devoured by birds of prey. They are all perfectly harmless; yet their form strikes one with disgust, and has occasioned great obscurity in their history.

Mr Pennant mentions a lizard killed in Worcestershire in the year 1714, which was two feet six inches long, and four inches in girth. The fore-legs were placed eight inches from the head; the hind-legs five inches beyond those: the legs were two inches long; the feet divided into four toes, each furnished with a sharp claw. Another of the same kind was afterwards killed in that county; but whether these large lizards were natives of other countries and imported into England, or whether they were of British growth, is uncertain.

5. The chameleon has a crooked cylindrical tail. The head of a large chameleon is almost two inches long, and from thence to the beginning of the tail it is four inches and a half. The tail is five inches long, and the feet two and a half. The thickness of the body is different at different seasons; for sometimes from the back to the belly it is two inches, and sometimes but one; for he can blow himself up and contract himself at pleasure. This swelling and contraction is not only of the back and belly, but of the legs and tail.

These different motions are not like those of other animals, which proceed from a dilatation of the breast in breathing, and which rises and falls successively; but they are very irregular, as in tortoises and frogs. The chameleon has continued as it were blown up for two hours together, and then he would grow less and less insensibly; for the dilatation was always more quick and visible than the contraction. In this last state he appeared extremely lean, and the spine of the back was sharp, and all his ribs might be told; likewise the tendons of the arms and legs might be seen very distinctly.

The skin is very cold to the touch; and notwithstanding he seems so lean, there is no feeling the beating of the heart. The surface of the skin is unequal, and has a grain not unlike shagreen, but very soft, because each eminence is as smooth as if it was polished. Some of these are as large as a middling pin's head on the arms, legs, belly, and tail; but on the shoulders and head they are of an oval figure, and a little larger. Those under the throat are ranged in the form of a chaplet, from the lower lip to the breast. Some on the head and back are amassed together in clusters, with spaces between them, on which are almost imperceptible spots of a pale red and yellow colour, as well as the ground of the skin itself, which plainly appears between these clusters. This ground changes colour when the animal is dead, becoming of a greyish brown, and the small spots are whitish.

The colour of all these eminences, when the chameleon is at rest in a shady place, is of a bluish grey, except on the claws, where it is white with a little yellow; and the spaces between the clusters is of a pale red and yellow, as was before observed. But when he is in the sun, all parts of the body which are affected with the light, become of a greyish brown, or rather of a tawny. That part of the skin which the sun does not shine on, changes into several brighter colours, which form spots of the size of half one's finger. Some of these descend from the spine half way on the back; and others appear on the sides, arms, and tail. They are all of an isabella colour, from a mixture of a pale yellow and of a bright red, which is the colour of the ground of the skin.



The head of a chameleon is not unlike that of a fish, it being joined to the breast by a very short neck, covered on each side with cartilaginous membranes resembling the gills of fishes. There is a crest directly on the top of the head, and two others on each side above the eyes, and between these there are two cavities near the top of the head. The muzzle is blunt, and not much unlike that of a frog: at the end there is a hole on each side for the nostrils; but there are no ears, nor any sign of any.

The jaws are furnished with teeth, or rather with a bone in the form of teeth, which he makes little or no use of, because he lives upon swallowing flies and other insects, without chewing them; and hence arose the vulgar notion of his living upon air, because he was never seen to eat. The form, structure, and motion of the eyes, have something very particular; for they are very large, being almost half an inch in diameter. They are of a globous figure; which may be easily seen, because they stand out of the head. They have a single eye-lid like a cap, with a hole in the middle, through which the sight of the eye appears, which is of a shining brown, and round it there is a little circle of a gold colour. This eye-lid has a grain like shagreen, as well as the other parts of the skin; and when the rest of the body changes colour, and assumes spots of different shapes, those on the lid always keep the same form, though they are tintured with the same colour as the skin. But the most extraordinary thing relating to the eyes is, that this animal often moves one when the other is entirely at rest; nay, sometimes one eye will seem to look directly forward and the other backward, and one will look up to the sky when the other regards the earth.

That part of the body which is called the *trunk*, and comprehends the thorax and the belly in a chameleon, is almost all thorax, with little or no belly. The four feet are all of a length; and the only difference between them is, that those before are turned backwards, and those behind forwards. There are five toes on each paw, which have a greater resemblance to hands than feet. They are all divided into two, which gives the appearance of two hands to each arm, and two feet to each leg; and though one of these parts have three toes, and the other but two, yet they seem to be all of the same size. These toes lie together under the same skin as in a mitten; however, their shape might be seen through the skin. With these paws the chameleon can lay hold of the small branches of trees in the same manner as a parrot. When he is about to perch, he parts his toes differently from birds, because he puts two behind and two before. The claws are little, crooked, very sharp, and of a pale yellow, proceeding but half way out of the skin, while the other half is hid beneath it. His walk is slower than that of a tortoise, and he seems to move along with an affectation of gravity. He seems to seek for a proper place to set his feet upon; and when he climbs up trees, he does not trust to his feet like squirrels, but endeavours to find out clefts in the bark, that he may get a surer hold.

His tail is like that of a viper, when it is puffed up and round; for otherwise the bones may be seen in the same manner as on the back. He always wraps his tail round the branches of trees, and it serves him

as it were instead of a fifth hand. — He is a native of Africa and Asia. Mr Hasselquist is of opinion, that the change of colour in the chameleon is owing to its being exceedingly subject to the jaundice, which particularly happens either when it is exposed to the sun, or when it is made angry. The mixture of the bile with its blood is then very perceptible, and, as the skin is transparent, makes it spotted with green and yellow. He never saw it coloured with red, blue, or purple; and does not believe that ever it assumes these colours.

6. The gecko has a cylindrical tail, concave ears, and a warty body. It is the indian salamander of Bontius. "This animal is very frequent in Cairo, (says Hasselquist), both in the houses and without them. The poison of this animal is very singular, as it exhales from the lobuli of the toes. The animal seeks all places and things impregnated with sea-salt, and, passing over them several times, leaves this very noxious poison behind it. In July 1750, Mr Hasselquist saw two women and a girl in Cairo at the point of death, from eating cheese new salted, bought in the market, and on which this animal had dropt its poison. Once at Cairo, I had an opportunity of observing how acrid the exhalations of the toes of this animal are, as it ran over the hand of a man who endeavoured to catch it; there immediately rose little pustules over all those parts the animal had touched; these were red, inflamed, and smarted a little, greatly resembling those occasioned by the stinging of nettles. It emits an odd sound, especially in the night, from its throat, not unlike that of a frog."

7. The scincus has a cylindrical tail compressed at the point, and blunt margined toes. This animal is found in Arabia Petrea near the Red Sea, and in Upper Egypt near the Nile. It is much used by the inhabitants of the east as an aphrodisiac, but not at this time by the Europeans. The flesh of the animal is given in powder, with some stimulating vehicle; broth made of the recent flesh is likewise used by the Arabs. It is brought from Upper Egypt and Arabia to Alexandria, whence it is carried to Venice and Marseilles, and from thence to all the apothecaries shops of Europe. It has been an error common to almost all authors, to imagine the scincus to be a fish.

8. The nictolita has a long tail with a triangular edge, and four lines of scales on the back. It is met with in the moist places of Egypt near the Nile. The Egyptians say that this lizard proceeds from the eggs of the crocodile laid in the sand, but that the crocodile proceeds from those laid in the water. Mr Hasselquist hath detected the fallacy of this account.

9. The palustris has a lanceolated tail, and four toes on the fore-feet, and inhabits the stagnating waters of Europe. It has a slow and crawling pace. Mr Pennant mentions his having more than once found, under stones and old logs, some very minute lizards that had much the appearance of this kind: they were perfectly formed, and had not the least vestiges of fins; which circumstance, joined to their being found in a dry place remote from water, seems to indicate, that they had never been inhabitants of that element, as it is certain many of our lizards are in their first state. At that period they have a fin above and below their tail; that on the upper part extends along the back as far as the head; but both drop off as soon as the animal takes



Fig. 1.  
STRAD-  
le's ship.



Fig. 6.  
LEMON TARDIGRADA.  
or toothy HARMONICA.



Fig. 2.

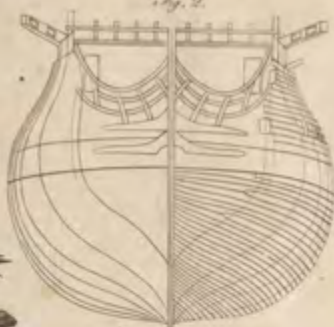


Fig. 3.  
HARMONICA.



Fig. 7.  
LEMON TARDIGRADA.  
or toothy HARMONICA.



Fig. 5.  
LOPHUS TIBETANUS.  
or common dragon.



Fig. 4. The open bellied, or  
narrow-headed  
LACERTA.



Fig. 8.  
LEPAS AMERICANA.  
(see figure)





**Laches** takes to the land, being then no longer of any use. Mr Ellis has remarked certain pennated fins at the gills of one very common in most of our stagnating waters, and which is frequently observed to take a bait like a fish.

10. The salamandra, or salamander, has a short cylindrical tail, four toes on the fore-feet, and a naked porous body. This animal has been said, even in the Philosophical Transactions, to live in the fire; but this is found to be a mistake. Its properties are very little known. It is found in the southern countries of Europe.

11. The basiliskus, has a long cylindrical tail, a diated fin on the back, and a crest on the throat. It is a native of the Indies. See fig. 6.

**LACHES**, (from the French *lacher*, i. e. *laxare*, or *lache*, *ignavus*), in the English law signifies slackness or negligence, as it appears in Littleton, where *laches of entry* is a neglect of the heir to enter. And probably it may be an old English word: for where we say there is *laches of entry*, it is all one as if it were said there is a *lack of entry*; and in this signification it is used. No *laches* shall be adjudged in the heir within age; and regularly, *laches* shall not bar infants or femme covert for not entry or claim, to avoid descents; but *laches* shall be accounted in them for non-performance of a condition annexed to the state of the land.

**LACHRYMAL**, in anatomy, an appellation given to several parts of the eye. See ANATOMY, n° 406.f.

**LACHRYMATORY**, in antiquity, a vessel wherein were collected the tears of a deceased person's friends, and preserved along with the ashes and urn. They were small glass or earthen bottles, chiefly in the form of phials. At the Roman funerals, the friends of the deceased, or the *præfæta*, women hired for that purpose, used to fill them with their tears, and deposit them very carefully with the ashes, in testimony of their sorrow; imagining the manes of the deceased were thereby greatly comforted. Many specimens of them are preserved in the cabinets of the curious, particularly in the British Museum.

**LACINIUM**, (anc. geog.) a noble promontory of the Bruttii in Italy, the south boundary of the Sinus Tarentinus and the Adriatic; all to the south of it being deemed the Ionian Sea: it was famous for a rich temple of Juno, furnished *Lacinia*, with a pillar of solid gold standing in it; which Hannibal intending to carry off, was, according to Cicero, dissuaded by a dream. Now *Capo delle Colonne*, from the columns of Juno's temple still standing on the north-east coast of the Calabria ultra.

**LACQUERS**, are varnishes applied upon tin, brass, and other metals, to preserve them from tarnishing, and to improve their colour. The basis of lacquers is a solution of the resinous substance called *seed lac*, in spirit of wine. The spirit ought to be very much dephlegmated, in order to dissolve much of the lac. For this purpose, some authors directly dry potash to be thrown into the spirit. This alkali attracts the water, with which it forms a liquid that subsides distinctly from the spirit at the bottom of the vessel. From this liquid the spirit may be separated by decantation. By this method the spirit is much dephlegmated; but, at the same time, it becomes im-

pregnated with part of the alkali, which depraves its colour, and communicates a property to the lacquer of imbibing moisture from the air. These inconveniences may be prevented by distilling the spirit; or, if the artill has not an opportunity of performing that process, he may cleanse the spirit in a great measure from the alkali, by adding to it some calcined alum; the acid of which uniting with the alkali remaining in the spirit, forms with it a vitriolated tartar, which, not being soluble in spirit of wine, falls to the bottom together with the earth of the decomposed alum. To a pint of the dephlegmated and purified spirit, about three ounces of powdered shell-lac are to be added; and the mixture to be digested during some day with a moderate heat. The liquor ought then to be poured off, strained, and cleared by settling. This clear liquor is now fit to receive the required colour from certain resinous colouring substances; the principal of which are gamboge and annatto; the former of which gives a yellow, and the latter an orange colour. In order to give a golden colour, two parts of gamboge are added to one of annatto; but these colouring substances may be separately dissolved in the tincture of lac, and the colour required may be adjusted by mixing the two solutions in different proportions. When silver leaf, or tin, are to be lacquered, a larger quantity of the colouring materials are requisite than when the lacquer is intended to be laid on brass.

**LACTATIO**, **LACTATION**, or *Giving Suck*. The mother's-breast, if possible, should be allowed the *Medical Dictionary* child, at least during the first month; for thus the child is more peculiarly benefited by what it sucks, and the mother is preserved from more real inconveniences, than the falsely delicate imagine they would suffer by compliance herewith: but if by reason of an infirm constitution, or other causes, the mother cannot suckle her child, let dry nursing under the mother's eye be pursued.

When women lose their appetite by giving suck, both the children and themselves are thereby injured; wet nurses are to be preferred, who during the time they give the breast, have rather an increased appetite, and digest more quickly; the former are apt to waste away, and sometimes die consumptive. In short, those nurses with whom lactation may for a while agree, should wean the child as soon as their appetite lessens, their strength seems to fail, or a tendency to hysteric symptoms are manifest.

When the new-born child is to be brought up by the mother's breast, apply it thereto in ten or twelve hours after delivery; thus the milk is sooner and more easily supplied, and there is less hazard of a fever, than when the child is not put to it before the milk begins to flow of itself.

If the mother does not suckle her child, her breasts should be so kept warm with flannels, or with a hare-skin, that a constant perspiration may be supported; thus there rarely will arise much inconvenience from the milk.

The child, notwithstanding all our care in dry nursing, sometimes pines if a breast is not allowed. In this case a wet nurse should be provided, if possible one that hath not been long delivered of a child. She should be young, of a healthy habit, and an active disposition, a mild temper, and whose breasts are well filled

*Lactantius*,  
*Lactical*.

filled with milk. If the milk is good, it is sweetish to the taste, and totally free from saltness; to the eye it appears thin, and of a bluish cast. That the woman hath her menses, if in other respects objections are not made, this need not be any; and as to the custom with many, of abstaining from venery while they continue to suckle a child, it is so far without reason to support it, that the truth is, a rigorous chastity is as hurtful, and often more pernicious, than an immoderate use of venery. Amongst the vulgar errors, is that of red-haired women being improper for wet nurses.

If the menses do not appear during the first months, but after six or eight months suckling they begin to descend, the child should be weaned.

Wet nurses should eat at least one hearty meal of animal-food every day; with this, a proper quantity of vegetables should be mixed. Thin broth, or milk, are proper for their breakfasts and their suppers; and if the strength should seem to fail a little, a draught of good ale should now and then be allowed: but spirituous liquors must, in general, be foreborn; not but a spoonful of rum may be allowed in a quart of milk and water, (*i. e.* a pint of each), which is a proper common drink.

Though it is well observed by Dr Hunter, that the far greater number of those women who have cancers in the breast or womb, are old maids, and those who refuse to give suck to their children; yet it is the unhappiness of some willing mothers not to be able: for instance, those with tender constitutions, and who are subject to nervous disorders; those who do not eat a sufficient quantity of solid food, nor enjoy the benefit of exercise and air: if children are kept at their breasts, they either die whilst young, or are weak and sickly after childhood is past, and so on through remaining life.

**LACTANTIUS** (*Lucius Cælius Firmianus*), a celebrated author at the beginning of the 4th century, was, according to Baronius, an African; but, according to others, was born at Fermo in the marquise of Anconia, from whence it is imagined he was called *Firmianus*. He studied rhetoric under Arnobius; and was afterwards a professor of that science in Africa and Nicomedia, where he was so admired, that the emperor Constantine chose him preceptor to his son Crispus Cæsar. Lactantius was so far from seeking the pleasures and riches of the court, that he lived there in poverty, and, according to Eusebius, frequently wanted necessaries. His works are written in elegant Latin. The principal of which are, 1. *De ira divina*. 2. *De operibus Dei*, in which he treats of the creation of man, and of divine providence. 3. *Divine Institutions*, in seven books. This is the most considerable of all his works: he there undertakes to prove the truth of the Christian religion, and to refute all the difficulties that had been raised against it; and he solidly and with great strength attacks the illusions of paganism. His style is pure, clear, and natural, and his expressions noble and elegant, on which account he has been called the *Cicero of the Christians*. There is also attributed to him a treatise *De morte persecutorum*; but several of the learned doubt its being written by Lactantius. The most copious edition of Lactantius's works is that of Paris, in 1748, 2 vols 4to.

**LACTEAL VESSELS.** See ANATOMY, n° 369.

**LACTIFEROUS**, an appellation given to plants *Lactiferous*, abounding with a milky juice, as the fow-thistle and the like. The name of *lactiferous*, or *lactescent*, is given to all those plants which abound with a thick-coloured juice, without regarding whether it is white or not. Most lactiferous plants are poisonous, except those with compound flowers, which are generally of an innocent quality.

Of the poisonous lactescent plants the most remarkable are fumach, agaric, maple, burning thorny plant, cassida, celandine, puccoon, prickly poppy, and the plants of the natural order *contorta*, as swallow-wort, apocynum, cynanchum, and cerbera.

The bell-shaped flowers are partly noxious, as cardinal flower; partly innocent, as campanula.

Among the lactescent plants with compound flowers that are innocent in their quality, may be mentioned dandelion, picris, hyoseris, wild lettuce, gum-fucoscy, hawk-weed, bastard hawk-weed, hypochaeris, goat's-beard, and most species of lettuce: we say most species, because the prickly species of that genus are said to be of a very virulent and poisonous nature; though Mr Lightfoot denies this, and affirms that they are a safe and gentle opiate, and that a syrup made from the leaves and stalks is much preferable to the common diacodium.

**LACTUCA**, **LETTUCE**; a genus of the polygamia æqualis order, belonging to the syngenesia class of plants. There are several species, most of which are plants of no use, and never cultivated but in botanic gardens for variety. Those commonly cultivated in the kitchen-garden for use are, 1. The common or garden lettuce. 2. Cabbage lettuce. 3. Silesia lettuce. 4. Dutch brown lettuce. 5. Aleppo lettuce. 6. Imperial lettuce. 7. Green capuchin lettuce. 8. Verfailles or upright white Cos lettuce. 9. Black Cos. 10. Red Cos. 11. Red capuchin lettuce. 12. Roman lettuce. 13. Prince lettuce. 14. Royal lettuce. 15. Egyptian Cos lettuce.

The first of these sorts is very common in all gardens, and is commonly sown for cutting very young, to mix with other salad herbs in spring; and the second, or cabbage-lettuce, is only this mended by culture. It may be sown at all times of the year, but in the hot months requires to be sown in shady borders. The cabbage-lettuce may also be sown at different seasons, to have a continuation of it through the summer. The first crop should be sown in February, in an open situation; the others, at three weeks distance; but the later ones under covert, but not under the drippings of trees.

The Silesia, imperial, royal, black, white, and upright Cos lettuces, may be sown in the latter end of February or the beginning of March, on a warm light soil, and in an open situation; when the plants are come up, they must be thinned to 15 inches distance every way, they will then require no farther care than the keeping them clear of weeds; and the black Cos, as it grows larger, should have its leaves tied together to whiten the inner part. Succeeding crops of these should be sown in April, May, and June; and toward the latter end of August they may be sowed for a winter crop, to be preserved under glasses, or in a bed arched over with hoops and covered with mats.

The most valuable of all the English lettuces are the



Lacunar  
||  
Ladder.

the white Cos, or the Versailles, the Silesia, and the black Cos. The brown Dutch and the green capuchin are very hardy, and may be sown late, under walls, where they will stand the winter, and be valuable when no others are to be had. The red capuchin, Roman, and prince lettuce, are very early kinds, and are sown for variety; as also the Aleppo ones for the beauty of their spotted leaves.

The milk of the common garden-lettuce is hypnotic, while the root of the plant is cooling, diluent, and nourishing.

LACUNAR, in architecture, an arched roof or ceiling, more especially the planking or flooring above porticos or piazzas.

LACYDES, a Greek philosopher, born at Cyrene, was the disciple of Arcesilaus, and his successor in the academy. He taught in a garden given him by Attalus king of Pergamus; but that prince sending for him to court, he replied, "That the pictures of kings should be viewed at a distance." He imitated his master in the pleasure he took in doing good without caring to have it known: he had a goose which followed him every where, by night as well as by day; and when she died, he made a funeral for her, which was as magnificent as if it had been for a son or a brother. He taught the same doctrine as Arcesilaus; and pretended that we ought to determine nothing, but always to suspend our opinion. He died 212 B.C.

LADDER, a frame made with a number of steps, by means of which people may ascend as on a stair to places otherwise inaccessible.

Scaling LADDERS, in the military art, are used in scaling when a place is to be taken by surprise. They are made several ways: here we make them of flat staves, so that they may move about their pins, and shut like a parallel ruler, for conveniently carrying them: the French make them of several pieces, so as to be joined together, and to be made of any necessary length: sometimes they are made of single ropes, knotted at proper distances, with iron hooks at each end, one to fasten them upon the wall above, and the other in the ground; and sometimes they are made with two ropes, and staves between them, to keep the ropes at a proper distance, and to tread upon. When they are used in the action of scaling walls, they ought to be rather too long than too short, and to be given in charge only to the stoutest of the detachment. The soldiers should carry these ladders with the left arm passed through the second step, taking care to hold them upright close to their sides, and very short below, to prevent any accident in leaping into the ditch.

The first rank of each division, provided with ladders, should set out with the rest at the signal, marching resolutely with their firelocks slung, to jump into the ditch: when they are arrived, they should apply their ladders against the parapet, observing to place them towards the faintest angles rather than the middle of the curtain, because the enemy have less force there. Care must be taken to place the ladders within a foot of each other, and not to give them too much nor too little slope, so that they may not be overturned or broke with the weight of the soldiers mounting upon them.

Laden  
||  
Ladrone.

The ladders being applied, they who have carried them, and they who come after, should mount up, and rush upon the enemy sword-in-hand: if he who goes first, happens to be overturned, the next should take care not to be thrown down by his comrade; but, on the contrary, immediately mount himself, so as not to give the enemy time to load his piece.

As the soldiers who mount first may be easily tumbled over, and their fall may cause the attack to fail, it would perhaps be right to protect their breasts with the fore-parts of cuirasses; because, if they can penetrate, the rest may easily follow.

The success of an attack by scaling is infallible, if they mount the four sides at once, and take care to shower a number of grenades amongst the enemy, especially when supported by some grenadiers and piquets, who share the attention and fire of the enemy.

LADEN, in the sea-language, the state of a ship when she is charged with a weight or quantity of any sort of merchandizes, or other materials, equal to her tonnage or burthen. If the cargo with which she is laden is extremely heavy, her burthen is determined by the weight of the goods; and if it is light, she carries as much as she can *flow*, to be fit for the purposes of navigation. As a ton in measure is generally estimated at 2000 lb. in weight, a vessel of 200 tons ought accordingly to carry a weight equal to 400,000 lb. when the matter of which the cargo is composed is specifically heavier than the water in which she floats; or, in other words, when the cargo is so heavy that she cannot float high enough with to great a quantity of it as her hold will contain.

LADEN *in Bulk*, the state of being freighted with a cargo which is neither in casks, boxes, bales, nor casks, but lies loose in the hold; being defended from the moisture or wet of the hold, by a number of mats and a quantity of *dunage*. Such are usually the cargoes of corn, salt, or such materials.

LADENBURG, a town of Germany in the Palatinate of the Rhine, seated on the river Neckar, in E. Long. 8. 42. N. Lat. 49. 27. It belongs to the bishopric of Worms, and the elector Palatine.

LADISLAUS, the name of several kings of Poland. See POLAND.

LADOGA, a town of the Russian empire, seated on a great lake of the same name, which has a communication with the gulph of Finland, by the river Nieva; and it abounds in fish, particularly salmon. E. Long. 33. 29. N. Lat. 60. 0.

LADOGNA, or LACEDOGNA, a town of Italy, in the kingdom of Naples, and in the Capitanata, with a bishop's see. E. Long. 15. 12. N. Lat. 41. 16.

LADRONE or MARIAN *Islands*, a cluster of 12 islands lying in the Pacific Ocean, in about 145° of east longitude, and between the 11th and 21st degree of north latitude. They were first discovered by Magellan, who sailed round the world through the Straits which bear his name. He gave them the name of *Ladrone Islands*, or the *Islands of Thieves*, from the thievish disposition of the inhabitants. At the time these islands were discovered by the Europeans, the natives were totally unacquainted with any other coun-

Ladrones. country besides their own; and having no traditional accounts of their own origin, they imagined that the author of their race was formed of a piece of the rock of Funa, one of their smallest islands. Many things looked upon by us as absolutely necessary to our existence, were utterly unknown to these people. They had no animals of any sort; and would not even have had any idea of them, had it not been for the birds; and even of them they had but one species, somewhat like the turtle-dove, which they never killed for eating, but only tamed them, and taught them to speak. They were much astonished on seeing a horse which a Spanish captain left among them in 1673, and could not for a long time be satisfied with admiring him. But what is most surprising and incredible in their history is, that they were utterly unacquainted with the element of fire, till Magellan, provoked by their repeated thefts, burned one of their villages. When they saw their wooden houses blazing, they first thought that the fire was a beast which fed upon the wood; and some of them who came too near, being burnt, the rest stood at a distance, lest they should be devoured or poisoned by the breathings of this terrible animal.

The inhabitants of the Ladrones are olive-coloured, but not of such a deep dye as those of the Philippine islands; their stature is good, and their limbs well proportioned. Though their food consists entirely of fish, fruits, and roots, yet they are so fat, that to strangers they appear swelled, but this does not render them less nimble and active. They often live to two years or more, yet retain the health and vigour of men of 50. The men go stark naked, but the women are covered. They are not ill-looking, and take great care of their beauty, though their ideas on that subject are very different from ours. They love black teeth and white hair. Hence one of their principal occupations is to keep their teeth black by the help of certain herbs, and to whiten their hair, sprinkling upon it a certain water for this purpose. The women have their hair very long; but the men generally shave it close, except a single lock on the crown of the head, after the manner of the Japanese. Their language much resembles that of the people called *Tagales* in the Philippine islands. It is agreeable to the ear, with a soft and easy pronunciation. One of its chief graces consists in the facility of transposing words, and even all the syllables of one word; and thus furnishing a variety of double meanings, with which these people are greatly delighted. Though plunged in the deepest ignorance, and destitute of every thing valued by the rest of mankind, no nation ever shewed more presumption, or a greater conceit of themselves than these islanders, looking on their own nation as the only wise, sensible, and polished one in the world, and beholding every other people with the greatest contempt. Though they are ignorant of the arts and sciences, yet, like every other nation, they have their fables which serve them for history, and some poems which they greatly admire. A poet is with them a character of the first eminence, and greatly respected.

We neither know at what time, nor from what place the Ladrone islands were first peopled. As Japan lies within six or seven days sail of them, some have been induced to believe, that the first inhabitants of the

Ladrones came from Japan. But from their greater resemblance to the inhabitants of the Philippine islands than to the Japanese, it is more probable that they came from the former than the latter. Formerly, most of the islands were inhabited; and about 90 years ago, the three principle islands, Guam, Tinian, and Rota, are said to have contained 50,000 people; but since that time, Tinian hath been entirely depopulated, and only 200 or 300 Indians left at Rota to cultivate rice for the island of Guam, which alone is inhabited by Europeans, and where the Spaniards have a governor and a garrison: here also the annual Manila ship touches for refreshments in her passage from Acapulco to the Philippines. The island of Tinian afforded an asylum to commodore Anson in 1742; and the masterly manner in which the author of that voyage paints the natural beauties of the country hath given a degree of estimation not only to this island, but to all the rest, which they had not before. Commodore Byron, in 1765, continued nine weeks at Tinian, and anchored in the very spot where the centurion lay; but gives a much less favourable account of this climate and country than the former navigator. The water, he says, is brackish, and full of worms: many of his men were seized with fevers, occasioned by the intense heat; the thermometer, which was kept on board the ship, generally stood at 86°, which is but 70 or 11 degrees less than the heat of the blood at the heart; and had the instrument been ashore, he imagines it would have stood much higher than it did. It was with the greatest difficulty that they could penetrate through the woods; and when they had fortunately killed a bull, and with prodigious labour dragged it through the forests to the beach, it stunk, and was full of fly-blows by the time it reached the shore. The poultry was ill-tasted; and within an hour after it was killed, the flesh became as green as grass, and swarmed with maggots. The wild hogs were very fierce; and so large, that a carcase frequently weighed 200 pounds. Cotton and indigo were found on the island. Captain Wallis continued here a month in 1767, but makes no such complaints.

LADY. This title is derived from two Saxon words, which signify *loaf-day*, which words have in time been contracted into the present appellation. It properly belongs only to the daughter of earls, and all of higher rank; but custom has made it a word of complaisance for the wives of knights, and of all eminent women.

As to the original application of this expression, it may be observed, that heretofore it was the fashion for those families, whom God had blessed with affluence, to live constantly at their mansion-houses in the country, and that once a-week, or oftener, the lady of the manor distributed to her poor neighbours, *with her own hands*, a certain quantity of bread; but the practice, which gave rise to this title, is now as little known as the meaning of it: however, it may be from that hospitable custom, that, to this day, the ladies in this kingdom alone serve the meat at their own tables.

LADY'S *Bedstraw*. See GALLIUM.

LADY'S *Mantle*. See ALCHEMILLA.

LADY'S *Smock*. See CARDAMINE.

LADY'S *Slipper*. See CYPRIPEDIUM.

Ladrones,  
Lady.

Laily

LADY'S Traces. See OPHRYS.

Lagoon.

LADY-Day, in law, the 25th of March, being the annunciation of the Holy Virgin. See ANNUNCIATION.

LÆLIUS (Caius), a Roman consul and great orator, surnamed the *Wise*, distinguished himself in Spain in the war against Viriathus the Spanish general. He is highly praised by Cicero, who gives an admirable description of the intimate friendship which subsisted between Lælius and Scipio Africanus the Younger. His eloquence, his modesty, and his abilities, acquired him a great reputation; and he is thought to have assisted Terence in his comedies. He died about 126 B. C.

LAER. See BAMBOCIO.

LAESTRYGONES, (anc. geog.), an ancient people dwelling in Sicily, together with the Cyclopes; about whose origin and fate Thucydides declares, he has nothing to say. They were also a people of Italy about Formia, of Scythian original, and a race of cannibals, (Pliny); resembling giants rather than men, (Homer).

LAET (John de), a writer in the 17th century, born at Antwerp, was director of the West India company. He acquired great skill in the languages, in history, and geography; and had the management of Elzevir's edition of *A description of most kingdoms in the world*, printed in Latin. He wrote, in French, a *Description of the East Indies*, and other works; and died in 1649.

LÆVINUS (Torrentinus), commonly called *Vander Beek*, or *Torrentin*, was a native of Ghent, and bred in the university of Louvain. He afterwards made the tour of Italy, where his virtues obtained him the friendship of the most illustrious personages of his time. On his return to the Low Countries; he was made canon of Liege, and vicar-general to Ernest de Baviere, bishop of that see. At length, having executed a successful embassy to Philip II. of Spain, he was rewarded with the bishopric of Antwerp; from whence he was translated to the metropolitan church of Mechlin, and died there in 1595. He founded a college of Jesuits at Louvain, to which he left his library, medals, and curiosities. He wrote several poems that procured him the character of being, after Horace, the prince of the lyric poets.

LÆVIUS, a Latin poet. It is not well known when he lived, but probably he was more ancient than Cicero. He made a poem entitled *Erotopagnia*, i. e. *love-games*. Aulus Gellius quotes two lines of it. Apuleius also quotes six lines from the same poet, but he does not tell from what work he borrowed them. Lævius had also composed a poem intitled *The centaurs*, which Festus quotes under the title of *Petrarum*.

LAGAN, or LAGON. See FLOTSOM.

LAGNY, a town of the ile de France, with a famous benedictine abbey. It is seated on the river Marne, in E. Long. 2. 45. N. Lat. 48. 50.

LAGOON ISLAND, one of the new discovered islands in the South Sea, lying in S. Lat. 18. 47. W. Long. 139. 28. It is of an oval form, with a lake in the middle, which occupies much the greatest part of it. The whole island is covered with trees of different growth. It is inhabited by a race of Indians, tall, of

a copper-colour, with long black hair. Their weapons are poles or spikes, which are twice as long as themselves. Their habitations were seen under some clumps of palm-trees, which formed very beautiful groves. This island was discovered by Captain Cook in April 1769.

LAGOPUS, in ornithology. See TETRAO.

LAGOS, a sea-port town of Portugal, in the kingdom of Algarve, with a castle near the sea, where there is a good harbour, and where the English fleets bound to the Straits usually take in fresh water. W. Long. 8. 5. N. Lat. 36. 45.

LAGUNA, or *San Christoval de Laguna*, a considerable town in the island of Teneriff, near a lake of the same name, on the declivity of a hill. It has very handsome buildings, and a fine square. W. Long. 16. 24. N. Lat. 28. 30.

LAGUNES OF Venice, are marshes or lakes in Italy on which Venice is seated. They communicate with the sea, and are the security of the city. There are about 60 islands in these Lagunes, which together make a bishop's see. Murano is the most considerable, next to those on which Venice stands.

LAHOLM, a sea-port town of Sweden, in the province of Gothland, and territory of Halland, seated near the Baltic Sea, with a castle and a harbour, in E. Long. 13. 13. N. Lat. 56. 35.

LAHOR, a large town of Asia, in Indostan, and capital of a province of the same name, and one of the most considerable in the Mogul's dominions. It is of a vast circumference, and contains a great number of mosques, public baths, caravanseras, and pagods. It was the residence of the Great Mogul; but since the removal of the court, the fine palace is going to decay. There is a magnificent walk of shady trees, which runs from this to Agra, that is upwards of 300 miles. Here they have manufactures of cotton-cloths and stuffs of all kinds, and they make very curious carpets. E. Long. 75. 55. N. Lat. 31. 40.

LAINEZ (James), a Spaniard, companion of Ignatius of Loyola, second general of the Jesuits, and a man of a more daring and political character. Having procured from pope Paul IV. the perpetual generalship of the new order of Jesuits, after the death of Ignatius, he got the following privileges ratified by that pontiff, which shew, that he was in fact the founder of the worst part of their institution: 1. The right of making all sorts of contracts (without the privacy of the community) vested in the generals and their delegates. 2. That of giving authenticity to all comments and explanations of their constitutions. 3. The power of making new, and altering the old: this opened the door to their bloody political tenets, not to be attributed to Loyola. 4. That of having prisons independent of the secular authority, in which they put to death refractory brethren. Lainez died in 1565, aged 53.

LAIRESSE (Gerard), an eminent Flemish painter, born at Liege in 1640. He received the principal part of his instruction from his father Reiniere de Lairesse, though he is also accounted a disciple of Bartolet. He first settled at Utrecht, where he lived in distressed circumstances; but an accidental recommendation carrying him to Amsterdam, he soon exchanged want and obscurity for affluence and reputation.



Laity,  
Lake.

tion. He was a perfect mastery of history; his designs are distinguished by the grandeur of the composition; and the back-grounds, wherever the subjects required it, are rich in architecture, which is an uncommon circumstance in that country. He had the unhappiness to lose his sight several years before his death, which happened in 1711; so that the treatise on design and colouring, which passes under his name, was not wrote by him, but collected from his observations after he was blind, and published after his death. He had three sons, two of whom were painters; and also three brothers, Ernest, James, and John: Ernest and John painted animals, and James was a flower-painter. He engraved a good deal in aquafortis: his works consist of 256 plates, above half of which were done with his own hand. He wrote an excellent book on the art, which has been translated into English, and printed at London both in 4to and 8vo.

LAITY, the people as distinguished from the clergy; (see CLERGY). The lay part of his Majesty's subjects is divided into three distinct states; the civil, the military, and the maritime. See CIVIL, MILITARY, MARITIME.

LAKE, a collection of waters contained in some cavity in an inland place, of a large extent, surrounded with land, and having no communication with the ocean. Lakes may be divided into four kinds. 1. Such as neither receive nor send forth rivers. 2. Such as emit rivers, without receiving any. 3. Such as receive rivers, without emitting any. And, 4. Such as both receive and send forth rivers. Of the first kind, some are temporary and others perennial. Most of those that are temporary owe their origin to the rain, and the cavity or depression of the place in which they are lodged: thus in India there are several such lakes made by the industry of the natives, of which some are a mile, and some two in circuit; these are surrounded with a stone-wall, and being filled in the rainy months, supply the inhabitants in dry seasons, who live at a great distance from springs or rivers. There are also several of this kind formed by the inundations of the Nile and the Niger; and in Muscovy, Finland, and Lapland, there are many lakes formed, partly by the rains, and partly by the melting of the ice and snow: but most of the perennial lakes, which neither receive nor emit rivers, probably owe their rise to springs at the bottom, by which they are constantly supplied. The second kind of lakes, which emit without receiving rivers, is very numerous. Many rivers flow from these as out of cisterns; where their springs being situated low within a hollow place, first fill the cavity and make it a lake, which not being capacious enough to hold all the water, it overflows and forms a river: of this kind is the Wolga, at the head of the river Wolga; the lake Odium, at the head of the Tanais; the Adæ, from whence one branch of the river Tigris flows; the Ozero, or White lake, in Muscovy, is the source of the river Shakma. The great lake Chaamay, which emits four very large rivers, which water the countries of Siam, Pegu, &c. viz. the Menan, the Asa, the Caipoumo, and the Laquia, &c. The third species of lakes, which receive rivers but emit none, apparently owe their origin to those rivers which, in their progress from their source, fall into some extensive cavity, are collected together,

and form a lake of such dimensions as may lose as much by exhalation as it continually receives from these sources: of this kind is that great lake improperly called the *Caspian Sea*; the lake Asphaltites, also called the *Dead Sea*; the lake of Geneva, and several others. Of the fourth species, which both receive and emit rivers, we reckon three kinds, as the quantity they emit is greater, equal, or less than they receive. If it be greater, it is plain that they must be supplied by springs at the bottom; if less, the surplus of the water is probably spent in exhalations; and if it be equal, their springs just supply what is evaporated by the sun.

Lakes are also divided into those of fresh water, and those of salt. Dr Halley is of opinion, that all great perennial lakes are saline, either in a greater or less degree; and that this saltness increases with time: and on this foundation he proposes a method for determining the age of the world.

Large lakes answer the most valuable purposes in the northern regions, the warm vapours that arise from them moderating the pinching cold of those climates; and what is still a greater advantage, when they are placed in warmer climates at a great distance from the sea, the exhalations raised from them by the sun cause the countries that border upon them to be refreshed with frequent showers, and consequently prevent their being barren deserts.

LAMA, a fynonime of the camelus pacos. See CAMELUS.

LAMA, the sovereign pontiff, or rather god, of the Asiatic Tartars, inhabiting the country of Barantola. The lama is not only adored by the inhabitants of the country, but also by the kings of Tartary, who send him rich presents, and go in pilgrimage to pay him adoration, calling him *lama congiu*, i. e. god, the everlasting father of heaven. He is never to be seen but in a secret place of his palace, amidst a great number of lamps, sitting cross-legged upon a cushion, and adorned all over with gold and precious stones; where, at a distance, they prostrate themselves before him, it not being lawful for any to kiss even his feet. He is called the *great lama*, or *lama of lamas*, that is, *priest of priests*. And to persuade the people that he is immortal, the inferior priests, when he dies, substitute another in his stead, and so continue the cheat from generation to generation. These priests persuade the people, that the lama was raised from death many hundred years ago, that he has lived ever since, and will continue to live for ever.

LAMB, in zoology, the young of the sheep-kind. See OVIS.

A male lamb of the first year is called a *wedder-hog*, and the female a *ewe-hog*; the second year it is called a *wedder*, and the female a *sheave*. If a lamb be sick, mare's milk with water may be given it; and by blowing into the mouth, many have been recovered, after appearing dead. The best season for weaning them is when they are 16 or 18 weeks old, and about Michaelmas. The males should be separated from the females, and such males as are not designed for rams, gelded. "Lamb, (says Dr Cullen), appears a more fibrous kind of meat, and upon that account is less easily soluble than veal. In Scotland, house-lamb is never reared to advantage."

Lama,  
Lamb.



Lamb  
|  
Lambert.

Lambert  
|  
Lamentations.

*Scythian* LAMB, a kind of moss, which grows about the roots of fern in some of the northern parts of Europe and Asia, and sometimes assumes the form of a quadruped. See Plate CLVIII. fig. 8. A particular description of it may be seen in Philof. Transf. N<sup>o</sup> 398.

LAMBECIUS (Peter), born at Hamburg in 1628, was one of the most learned men of his time. He went very young to study in foreign countries, at the expense of his uncle the learned Holstenius. He was chosen professor of history at Hamburg in 1652, and rector of the college of that city in 1660. He had taken his degree of doctor of law in France before. He suffered a thousand vexations in his own country; because his enemies charged him with atheism, and censured his writings bitterly. He married a rich lady, but who was so very covetous, that he left her in disgust within a fortnight. He went to Vienna, and from thence to Rome, where he publicly professed the Catholic religion. He returned to Vienna in 1662, where he was kindly received by the emperor, who appointed him his library-keeper, and afterwards his principal librarian, with the title of *counsellor and historiographer*; in which employment he continued till his death, and gained a great reputation by the works he published, viz. 1. *An Essay on Aulus Gellius*. 2. *The Antiquities of Hamburg*. 3. *Remarks on Codinus's Antiquities of Constantinople*, &c.

LAMBERT of Alchaffenburg, a Benedictine monk, in the 11th century, wrote several works; among which is a history of Germany, from the year 1050 to 1077, which is esteemed.

LAMBERT (John), general of the parliament's forces in the civil wars of the last century, was of a good family, and for some time studied the law in one of the inns of court; but upon the breaking out of the rebellion, went into the parliament-army, where he soon rose to the rank of colonel, and by his conduct and valour performed many eminent services. But when Cromwell seemed inclined to assume the title of king, Lambert opposed it with great vigour, and even refused to take the oath required by the assembly and council to be faithful to the government; on which Cromwell deprived him of his commission, but granted him a pension of 2000 l. a-year. This was an act of prudence rather than of generosity; as he well knew, that such a genius as Lambert's, rendered desperate by poverty, was capable of attempting any thing.

Lambert being now divested of all employment, retired to Wimbleton-house; where turning florist, he had the finest tulips and gilliflowers that could be got for love or money. Yet amidst these amusements he still nourished his ambition: for when Richard Cromwell succeeded his father, he acted so effectually with Fleetwood, Desborough, Vane, Berry, and others, that the new protector was obliged to surrender his authority; and the members of the long-parliament, who had continued sitting till the 20th of April 1653, when Oliver dismissed them, were restored to their seats, and Lambert was immediately appointed one of the council of state, and colonel of a regiment of horse and another of foot. For this service the parliament presented him 1000 l. to buy a jewel; but he distributed it among his officers. This being soon known to the parliament, they concluded that he intended to secure a party in the army. They therefore

courteously invited him to come to London; but resolved, as soon as he should arrive, to secure him from doing any farther harm. Lambert, apprehensive of this, delayed his return, and even refused to resign his commission when it was demanded of him and of eight of the other leading officers; and, marching up to London with his army, dislodged the parliament by force in October 1659. He was then appointed, by a council of the officers, major-general of the army, and one of the new council for the management of public affairs, and sent to command the forces in the north. But general Monk marching from Scotland into England to support the parliament, against which Lambert had acted with such violence, the latter, being deserted by his army, was obliged to submit to the parliament, and by their order was committed prisoner to the tower; where escaping, he soon appeared in arms with four troops under his command, but was defeated and taken prisoner by colonel Ingoldby.

At the Restoration he was particularly excepted out of the act of indemnity. Being brought to his trial on the 4th of June 1662, for levying war against the king, this daring general behaved with more submission than the meanest of his fellow-prisoners, and was by his majesty's favour reprieved at the bar, and confined during his life in the island of Guernsey.

LAMBERT (Anna Theresia de Marguenat de Courcelles, marchioness of), an elegant moral writer, was the only daughter of Stephen Marguenat lord of Courcelles. In 1666 she married Henry de Lambert, who at his death was lieutenant-general of the army; and she afterwards remained a widow with a son and a daughter, whom she educated with great care. Her house was a kind of academy, to which persons of distinguished abilities regularly resorted. She died at Paris in 1733, aged 86. Her works, which are written with much taste, judgement, and delicacy, are printed in two volumes. The advice of a mother to her son and daughter are particularly esteemed.

LAMBIN (Dennis), an eminent classical commentator, was born at Montreuil-sur-Mer, in Picardy, and acquired great skill in polite literature. He lived for a long time at Rome; and at his return to Paris was made royal professor of the Greek language. He died in 1572, aged 56, of pure grief at the death of his friend Ramus, who was murdered at the massacre on St Bartholomew's day. He wrote commentaries on Plautus, Lucretius, Cicero, and Horace, and other works. His commentary on Horace is more particularly esteemed.

LAMELLÆ, in natural history, denotes very thin plates, such as the scales of fishes are composed of.

LAMENTATIONS, a canonical book of the Old Testament, written by the prophet Jeremiah. The two first chapters of this book are employed in describing the calamities of the siege of Jerusalem. In the third, the author deploras the persecutions he himself had suffered. The fourth turns upon the desolation of the city and temple, and the misfortune of Zedekiah. The fifth chapter is a prayer for the Jews in their dispersion and captivity; and, at the end of all, he speaks of the cruelty of the Edomites, who had insulted Jerusalem in her misery. The first four chapters of the Lamentations are an abecedar, every verse or couplet beginning with one of the letters of the He-

Lamie  
 Lamp.

brew alphabet, in the alphabetical order.

LAMIE, *Lamie*, among the ancients, a kind of dæmons, or evil spirits, who, under the form of beautiful women, are said to have devoured children.

Horace makes mention of them in his Art of Poetry. Some authors call them *lamie*, à *laniando*. Philostratus says, they are also called *larvæ*, or *lemures*, as if they were all the same thing. Borchart will have the word to be *Phœnician*, and derives it from פֶּנִּי "to devour;" alleging the fable of the lamie came from Libya.

LAMINÆ, in physiology, thin plates, or tables, whereof any thing consists; particularly the human skull, which are two, the one laid over the other.

LAMIUM, *Dead-Nettle*; a genus of the gymnospermia order, belonging to the didynamia class of plants. There are eight species; of which only two, viz. the album, white archangel, or dead-nettle, and the purpureum or red archangel, are remarkable; and that only because their young leaves are boiled and eaten in some places like greens. The first grows frequently under hedges and in waste places; the second is very common in gardens and corn-fields. None of the species are cultivated except merely for the sake of variety.

LAMMAS DAY, the first of August; so called, as some will have it, because lambs then grow out of season, as being too big. Others derive it from a Saxon word, signifying "loaf-mass," because on that day our fore-fathers made an offering of bread made with new wheat.

On this day the tenants who formerly held lands of the cathedral church in York, were bound by their tenure to bring a lamb alive into the church at high-mass.

LA MOIGNON (Chretien Francis de) marquis of Baviile, and president of the parliament of Paris, was born in 1644. His father would not trust the education of his son to another, but took it upon himself, and entered into the minutest particulars of his first studies: the love of letters and a solid taste were the fruits the scholar reaped from this valuable education. He learned rhetoric in the Jesuits college, made the tour of England and Holland, and returned home the admiration of those meetings regularly held by persons of the first merit, at his father's house. The several branches of literature were however only his amusement: the law was his real employ; and the eloquence of the bar at Paris owes its reformation from bombast and affected erudition, to the plain and noble pleadings of M. Lamoignon. He was appointed the king's advocate general in 1673; which he discharged until 1698, when the presidentship of the parliament was conferred on him. This post he held nine years, when he was allowed to resign in favour of his eldest son: he was chosen president of the royal academy of inscriptions in 1705. The only work he suffered to see the light was his *Pleader*, which is a monument of his eloquence and inclination to polite letters. He died in 1709.

LAMP, a vessel containing oil, with a lighted wick.

Dr St Clair, in the *Philos. Trans.* n° 245, gives the description of an improvement on the common lamp. He proposes that it should be made two or three inches deep, with a pipe coming from the bottom almost as

high as the top of the vessel. Let it be filled so high with water, that it may cover the hole of the pipe at the bottom, that the oil may not get in at the pipe and so be lost. Then let the oil be poured in, so as to fill the vessel almost brim-full; and to the vessel must be adapted a cover having as many holes as there are to be wicks. When the vessel is filled and the wicks lighted, if water falls in by drops at the pipe, it will always keep the oil at the same height or very near it; the weight of the water being to that of the oil as 20 $\frac{1}{2}$  to 19, which in two or three inches makes no great difference. If the water runs faster than the oil wastes, it will only run over at the top of the pipe, and what does not run over will come under the oil, and keep it at the same height.

From experiments made in order to ascertain the expence of burning chamber-oil in lamps, it appears, that a taper-lamp, with eight threads of cotton in the wick, consumes in one hour  $1\frac{1}{2}$  oz. of spermaceti oil, at 2s. 6d. per gallon; so that the expence of burning 12 hours is 4.57 farthings. This lamp gives as good a light as the candles of eight and ten in the pound; it seldom wants snuffing, and casts a strong and steady light. A taper, chamber, or watch lamp, with four ordinary threads of cotton in the wick, consumes 0.1664 oz. of spermaceti oil in one hour; the oil at 2s. 6d. per gallon, makes the expence of burning 12 hours only 2.34 farthings.

*Perpetual LAMPS.* The testimonies of Pliny, St Austin, and others, have led many to believe that the ancients had the invention of perpetual lamps; and some moderns have attempted to find out the secret, but hitherto in vain. Indeed it seems no easy matter to find out either a perpetual wick, or a perpetual oil. The curious may read Dr Plot's conjectures on the subject in the *Philos. Trans.* n° 166; or in Lowthorp's abridgement, vol. iii. p. 636. But few, we believe, will give themselves the trouble of searching for the secret, when they consider, that the credulity of Pliny and of St Austin was such, that their testimony does not seem a sufficient inducement to us to believe that a lamp was ever formed to burn 1500 or 1000 years: much less is it credible that the ancients had the secret of making one burn for ever.

*Rolling-LAMP*, a machine AB, with two moveable circles DE, FG, within it; whose common centre of motion and gravity is at K, where their axis of motion cross one another. If the lamp KC, made pretty heavy and moveable about its axis HI, and whose centre of gravity is at C, be fitted within the inner circle, the common centre of gravity of the whole machine will fall between K and C; and by reason of the pivots A, B, D, E, H, I, will be always at liberty to descend: hence, though the whole machine be rolled along the ground, or moved in any manner, the flame will always be uppermost, and the oil cannot spill.

It is in this manner they hang the compass at sea; and thus should all the moon-lanterns be made, that are carried before coaches, chaises, and the like.

LAMP-Black, among colourmen. See COLOUR-Making, n° 17, 18.—Substances painted with lamp-black and oil, are found to resist the effects of electricity to a surprising degree; so that in many cases even lightning itself seems to have been repelled by them. See LIGHTNING; THUNDER; CHEMISTRY, n° 112. and ELEC-

Lamp.

Lampadary ELECTRICITY, n° 112.

LAMPADARY, an officer in the ancient church of Constantinople, so called from his employment, which was to take care of the lamps, and to carry a taper before the emperor or patriarch when they went to church or in procession.

LAMPAS, in farrery. See there, § xxiv.

LAMPREY. See PETROMYZON.

LAMPRIIDIUS (Ælius), a Latin historian, who lived under the emperors Dioclesian and Constantine the Great. We have, of his writing, the lives of four emperors, Antoninus, Commodus, Diadumenus, and Heliogabalus. Some attribute the life of Alexander Severus to him; but the MS in the palatine library ascribes it to Spartian.

LAMPRIIDIUS (Benedict), of Cremona, a celebrated Latin poet of the 16th century. He taught Greek and Latin at Rome and at Padua, until he was invited to Mantua by Frederic Gonzaga to undertake the tuition of his son. We have epigrams and lyric verses of this writer, both in Greek and Latin, which were printed separately, as well as among the *Delicia* of the Italian poets.

LAMPASACUS, LAMPASACUM, (anc. geog.) a considerable city of Mysia; more anciently called *Pityea*, (Homer), because abounding in pine-trees, a circumstance confirmed by Pliny; situate at the north end, or entrance of the Hellespont, into the Propontis, with a commodious harbour, opposite to Callipolis in the Thracian Chersonesus. It was assigned by Artaxerxes to Themistocles, for furnishing his table with wine, in which the country abounded. It was saved from the ruin threatened by Alexander because in the interest of Persia, by the address of Anaximenes the historian, sent by his fellow-citizens to avert the king's displeasure; who hearing of it, solemnly declared he would do the very reverse of Anaximenes's request, who therefore begged the king utterly to destroy it, which he could not do because of his oath. *Lampascius* the epithet, denoting *lascivus*, the character of the people: still called *Lampascus*. E. Long. 28°. N. Lat. 40. 12.

LAMY, or LAMI, (Bernard), was born at Mons in 1640, and studied there under the fathers of the oratory; with whose way of life he was so pleased, that he went to Paris in 1658, and entered into the institution. He had a great taste for the sciences, and studied them all; he entered into the priesthood in 1667, and taught philosophy at Saumur and Angiers; which latter place he was obliged to quit by an order procured from court for adopting the new philosophy instead of that of Aristotle. In 1676, he went to Grenoble, where cardinal Camus was then bishop; who conceived such an esteem for him, that he retained him near his person, and derived considerable services from him in the government of his diocese. After continuing many years there, he went to reside at Rouen, where he died in 1715. He wrote several scientific works, besides others in divinity.

LANCARIM SPRING, the name of a medicated water of Glamorganshire. It has its name from a town near which it rises; and has been very long famous in the place for the cure of the king's evil. The body of water is about an ell broad, and runs between two hills covered with wood. About 12 yards from this spring the rill falls from a rock of about eight or nine feet

high, with a considerable noise. The spring is very Lancashire, clear, and rises out of a pure white marle. The cures that have been performed there, are proofs of a real power in the water; but there is some question whether the water, or its motion and coldness, does the good; for the people who come for relief always drink of the spring, and bathe the part afterward in the fall below. It is generally supposed, that the limestone rocks communicate a virtue to it by which it cures internally; but it has been often found, that the holding a limb disordered with the evil in the strong current of a mill-tail has cured it, and there is the same advantage in the fall of this water.

LANCASHIRE, a large maritime province of England, washed by the Irish sea on the west, bordering on the north with part of Cumberland and Westmoreland; bounded on the east by the West Riding of Yorkshire, and on the west by Cheshire; extending 45 miles in length from north to south, and 32 miles in breadth from east to west; comprehending six hundreds, 60 parishes, 27 market-towns, and about 240000 inhabitants.

The eastern parts of the province are rocky, and in the northern districts we see many single mountains remarkably high, such as Ingleborough-hill, Cloughbo-hill, Pendle-hill, and Longridge-hill. Nor is there any want of wood in this country, either for timber or fuel; witness Wierdale forest and Bowland forest to the northward, and Simon's wood in the southern part of Lancashire.

This country is well watered with rivers and lakes. Among the former we number the Mersey, the Ribble, the Wier, the Lon, the Ken, and the Irke. The Mersey springs among the mountains of Derbyshire, is swelled by several streams, winds along the borders of Lancashire, which it divides from Cheshire, and runs into the sea at Liverpool. The Ribble, rising in Yorkshire, enters this county at Clithero, washes the town of Preston, and having received the smaller streams of the Hadder, the Whalley, the Darwent, and the Lea, disembogues itself into the Irish sea at Lethum. The Wier is a continuation of the Calder, which derives its source from the forest of Wierdale, in the northern part of the county, and, being augmented by divers smaller streams, runs into the sea at Cockerham. The Irke is an inconsiderable rivulet, that forms the beginning of the Irwel and Mersey, which are its continuations; and is noted for producing the fattest eels in England.

Among the lakes or meres of Lancashire, we reckon the Winander-mere, and the Kenington-mere, which, tho' neither so large nor so well stored with fish, yet affords plenty of excellent char. There was on the south side of the Ribble another lake called *Marton*, several miles in circumference, which is now drained, and converted into pasture-ground. In this operation, the workmen found a great quantity of fish, together with eight canoes, resembling those of America, supposed to have been used by the ancient British fishermen. Besides these meres or lakes, this county abounds with morasses and mosses, from which the inhabitants dig excellent peat or turf for fuel, as well as marle for manuring the ground, and trunks of old fir-trees, supposed to have lain there since the general deluge. Some of these are so impregnated with turpentine, that, when divided into



*Lancashire.* to splinters, they burn like candles, and are used for that purpose by the common people. There is a great variety of mineral waters in this county, some periodical springs, and one instance of a violent eruption of water at Kirky in Founells. The most remarkable chalybeate spaws are those of Latham, Wigan, Stockport, Burnley, Bolton, Plumpton, Middleton, Strangeways, Lancaster, Larbrick, and Chorley. At Ancliff, in the neighbourhood of Wigan, is a fountain called the *Burning Well*, from whence a bituminous vapour exhales, which being set on fire by a candle burns like brandy, so as to produce a heat that will boil eggs to a hard confluence, while the water itself retains its original coldness\*. There is at Barton a fountain of salt-water, so strongly impregnated with the mineral, as to yield six times as much as can be extracted from the same quantity of sea-water. At Rogham, in Founells, there is a purging saline fountain; and in the neighbourhood of Ruffal, where the ground is frequently overflowed by the sea, a stream descends from Haggar-hills, which, in the space of seven years, is said to convert the marle into a hard freestone fit for building. The air of Lancashire is pure, healthy, and agreeable, except among the fens and on the sea-shore, where the atmosphere is loaded with putrid exhalations producing malignant and intermitting fevers, scurvy, rheumatism, dropsy, and consumption. The soil is various in different parts of the county, poor and rocky on the hills, fat and fertile in the valleys and champaign country. The colour of the peat is white, grey, or black, according to the nature of the composition and the degree of putrefaction which the ingredients have undergone. There is a bituminous earth about Ormirkirk, that smells like the oil of amber, and indeed yields an oil of the same nature, both in its scent and medicinal effects, which moreover reduces raw flesh to the confluence of mummy: this earth burns like a torch, and is used as such by the country people. The metals and minerals of this county consist of lead, iron, copper, antimony, black lead, lapis calaminaris, spar, green vitriol, allum, sulphur, pyrites, freestone, and pit and cannel coal.

\* See  
BURNING  
Well.

The level country produces plenty of wheat and barley, and the skirts of the hills yield good harvests of excellent oats: very good hemp is raised in divers parts of the province; and the pasture which grows in the valley is so peculiarly rich, that the cattle which feed upon it are much larger and fatter than in any other part of England. There is not any part of the world better supplied than Lancashire with provisions of all kinds at a very reasonable rate; such as beef, veal, mutton, lamb, pork, poultry, and game of all sorts, caught upon the moors, heaths, and commons, in the lilly part of the shire. Besides the sea-fowl common to the shires of England, such as ducks, easlerlings, teal, and plover, many uncommon birds are observed on the coast of Lancashire, the sea-crow, variegated with blue and black, the puffin, the cormorant, the curlew, the razor-bill, the copped wren, the red-thanks, the swan, the tropic bird, the king's-fisher, &c.

Lancashire was erected into a county-palatine by Edward III. who conferred it as an appenage on his son John of Ghaunt, thence called *duke of Lancaster*: but the duchy contained lands that are not in Lanca-

shire, and, among other demesnes, the palace of the Savoy, and all that district in London, which indeed belong to it at this day. The revenues of this duchy are administered by a court which sits at Westminster, and a chancery-court at Preston, which has a seal distinct from that of the county-palatine. The title of *Lancaster* distinguished the posterity of John of Ghaunt from those of his brother, who succeeded to the duchy of York, in their long and bloody contest for the crown of England.—Lancashire sends two members to parliament for the county; and 12 for the six boroughs of Lancaster, Preston, Newton, Wigan, Clithero, and Liverpool.

LANCASTER, the capital of the county of Lancashire in England, is pleasantly situated on the south side of the river Lun, over which there is a handsome stone-bridge supported by five arches. It is an ancient town, and is supposed to have been the *Longovicium* of the Romans. It contains several good streets with well-built houses; but has only one parish-church, which is large and handsome, and is seated on the side of a high hill, on the top of which stands the castle that is now made use of as a prison. It is a place of no great trade, but is a corporation, and sends two members to parliament. The chief ornaments of the town are the church, castle, bridge, and town-hall. W. Long. 2. 44. N. Lat. 54. 5.

LANCE, in ichthyology. See AMMODYTES.

LANCEOLATED LEAF. See BOTANY, p. 1296.

LANCET, a chirurgial instrument, sharp-pointed and two-edged, chiefly used for opening veins in the operation of phlebotomy or bleeding; also for laying open abscesses, tumours, &c.

LANCH, a peculiar sort of long boat, used by the French, Spanish, and Italian shipping, and in general by those of other European nations, when employed in voyaging in the Mediterranean sea.

A launch is proportionally longer, lower, and more flat-bottomed than the long-boat; it is by consequence less fit for sailing, but better calculated for rowing and approaching a flat shore. Its principal superiority to the long-boat, however, consists in being, by its construction, much fitter to under-run the cable; which is a very necessary employment in the harbours of the Levant sea, where the cables of different ships are fastened across each other, and frequently render this exercise extremely necessary.

LANCH, is also the movement by which a ship or boat descends from the shore, either when she is at risk built, or at any time afterwards.

To facilitate the operation of lanching, and prevent any interruption therein, the ship is supported by two strong platforms, laid with a gradual inclination to the water, on the opposite sides of her keel, to which they are parallel. Upon the surface of this declivity are placed two corresponding ranges of planks, which compose the base of a frame called the *cradle*, whose upper-part envelopes the ship's bottom, whereto it is securely attached. Thus the lower surface of the cradle, conforming exactly to that of the frame below, lies flat upon it, lengthways, under the opposite sides of the ship's bottom; and as the former is intended to slide downwards upon the latter, carrying the ship along with it, the planes or faces of both are well daubed with soap and tallow.

Lancaster  
Lanch.



Lancerota  
||  
Lancifi.

The necessary preparations for the lanch being made, all the blocks and wedges, by which the ship was formerly supported, are driven out from under her keel, till her whole weight gradually subsides upon the platforms above described, which are accordingly called the *ways*. The shores and stanchions, by which she is retained upon the rocks till the period approaches for lanching, are at length cut away, and the screws applied to move her, if necessary. The motion usually begins on the instant when the shores are cut, and the ship slides downward along the ways, which are generally prolonged under the surface of the water, to a sufficient depth to float her as soon as she arrives at the farthest end thereof.

When a ship is to be lanch'd, the ensign, jack, and pendant, are always hoisted, the last being displayed from a staff erected in the middle of the ship.

Ships of the first rate are commonly constructed in dry docks, and afterwards floated out, by throwing open the float-gates, and suffering the tide to enter, as soon as they are finished.

LANCEROTA, one of the Canary islands, subject to Spain, and situated in W. Long. 13. 5. N. Lat. 28. 40. It is about 32 miles in length and 22 in breadth. The ancient inhabitants were negroes, very strong, active, and swift of foot. There is a ridge of hills runs quite through it, on which are fed a good number of sheep and goats. They have but few black cattle, still fewer camels, and a very few small horses. The valleys are dry and sandy, yet they produce a small quantity of wheat and barley. This island was first discovered in 1417. In 1596, it was taken by the English under the command of the earl of Cumberland; after which it was better fortified than before. There is in this island a city called also *Lancerota*, which, at the time the earl of Cumberland was there, consisted only of about 100 houses, all poor buildings, generally of one story, and covered with reeds or straw laid upon a few rafters, and over all a coat of dirt hardened by the sun. There was also a church which had no windows in it, and was supplied with light only by the door.

LANCIANO, a considerable town of Italy, in the kingdom of Naples, and in the Hither Abruzzo, with an archbishop's see; famous for its fairs which are held in July and August. It is seated on the river Feltrino near that of Sangor. E. Long. 15. 5. N. Lat. 42. 12.

LANCISI (John Marca), an eminent Italian physician, was born at Rome in 1654. From his earliest years he had a turn to natural history; and studied botany, chemistry, anatomy, and medicine, with great vigour. In 1688, Pope Innocent XI. appointed him his physician and private chamberlain, notwithstanding his youth; and cardinal Altieri Camerlinga made him his vicar for the installation of doctors in physic, which Pope Clement XI. gave him as long as he lived, as well as continued to him the appointments conferred on him by his predecessor. He died in 1720, after giving his fine library of more than 20,000 volumes to the hospital of the Holy Ghost, for the use of the public. This noble benefaction was opened in 1716, in the presence of the pope and most of the cardinals. He wrote many works which are esteemed the principal of which were collected toge-

ther, and printed at Geneva in 1718, in two volumes quarto.

LANCRET (Nicholas), a French painter born at Paris in 1690. He was the disciple of Watteau and Gillot, and painted conversations. He was indefatigable in his profession, executed with great truth after Nature, grouped his figures well, and handled a light pencil. He died in 1743.

LANCRINCK (Proper Henry), a painter of considerable note, born in 1628, and educated in the school at Antwerp. He studied principally after Titian and Salvator Rosa; and met with encouragement in England suitable to his merit. His landscapes shew a good invention, good colouring and harmony: they are chiefly of rough rude country, with broken ground and uncommon scenery. He gave way too much to pleasure, and died in 1692.

LAND, in a general sense, denotes *terra firma*, as distinguished from *sea*.

LAND, in a limited sense, denotes arable ground. See AGRICULTURE.

LAND, in the sea-language, makes part of several compound terms; thus, *land-laid*, or, *to lay the land*, is just to lose sight of it. *Land-locked*, is when land lies all round the ship, so that no point of the compass is open to the sea. If she is at anchor in such a place, she is said to ride *land-locked*, and is therefore concluded to ride safe from the violence of the winds and tides. *Land-mark*, any mountain, rock, steeple, tree, &c. that may serve to make the land known at sea. *Land is shut in*, a term used to signify that another point of land hinders the sight of that from which the ship came. *Land-to*, or the ship *lies land-to*; that is, she is so far from shore, that it can only just be discerned. *Land-turn* is a wind that in almost all hot countries blows at certain times from the shore in the night. *To fet the land*; that is, to see by the compass how it bears.

LAND-TAX, one of the annual taxes raised upon the subject. See TAX.

The land-tax, in its modern shape, has superseded all the former methods of rating either property, or persons in respect of their property, whether by tenths or fifteenths, subsidies on land, hydages, scutages, or talliages; a short explication of which will, however, greatly assist us in understanding our ancient laws and history.

Tenths, and fifteenths, were temporary aids issuing out of personal property, and granted to the king by parliament. They were formerly the real tenth or fifteenth part of all the moveables belonging to the subject; when such moveables, or personal estates, were a very different and a much less considerable thing than what they usually are at this day. Tenths are said to have been first granted under Henry II. who took advantage of the fashionable zeal for croisades to introduce this new taxation, in order to defray the expence of a pious expedition to Palestine, which he really or seemingly had projected against Saladin emperor of the Saracens, whence it was originally denominated the *Saladine tenth*. But afterwards fifteenths were more usually granted than tenths. Originally the amount of these taxes was uncertain, being levied by assessments new-made at every fresh grant of the commons, a commission for which is preserved.

Lancet  
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Land.

served by Matthew Paris: but it was at length reduced to a certainty in the eighth year of Edward III. when, by virtue of the king's commission, new taxations were made of every township, borough, and city in the kingdom, and recorded in the exchequer; which rate was, at the time, the fifteenth part of the value of every township, the whole amounting to about 29000 l. and therefore it fill kept up the name of a *fifteenth*, when, by the alteration of the value of money and the increase of personal property, things came to be in a very different situation. So that when, of later years, the commons granted the king a *fifteenth*, every parish in England immediately knew their proportion of it; that is, the same identical sum that was assessed by the same aid in the eighth of Edward III.; and then raised it by a rate among themselves, and returned it into the royal exchequer.

The other ancient levies were in the nature of a modern land-tax: for we may trace up the original of that charge as high as to the introduction of our military tenures; when every tenant of a knight's fee was bound, if called upon, to attend the king in his army for 40 days in every year. But this personal attendance growing troublesome in many respects, the tenants found means of compounding for it, by first sending others in their stead, and in process of time by making a pecuniary satisfaction to the crown in lieu of it. This pecuniary satisfaction at last came to be levied by assessments, at so much for every knight's fee, under the name of *scutages*; which appear to have been levied for the first time in the fifth year of Henry II. on account of his expedition to Toulouse, and were then (Sir Wm. Blackstone apprehends) mere arbitrary compositions, as the king and the subject could agree. But this precedent being afterwards abused into a means of oppression, (by levying *scutages* on the landholders by the king's authority only, whenever our kings went to war, in order to hire mercenary troops and pay their contingent expences) it became thereupon a matter of national complaint; and king John was obliged to promise in his *magna carta*, that no *scutage* should be imposed without the consent of the common council of the realm.

Of the same nature with *scutages* upon knights-fees were the assessments of *hytage* upon all other lands, and of *talliage* upon cities and burghs. But they all gradually fell into disuse, upon the introduction of subsidies, about the time of king Richard II. and king Henry IV. These were a tax, not immediately imposed upon property, but upon persons in respect of their reputed estates, after the nominal rate of 4 s. in the pound for lands, and 2 s. 6 d. for goods; and for those of aliens in a double proportion. But this assessment was also made according to an ancient valuation; wherein the computation was so very moderate, and the rental of the kingdom was supposed to be so exceeding low, that one subsidy of this sort did not, according to Sir Edward Coke, amount to more than 70,000 l. whereas a modern land-tax at the same rate produces two millions. It was anciently the rule never to grant more than one subsidy and two fifteenths at a time: but this rule was broke through for the first time on a very pressing occasion, the Spanish invasion in 1588; when the parliament gave queen Elizabeth two subsidies and four fifteenths. Afterwards, as money sunk

in value, more subsidies were given; and we have an instance, in the first parliament of 1640, of the king's desiring 12 subsidies of the commons, to be levied in three years; which was looked upon as a startling proposal: though lord Clarendon tells us, that the speaker, serjeant Glanville, made it manifest to the house, how very inconsiderable a sum 12 subsidies amounted to, by telling them he had computed what he was to pay for them; and when he named the sum, he being known to be possessed of a great estate, it seemed not worth any farther deliberation. And, indeed, upon calculation, we shall find, that the total amount of these 12 subsidies, to be raised in three years, is less than what is now raised in one year by a land-tax of 2 s. in the pound.

The grant of *scutages*, *talliaiges*, or subsidies by the commons did not extend to spiritual preferments; those being usually taxed at the same time by the clergy themselves in convocation: which grants of the clergy were confirmed in parliament; otherwise they were illegal, and not binding; as the same noble writer observes of the subsidies granted by the convocation, which continued sitting after the dissolution of the first parliament in 1640. A subsidy granted by the clergy was after the rate of 4 s. in the pound, according to the valuation of their livings in the king's books; and amounted, Sir Edward Coke tells us, to about 20,000 l. While this custom continued, convocations were wont to sit as frequently as parliaments: but the last subsidies, thus given by the clergy, were those confirmed by statute 15 Car. II. c. 10. since which another method of taxation has generally prevailed, which takes in the clergy as well as the laity: in recompense for which, the beneficed clergy have from that period been allowed to vote at the election of knights of the shire; and thenceforward also the practice of giving ecclesiastical subsidies hath fallen into total disuse.

The lay-subsidy was usually raised by commissioners appointed by the crown, or the great officers of state: and therefore in the beginning of the civil wars between Charles I. and his parliament, the latter, having no other sufficient revenue to support themselves and their measures, introduced the practice of laying weekly and monthly assessments of a specific sum upon the several counties of the kingdom; to be levied by a pound-rate on lands and personal estates: which were occasionally continued during the whole usurpation, sometimes at the rate of 120,000 l. a month, sometimes at inferior rates. After the Restoration the ancient method of granting subsidies, instead of such monthly assessments, was twice, and twice only, renewed; viz. in 1663, when four subsidies were granted by the temporality, and four by the clergy; and in 1670, when 800,000 l. was raised by way of subsidy, which was the last time of raising supplies in that manner. For, the monthly assessments being now established by custom, being raised by commissioners named by parliament, and producing a more certain revenue; from that time forwards we hear no more of subsidies, but occasional assessments were granted as the national emergencies required. These periodical assessments, the subsidies which preceded them, and the more ancient *scutage*, *hytage*, and *talliage*, were to all intents and purposes a land-tax; and the assessments were

**Landaff** were sometimes expressly called so. Yet a popular opinion has prevailed, that the land-tax was first introduced in the reign of king William III.; because in the year 1692 a new assessment or valuation of estates was made throughout the kingdom: which, though by no means a perfect one, had this effect, that a supply of 500,000*l.* was equal to 1*s.* in the pound of the value of estates given in. And, according to this enhanced valuation, from the year 1693 to the present, a period of above 80 years, the land-tax has continued an annual charge upon the subject; above half the time at 4*s.* in the pound, sometimes at 3*s.* sometimes at 2*s.* twice at 1*s.* but without any total intermission. The medium has been 3*s.* 3*d.* in the pound; being equivalent to 23 ancient subsidies, and amounting annually to more than a million and a half of money. The method of raising it is by charging a particular sum upon each county, according to the valuation given in, A. D. 1692; and this sum is affected and raised upon individuals (their personal estates, as well as real, being liable thereto) by commissioners appointed in the act, being the principal land-holders in the county, and their officers.

**LANDAFF**, a town or village of Glamorganshire in South-Wales, with a bishop's see, and on that account has the title of a *city*. It is seated upon an ascent on the river Taff, or Tave, near Cardiff; but the cathedral stands on a low ground, and is a large, stately building. W. Long. 3. 20. N. Lat. 51. 33.

**LANDAU**, an ancient, handsome, and very strong town of France, in Lower Alsace. It was formerly imperial, and belonged to Germany, till the treaty of Munster, when it was given up to France. It is seated on the river Zurich, in a pleasant fertile country. E. Long. 8. 12. N. Lat. 49. 12.

**LANDEN**, a town of the Austrian Netherlands, in Brabant, famous for a battle gained over the French by the allies, in July 1693, when 20,000 men were killed. It is seated on the river Beck, in E. Long. 5. 5. N. Lat. 52. 45.

**LANDERNEAU**, a town of France, in Lower Bretagne, seated on the river Elboro, 20 miles east of Brest. In an inn here is a well which ebbs and flows like the sea, but at contrary times. E. Long. 4. 13. N. Lat. 48. 25.

**LANDRECY**, a town of the French Netherlands, in Hainault, ceded to France by the treaty of the Pyrenees, and is now very well fortified. It was besieged by prince Eugene in 1712, but to no purpose. It is seated on a plain, on the river Sambre, in E. Long. 3. 47. N. Lat. 50. 4.

**LANDGRAVE**, the German name for a count or earl, that has the government of a province, county, or large tract of land.

**LANDGRAVIATE**, or **LANDGRAVATE**, the office, authority, jurisdiction, or territory of a landgrave.

**LANDSCAPE**, See **LANDSKIP**.

**LANDSCROON**, a sea-port town of Sweden, in South-Gothland, and territory of Schonen, seated on the Baltic Sea, within the Sound, 22 miles north of Copenhagen. E. Long. 14. 20. N. Lat. 55. 42.

**LANDSDOWN**, a place in Somersetshire, near Bath, with a fair, on October 10. for cattle and

cheese.

**LANDSHUT**, a strong town of Germany, in Lower Bavaria, with a strong castle, on an adjacent hill. It is seated on the river Iser, in E. Long. 1. 15. N. Lat. 48. 23. There is another small town of the same name in Silesia, and in the duchy of Schweidnitz, seated on the river Zieder, which falls into the Bauber; and there is also another in Moravia, seated on the river Morave, on the confines of Hungary and Austria.

**LANDSKIP**, or **LANDSCAPE**, in painting, the view or prospect of a country extended as far as the eye will reach. See **PAINTING**, n<sup>o</sup> 11. and 22.; and **DRAWING**, sect. 10.

**LANERK-SHIRE**, a county of Scotland, called also *Clydeedale*, from the river Clyde, by which it is watered. It stretches 40 miles in length from south-east to north-west, and 24 at its utmost breadth. It is bounded on the south-east and south, by Annandale and Dumfriesshire; on the north-west and north, by Renfrewshire and Lennox; on the east and north-east, by Linlithgowshire and Stirlingshire; and on the south-east, by part of Midlothian. It is divided into two districts, called the *upper* and *nether ward*; the first, which is roughened with hills and barren heaths, may be denominated the *shire of Lanerk*, the other be distinguished as the *barony of Glasgow*. The Clyde derives its source in the upper ward from Erick-hill, which likewise gives rise to the Tweed and the Annan; and these three rivers pursue different courses. The Clyde falls into the Deucalionian sea; the Annan discharges itself into Solway Frith; and the Tweed runs into the German ocean. The country of Clydesdale, though in some places barren, mountainous, and embrowned with heath, is in general pleasant and fertile, exhibiting intermingled landkips of wood and water, hill and valley. Even the naked mountains are rich in minerals, producing abundance of lead-ore, impregnated with a large proportion of silver. Such are the mines belonging to the duke of Queensberry and the earl of Hopeton, at the lead-hills washed by the rivulet of Wanlock, which employ some thousands of hands, and enrich the proprietors. On the sides of the Wanlock, among the sand and soil swept down from the mountains by torrents, the labourers find often small pieces of pure virgin gold; certain signs that there must be a gold-mine in that neighbourhood. Little bits and particles of the same precious metal have been found in Crawford-muir, together with large pieces of lapis lazuli. In the reign of James VI. Cornelius, a German alchemist, found a gold-mine at Crawford-John in this county, from whence, in thirty days, he sent half a stone weight of pure metal to the mint at Edinburgh. Clydesdale is for the most part a corn-county, abounding with oats, barley, rye, and producing a considerable quantity of wheat; while the hilly parts afford excellent pasturage and plenty of game. It yields also great store of freestone, limestone, excellent coal, together with peat and turf for fuel. It is adorned with a great number of agreeable seats: nor is it deficient in Roman antiquities; for it is penetrated from one end to the other by a Roman causeway or military way, called *Walling-street*, running from Grukstone to the borders of Renfrew. Clydesdale and Lanerk give the titles of *marquis* and

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Langbaine

*earl* to the duke of Hamilton, whose fortune and influence lie chiefly in this province, which is noted for the number of its gentlemen-landholders. Clydesdale is very populous, inhabited by lowlanders, who profess the Presbyterian religion, in which they have signalized their zeal even to a degree of fanaticism. The shire being an inland country, the common people chiefly employ themselves in farming, breeding sheep and cattle, and in the linen manufacture. Lanerker, the county-town, is a royal burrough, and seat of a presbytery; but in other respects thinly inhabited, and of little importance. It stands upon the banks of the Clyde, over which there is a stone-bridge built at a great expence by the inhabitants. At the distance of a few miles from the town, the river tumbles over a precipice forty feet high, producing a cataract that roars with a hideous noise, deafening those who live in its neighbourhood. Below the town, the Clyde is increased by the small river Douglas, which waters a district called *Douglasdale*, deriving this appellation from the noble family of Douglas, whose ancient castle is situated near the banks of this river. At the distance of ten miles from Lanerker stand the castle and burgh of Crawford-town, remarkable for nothing but giving the title of *earl* to the noble family of Lindsay: a title which, by the death of the late earl, has now devolved to the viscount of Garroch, sprung from the same house, though his surname is changed from Lindsay to Crawford in consequence of a marriage. But the chief place of Lanerker-shire, and indeed the great emporium of the west of Scotland, is the large, elegant, and flourishing city of GLASGOW; for a description of which, see that article.

LANFRANC, an Italian, born at Pavia, became archbishop of Canterbury in 1070. He disputed against Berengarius, in the council held at Rome in 1059, and wrote against him concerning the real presence in the eucharist. He had other disputes, &c. and died in 1089.

LANFRANC (John), an eminent Italian history-painter, born at Parma in 1581. He was first the disciple of Augustin Caracci; and, after his death, of Hannibal, whose taste in design and colouring he so happily attained, that he was intrusted to execute some of his designs in the Farnesian palace at Rome. These he finished in so masterly a manner, that the difference is imperceptible to this day between his work and that of his master. His genius directed him to grand compositions, which he had a peculiar facility in designing and in painting either in fresco or in oil: he did indeed aspire to the grace of Correggio, but could never arrive at his excellence; his greatest power being manifested in composition and foreshortening. He was deficient in correctness and expression; and his colouring, though sometimes admirable, was frequently too dark. By order of pope Urban VIII. he painted in St Peter's church at Rome the representation of that saint walking on the water, which afforded the pope so much satisfaction, that he knighted him. He died in 1647.

LANGBAINE (Gerard), D. D. a learned English writer, was born in 1608. He was educated at Queen's-college, Oxford; and became keeper of the archives of that university, provost of his college, and

doctor of divinity. He was highly esteemed by arch-bishop Usher, Selden, and several other learned men; and died in 1657-8. He published, 1. An edition of Longinus, in Greek and Latin, with notes. 2. A review of the covenant; and other works.

LANGBAINE (Gerard), an eminent writer, the son of the former, was born in 1656. He was put apprentice to Mr Symonds, bookseller in St Paul's church-yard; but was soon after called from thence by his mother, upon the death of his eldest brother, and by her entered a gentleman-commoner of University-college, Oxford, in 1672. Here he run out a good part of his estate; but afterwards corrected his manner of living, and for some years lived in retirement near Oxford. During this time he improved his taste for dramatic poetry; and at first wrote some small pieces without his name, but afterwards published several works which he publicly owned. In 1690 he was elected inferior beadle of arts in the university of Oxford; and, in January following, was chosen superior beadle of law, but died soon after in 1692. He wrote, 1. The hunter, a discourse on horsemanship. 2. A new catalogue of English plays, with their best editions, and divers remarks on the originals of most plays, and on the plagiarisms of several authors. 3. An account on the English dramatic poets.

LANGELAND (Robert), an old English poet of the 14th century, and one of the first disciples of Wickliffe the reformer. He is said to have been born in Shropshire, but we have no account of his family. He wrote *The visions of Pierce Plowman*; a piece which abounds with imagination and humour, though dressed to great disadvantage in very uncouth verification and obsolete language. It is written without rhyme, an ornament which the poet has endeavoured to supply by making every verse begin with the same letter. Dr Hickee observes, that this kind of alliterative verification was adopted by Langeland from the practice of the Saxon poets, and that these visions abound with Saxonisms: he styles him *celeberrimus ille satirographus, morum vindex acerrimus*, &c. Chaucer and Spencer have attempted imitations of his visions, and the learned Selden mentions him with honour.

LANGELAND, an island of Denmark in the Baltic sea, in the streight called *the great belt*, and between Zealand, Saland, and Fyonia. It produces plenty of corn, and the principal town is Ruteping. E. Long. 11. 10. N. Lat. 55. o.

LANGETZ, a town of France in Touraine, noted for its excellent melons. It is seated on the river Loire, in E. Long. o. 23. N. Lat. 42. 20.

LANGIONA, a large, rich, and strong town of Afa, capital of the kingdom of Laos, with a large and magnificent palace, where the king resides. E. Long. 96. 45. N. Lat. 22. 38.

LANGREL-SHOT, at sea, that consisting of two bars of iron joined by a chain or shackle, and having half a ball of iron fixed on each end; by means of which apparatus, it does great execution among the enemy's rigging.

LANGRES, an ancient and considerable town of France, in Champagne, with a bishop's see. The cutlery-wares made here are in high esteem. It is

seated.

Langres.



Langton, seated on a mountain near the river Mearne, in E. Long. 4. 24. N. Lat. 47. 52.

Language.

LANGTON (Stephen), was born in England, but educated at Paris, and was greatly esteemed for his learning by the king and nobility of France. He was chancellor of Paris, a cardinal of Rome, and in the reign of king John was made archbishop of Canterbury by Pope Innocent III. in opposition both to the monks of Canterbury and to the king. Langton was one of the most illustrious men of his age for learning; and continued archbishop 22 years, dying in 1228. A catalogue of his books is given by Bale and Tanner.

LANGUAGE, in the most general meaning of the word, signifies any sound uttered by an animal, by which it expresses any of its passions, sensations, or affections; but it is more particularly understood to denote those various modifications of the human voice, by which the several sensations and ideas of one man are communicated to another.

2. Nature has endowed every animal with powers sufficient to communicate to others of the same species some of its sensations and desires. The organs of most animals are so formed, as readily to perceive and understand (as far as is necessary for their particular species of existence) the voice of those of their own kind; by means of which they assemble together, for the defence or preservation of the species. But as they rise higher in the order of intellectual powers, the powers of expression likewise increase; and the voice alone, even when endowed with a great extent of modulation, is incapable of conveying all that variety of emotions and sensations which on many occasions are necessary to be communicated. In all these cases, motion and gesture are called in to supply the defects of the voice. The amorous pigeon does not trust solely to his plaintive cooing, in order to soften the rigour of his reluctant mate, but adds to it the most submissive and expressive gestures; and the faithful dog, finding his voice alone insufficient to express his joy at meeting with his master, is obliged to have recourse to a variety of endearing actions. But man—the most distinguished of all the animal creation,—although endowed with a power of voice and expression of countenance and gesture eminently superior to all the creatures of God, finds, that all these united are not sufficient to express the infinite variety of ideas with which his mind is stored: for although these may powerfully express the passions and stronger feelings of the mind; yet as they are incapable of expressing the several progressive steps of perception by which his *reason* ascends from one degree of knowledge to another, he has been obliged to discover, by means of his reasoning faculty, a method of expressing with certainty, and communicating with the utmost facility, every perception of his mind.—With this view, having observed, that besides the power of uttering simple sounds, and the several variations of these into acute or grave, open or shrill, &c. by which his stronger feelings were naturally expressed, he was likewise endowed with a power of stopping or interrupting these sounds, by certain closings of the lips with one another, and of the tongue with the palate, &c. he has taken advantage of these circumstances, and formed unto himself a language capable of expressing every

perception of the mind; for, by affixing at all times the same idea to any one sound or combination of sounds thus modified and joined together, he is enabled at any time to excite in the mind of any other person an idea similar to that in his own mind, provided the other person has been previously so far instructed as to know the particular modification of sound which has been agreed upon as the *symbol* of that idea.—Thus man is endowed with two different species of language: one consisting of tones and gestures; which, as it is natural to man considered as a distinct species of animals, and necessary for the preservation and well-being of the whole, is universally understood by all mankind: thus laughter and mirth universally express cheerfulness of mind; while tears, in every part of the globe, discover a heart overflowing with tender sensations; and the humble tone of supplication, or the acute accent of pain, are equally understood by the Hurons of America, and by the more refined inhabitants of Europe. The other species of language, as it is entirely artificial, and derives its power from particular compact, (for before any thing can be recognized as the symbol of an idea, several persons must first agree that such an idea shall be always denoted by this symbol), must be different in different parts of the globe; and every distinct form which it may assume, from the different genius of every society who originally formed a particular language for themselves, will be altogether unintelligible to every other body of men, but those belonging to the same society where that language was originally invented, or those who have been at pains to acquire a knowledge of it by means of study.

3. It is unnecessary for us here to draw any parallel between the nature of these two different species of language; it being sufficiently evident, that the artificial language does not debar the use of the tones and gestures of the natural, but tends to ascertain the meaning of these with greater precision, and consequently to give them greater power. Man must therefore reap many advantages from the use of artificial language, which he could not have enjoyed without it. It is equally plain, that the one, being natural and inspired, must remain nearly the same, without making any progress to perfection; whereas the other, being entirely the invention of man, must have been exceedingly rude and imperfect at first, and must have arrived by slow degrees at greater and greater perfection, as the reasoning faculties acquired vigour and acuteness. It must likewise be subject to perpetual changes, from that variety of incidents which affect all sublunary things; and these changes must always correspond with the change of circumstances in the people who make use of that particular language: for when any particular set of ideas become prevalent among any society of men, words must be adopted to express them; and from these the language must assume its character. Hence the reason why the language of all barbarous and uncivilized people is rude and uncultivated; while those nations which have improved their reasoning faculties, and made some progress in the polite arts, have been no less distinguished by the superiority of their language than by their pre-eminence in other respects.—The language of a brave and martial people is bold and nervous, altho'

Language.

perhaps rude and uncultivated; while the language of those nations in which luxury and effeminacy prevail, is flowing and harmonious, but devoid of force and energy of expression.

4. But although it may be considered as a general rule, that the language of any nation is a very exact index of the state of their minds; yet it admits of some particular exceptions. For as man is naturally an imitative animal, and in matters of this kind never has recourse to invention but through necessity; if by some accident any part of a nation should be separated from that community to which they belonged, after a language had been invented, they would retain the same general sounds and *idiom* of language with those from whom they were separated; although in process of time these two people, by living in countries of a dissimilar nature, or being engaged in different occupations, and leading a different manner of life, might lose all knowledge of one another, assume a different national character and opposite dispositions of mind, and form each of them a distinct language to themselves, totally different in genius and style, though agreeing with one another in the fundamental sounds and general *idiom*: so that if this particular *idiom*, formed before their separation, should happen to be more peculiarly adapted to the genius of one of these people than the other, that particular people whose natural genius and style of language was not in concord with the *idiom* which they had adopted, would labour under an inconvenience on this account which they never would be able entirely to overcome; and this inconvenience would prevent their language from attaining such a degree of perfection, as the genius of the people would otherwise naturally have led them to. Thus languages have been originally formed; and thus that happy concord of circumstances which have concurred to raise some languages to that height of perfection which they have attained may be easily accounted for, while many ineffectual efforts have been made to raise other languages to the same degree of excellence.

5. We shall not here enter upon any fruitless inquiries, with a view to discover if only one language was originally formed, or if any language that we are acquainted with has a greater claim to that much envied pre-eminence than others. We have seen, that the discovery of language is entirely within our reach, and evidently the invention of man; and therefore that the invention of different languages by different societies, is extremely probable. But it behoved these different societies, in process of time, to intermix by war or commerce, and their different languages would likewise become mixed. Hence during the succession of many ages, while the principles of language were not understood, many different languages must have been formed, while others may have sunk into oblivion, especially in those early ages before the invention of letters, which alone could preserve their memory. In vain, therefore, would we endeavour to discover the state of those nations or languages of which we have but obscure traces in history. Indeed we have no reason to lament our loss in this particular; for, supposing such a discovery could be made, we could derive little advantage from it, as the antiquity of a language does not necessarily imply any degree of excellence, seeing we all know that some nations have made more progress in impro-

ving their mental faculties, and refining their language, in a few years, than others have done in many ages. We shall therefore leave this subject, and proceed to make some remarks on the advantages or defects of some of those *idioms* of language with which we are most intimately acquainted, as this may perhaps lead us to some discoveries of real utility to ourselves.

6. As the words *IDIOM* and *GENIUS* of a language are often confounded, it will be necessary to inform the reader, that by *IDIOM* we would here be understood to mean *that general mode of arranging words into sentences which prevails in any particular language*; and by the *GENIUS* of a language we mean to express *the particular set of ideas which the words of any language, either from their formation or multiplicity, are most naturally apt to excite in the mind of any one who hears it properly uttered*. Thus although the *English*, *French*, *Italian*, and *Spanish* languages, nearly agree in the same general *idiom*; yet the particular *GENIUS* of each is remarkably different: The *English* is naturally bold, nervous, and strongly articulated; the *French* is weaker, and more flowing; the *Italian* more soothing and harmonious; and the *Spanish* more grave, sonorous, and stately. Now, when we examine the several languages which have been most esteemed in Europe, we find that there are only two distinct *idioms* among them which are essentially distinguished from one another; and all those languages are divided between these two *idioms*, following sometimes the one, and sometimes the other, either wholly or in part. The languages which may be said to adhere to the first *idiom*, are those which in their construction follow the order of nature; that is, express their ideas in the natural order in which they occur to the mind; the subject which occasions the action appearing first; then the action, accompanied with its several modifications; and, last of all, the object to which it has reference.—These may properly be called *ANALOGOUS* languages; and of this kind are the *English*, *French*, and most of the modern languages in Europe.—The languages which may be referred to the other *idiom*, are those which follow no other order in their construction than what the taste or fancy of the composer may suggest; sometimes making the object, sometimes the action, and sometimes the modification of the action, to precede or follow the other parts. The confusion which this might occasion is avoided by the particular manner of *inflecting* their words, by which they are made to refer to the others with which they ought to be connected, in whatever part of the sentence they occur, the mind being left at liberty to connect the several parts with one another after the whole sentence is concluded. And as the words may be here transposed at pleasure, those languages may be called *TRANSPOSITIVE* languages. To this class we must, in an especial manner, refer the *Latin* and *Greek* languages.—As each of these *idioms* has several advantages and defects peculiar to itself, we shall endeavour to point out the most considerable of them, in order to ascertain with greater precision the particular character and excellence of some of those languages now principally spoken or studied in Europe.

7. The partiality which our forefathers, at the revival of letters in Europe, naturally entertained for the Greek and Roman languages, made them look upon every distinguishing peculiarity belonging to them, as

Language. one of the many causes of the amazing superiority which those language evidently enjoyed above every other at that time spoken in Europe.—This blind deference still continues to be paid to them, as our minds are early prepossessed with these ideas, and as we are taught in our earliest infancy to believe, that to entertain the least idea of our own language being equal to the Greek or Latin in any particular whatever, would be a certain mark of ignorance or want of taste.—Their rights, therefore, like those of the church in former ages, remain still to be examined; and we, without exerting our reason to discover truth from falsehood, tamely sit down satisfied with the idea of their undoubted pre-eminence in every respect.—But if we look around us for a moment, and observe the many excellent productions which are to be met with in almost every language of Europe, we must be satisfied, that *even these* are now possessed of *some* powers which might afford at least a presumption, that, if they were cultivated with a proper degree of attention, they might, in *some respects*, be made to rival, if not to excel, those beautiful and justly admired remains of antiquity.—Without endeavouring to derogate from their merit, let us, with the cool eye of philosophic reasoning, endeavour to bring before the sacred tribunal of Truth some of those opinions which have been most generally received upon this subject, and rest the determination of the cause on her impartial decision.

8. The learned reader well knows, that the several changes which take place in the arrangement of the words in every TRANSPOSITIVE language could not be admitted without occasioning great confusion, unless certain classes of words were endowed with particular variations, by means of which they might be made to refer to the other words with which they ought naturally to be connected.—From this cause proceeds the necessity of several variations of *verbs, nouns, and adjectives*; which are not in the least essential or necessary in the ANALOGOUS languages, as we have pretty fully explained under the article GRAMMAR, to which we refer for satisfaction on this head. We shall in this place consider, whether these variations are an advantage or a disadvantage to language.

9. As it is generally supposed, that every language whose verbs admit of *inflection*, is on that account much more perfect than one where they are varied by *auxiliaries*; we shall, in the first place, examine this with some degree of attention; and that what is said on this head may be the more intelligible, we shall give examples from the Latin and English languages. We make choice of these languages, because the Latin is more purely *transpositive* than the Greek, and the English admits of less *inflection* than any other language that we are acquainted with.

10. If any preference be due to a language from the one or the other method of *conjugating* verbs, it must in a great measure be owing to one or more of these three causes:—Either it must admit of a greater variety of sounds, and consequently more room for harmonious diversity of tones in the language:—or a greater freedom of expression is allowed in uttering any simple idea, by the one admitting of a greater variety in the arrangement of the words which are necessary to express that idea than the other does:—or, lastly, a greater precision and accuracy in fixing the meaning of the person who uses the language, arise from the use

of one of these forms above the other:—for, as every other circumstance which may serve to give a diversity to language, such as the general and most prevalent sounds, the frequent repetition of any one particular letter, and a variety of other circumstances of that nature, which may serve to debase a particular language, are not influenced in the least by the different methods of varying the verbs, they cannot be here considered. We shall therefore proceed to make a comparison of the advantages or disadvantages which may accrue to language by inflecting their verbs, with regard to each of these particulars.

11. The *first* particular that we have to examine is, Whether the one method of expressing the variations of a verb admits of a greater variety of sounds.—In this respect the *Latin* seems, at first view, to have a great advantage over the *English*: for the words *amo, amabam, amaveram, amavero, ameni*, &c. seem to be more different from one another than the English translations of these, *I love, I did love, I had loved, I shall have loved, I may love*, &c.; for, although the syllable *am* is repeated in every one of the first, yet as the last syllable usually strikes the ear with greater force, and leaves a greater impression than the first, it is very probable that many will think the frequent repetition of the word *love* will, in the last instance, appear more striking to the ear than the other. We will therefore allow this its full weight, and grant that there is as great, or even a greater difference between the sounds of the different *tenses* of a Latin verb, than there is between the words that are equivalent to them in English. But as we here consider the variety of sounds of the language in general, before any just conclusion can be drawn, we must not only compare the different parts of the same verb, but also compare the different verbs with one another in each of these languages. And here, at first view, we perceive a most striking distinction in favours of the *analogous* language over the *inflected*: for as it would be impossible to form a particular set of inflections different from one another for each particular verb, all those languages which have adopted this method have been obliged to reduce their verbs into a small number of classes; all the words of each of which classes, commonly called *conjugations*, have the several variations of the *modes, tenses, and persons*, expressed exactly in the same manner, which must of necessity introduce a similarity of sounds into the language in general, much greater than where every particular verb always retains its own distinguishing sound.—To be convinced of this, we need only repeat any number of verbs in Latin and English, and observe on which side the preference with respect to variety of sounds must fall.

|         |                 |           |                   |
|---------|-----------------|-----------|-------------------|
| Pono,   | <i>I put.</i>   | Moveo,    | <i>I move.</i>    |
| Dono,   | <i>I give.</i>  | Doleo,    | <i>I ail.</i>     |
| Cano,   | <i>I sing.</i>  | Lugeo,    | <i>I mourn.</i>   |
| Sono,   | <i>I sound.</i> | Obeo,     | <i>I die.</i>     |
| Orno,   | <i>I adorn.</i> | Gaudeo,   | <i>I rejoice.</i> |
| Pugno,  | <i>I fight.</i> | Incipio,  | <i>I begin.</i>   |
| Lego,   | <i>I read.</i>  | Facio,    | <i>I make.</i>    |
| Scribo, | <i>I write.</i> | Podio,    | <i>I dig.</i>     |
| Puto,   | <i>I think.</i> | Rideo,    | <i>I laugh.</i>   |
| Vivo,   | <i>I live.</i>  | Impleo,   | <i>I fill.</i>    |
| Ambulo, | <i>I walk.</i>  | Abstinco, | <i>I forbear.</i> |

12. The similarity of sounds is here so obvious in the



13. But if, instead of the present of the indicative mood, we should take almost any other tense of the Latin verb, the similarity of sounds would be still more perceptible, as many of these tenses have the same termination in all the four conjugations, particularly in the imperfect of the indicative, as below.

|              |                       |                    |
|--------------|-----------------------|--------------------|
| Pone-bam;    | <i>I did put,</i>     | <i>I put.</i>      |
| Dona-bam;    | <i>I did give,</i>    | <i>I gave.</i>     |
| Cane-bam;    | <i>I did sing,</i>    | <i>I sung.</i>     |
| Sona-bam;    | <i>I did sound,</i>   | <i>I sounded.</i>  |
| Orna-bam;    | <i>I did adorn,</i>   | <i>I adorned.</i>  |
| Pugna-bam;   | <i>I did fight,</i>   | <i>I fought.</i>   |
| Lege-bam;    | <i>I did read,</i>    | <i>I read.</i>     |
| Scribe-bam;  | <i>I did write,</i>   | <i>I wrote.</i>    |
| Put-a-bam;   | <i>I did think,</i>   | <i>I thought.</i>  |
| Vive-bam;    | <i>I did live,</i>    | <i>I lived.</i>    |
| Ambula-bam;  | <i>I did walk,</i>    | <i>I walked.</i>   |
| Move-bam;    | <i>I did move,</i>    | <i>I moved.</i>    |
| Dole-bam;    | <i>I did ail,</i>     | <i>I ailed.</i>    |
| Luge-bam;    | <i>I did mourn,</i>   | <i>I mourned.</i>  |
| Obi-bam;     | <i>I did die,</i>     | <i>I died.</i>     |
| Gaude-bam;   | <i>I did rejoice,</i> | <i>I rejoiced.</i> |
| Incipie-bam; | <i>I did begin,</i>   | <i>I began.</i>    |
| Facie-bam;   | <i>I did make,</i>    | <i>I made.</i>     |
| Fodie-bam;   | <i>I did dig,</i>     | <i>I dug.</i>      |
| Ride-bam;    | <i>I did laugh,</i>   | <i>I laughed.</i>  |
| Imple-bam;   | <i>I did fill,</i>    | <i>I filled.</i>   |
| Abstine-bam; | <i>I did forbear,</i> | <i>I forbore.</i>  |

4. It is unnecessary to make any remarks on the Latin words in this example; but in the English translation we have carefully marked, in the first column, the words without any inflection; and, in the second, have put down the same meaning by an inflection of our verb; which we have been enabled to do, from a peculiar excellency in our own language unknown to any other either ancient or modern. Were it necessary to pursue this subject farther, we might observe, that the *perfect* tense in all the conjugations ends universally in *I*, the *pluperfect* in *ERAM*, and the *future* in *AM* or *BO*; in the subjunctive mood, the *imperfect* universally in *REM*, the *perfect* in *ERIM*, the *pluperfect* in *ISSEM*, and the *future* in *ERO*: and as a still greater sameness is observable in the different variations for the persons in

these tenses, seeing the first person plural in all tenses ends in *MUS*, and the second person in *TIS*, with little variation in the other persons; it is evident, that, in respect of diversity of sounds, this method of conjugating verbs by *inflection*, is greatly inferior to the more natural method of expressing the various connections and relations of the verbal attributive by different words, usually called *auxiliaries*.

15. The second particular by which the different methods of marking the relation of the verbal attributive can affect language, arises from the variety of expressions, which either of these may admit of in uttering the same sentiment.—In this respect, likewise, the method of conjugating by inflection seems to be deficient. Thus the present of the indicative mood in Latin can at most be expressed only in two ways, viz. *scribo*, and *ego scribo*; which ought perhaps in strictness to be admitted only as one: whereas, in English, we can vary it in four different ways, viz. *1st*, *I write*; *2dly*, *I do write*; *3dly*, *Write I do*; *4thly*, *Write do I (A)*. And if we consider the further variation which these receive in power as well as in sound, by having the accent placed on the different words; instead of four, we will find eleven different variations: thus, *1st*, *I write*, with the emphasis upon the *I*;—*2dly*, *I write*, with the emphasis upon the word *write*. Let any one pronounce these with the different accent necessary, and he will be immediately satisfied that they are not only distinct from each other with respect to meaning, but also with regard to sound; and the same must be understood of all the other parts of this example.

- |                       |                        |
|-----------------------|------------------------|
| 3. <i>I do write,</i> | 8. <i>Write I do,</i>  |
| 4. <i>I do write,</i> | 9. <i>Write do I,</i>  |
| 5. <i>I do write,</i> | 10. <i>Write do I.</i> |
| 6. <i>Write I do,</i> | 11. <i>Write do I.</i> |
| 7. <i>Write I do.</i> |                        |

None of the Latin tenses admit of more variations than the two above mentioned: nor do almost any of the English admit of fewer than in the above example; and several of these phrases, which must be considered as exact translations of some of the tenses of the Latin verb, admit of many more. Thus the imperfect of the subjunctive mood, which in Latin admits of the above two variations, admits in English of the following:

- |                               |                               |
|-------------------------------|-------------------------------|
| 1. <i>I might have wrote.</i> | 4. <i>Wrote might have I.</i> |
| 2. <i>Wrote I might have.</i> | 5. <i>I wrote might have.</i> |
| 3. <i>Have wrote I might.</i> | 6. <i>Have wrote might I.</i> |

And if we likewise consider the variations which may be produced by a variation of the emphasis, they will be as under.

1. *I*

(A) We are sufficiently aware, that the last variation cannot in strictness be considered as good language; although many examples of this manner of using it in serious compositions, both in poetry and prose, might be easily produced from the best authors in the English Language.—But however unjustifiable it may be to use it in serious composition; yet, when judiciously employed in works of humour, this and other forced expressions of the like nature produce a fine effect, by giving a burlesque air to the language, and beautifully contrasting it to the purer diction of solid reasoning. The fagacious Shakespeare has, on many occasions, shewed how successfully these may be employed in composition, particularly in drawing the character of *ancient Pistol*, in Henry V. Without this liberty, Butler would have found greater difficulty in drawing the inimitable character of Hudibras.—Let this apology suffice for our having inserted this and other variations of the same kind; which, although they may be often improper for serious composition, have still their use in language.



Language.

1. *I might have wrote.*
2. *I MIGHT have wrote.*
3. *I might HAVE wrote.*
4. *I might have WRITE.*
5. *WRITE I might have.*
6. *Wrote I might have.*
7. *Wrote I MIGHT have.*
8. *Wrote I might HAVE.*
9. *HAVE wrote I might.*
10. *HAVE WRITE I might.*
11. *Have wrote I might.*
12. *Have wrote I MIGHT.*
13. *WRITE might have I.*
14. *Wrote MIGHT have I.*
15. *Wrote might HAVE I.*
16. *Wrote might have WRITE.*
17. *I wrote might have.*
18. *I WRITE might have.*
19. *I wrote MIGHT have.*
20. *I wrote might HAVE.*
21. *HAVE wrote might I.*
22. *HAVE WRITE might I.*
23. *Have wrote MIGHT I.*
24. *Have wrote might I.*

In all 24 variations, instead of two.—If we likewise consider, that the Latins were obliged to employ the same word, not only to express “*I might have wrote*,” but also, “*I could, I would, or I should have wrote*,” each of which would admit of the same variations as the word *might*; we have in all ninety-six different expressions in English for the same phrase which in Latin admits only of two, unless they have recourse to other forced turns of expression, which the defects of their verbs in this particular has compelled them to invent.

16. But, if it should be objected, that the last circumstance we have taken notice of as a defect, can only be considered as a defect of the Latin language, and is not to be attributed to the *inflection* of their verbs, seeing they might have had a particular tense for each of these different words *might, could, would, and should*; we answer, that, even admitting this excuse as valid, the superiority of the analogous language, as such, still remains in this respect as 12 to 1.—Yet even this concession is greater than ought to have been made: For as the difficulty of forming a sufficient variety of words for all the different modifications which a verb may be made to undergo is too great for any rude people to overcome; we find, that every nation which has adopted this mode of inflection, not excepting the Greeks themselves, has been obliged to remain satisfied with fewer words than would have been necessary even to effect this purpose, and make the same word serve a double, treble, or even quadruple office, as in the Latin tense which gave rise to these observations: So that, however in physical necessity this may not be chargeable upon this particular mode of construction, yet in moral certainty it must always be the case; and therefore we may safely conclude, that the mode of varying verbs by *inflection* affords less variety in the arrangement of the words of the particular phrases, than the method of varying them by the help of auxiliaries.

17. But if there should still remain any shadow of doubt in the mind of the reader, whether the method of varying the verbs by *inflection*, is inferior to that by *auxiliaries*, with regard to diversity of sounds, or variety of expression; there cannot be the least doubt, but that, with respect to precision, distinctness, and accuracy, in expressing any idea, the latter enjoys a superiority beyond all comparison.—Thus the Latin verb *Amo*, may be Englished either by the words, *I love*, or *I do love*, and the emphasis placed upon any of the words that the circumstances may require; by means of which, the meaning is pointed out with a force and energy which it is altogether impossible to produce by the use of any single word. The fol-

lowing line from Shakspeare's *Othello* may serve as an example:

—Excellent wretch!

Perdition catch my soul, but *I do love thee*:

In which the strong emphasis upon the word *do*, gives it a force and energy which conveys, in an irrefragable manner, a most perfect knowledge of the situation of the mind of the speaker at the time.—That the whole energy of the expression depends upon this seemingly insignificant word, we may be at once satisfied of, by keeping it away in this manner:

—Excellent wretch!

Perdition catch my soul, but *I love thee*.

How poor—how tame—how insignificant is this, when compared with the other! Here nothing remains but a tame assertion, ushered in with a pompous exclamation which could not here be introduced with any degree of propriety. Whereas, in the way that Shakspeare has left it to us, it has an energy which nothing can surpass; for, overpowered with the irresistible force of Desdemona's charms, this strong exclamation is extorted from the soul of Othello in spite of himself. Surprised at this tender emotion, which brings to his mind all those amiable qualities for which he had so much esteemed her, and at the same time fully impressed with the firm persuasion of her guilt, he bursts out into that seemingly inconsistent exclamation, *Excellent wretch!* and then he adds in the warmth of his surprise,—thinking it a thing most astonishing that any warmth of affection should still remain in his breast, he even confirms it with an oath,—*Perdition: catch my soul, but I do love thee.*—“In spite of all the falsehoods with which I know thou hast deceived me—in spite of all the crimes of which I know thee guilty—in spite of all those reasons for which I ought to hate thee—in spite of myself,—still I find that I love,—yes, I do love thee.” We look upon it as a thing altogether impossible to transfuse the energy of this expression into any language whose verbs are regularly inflected.

18. In the same manner we might go through all the other tenses, and shew that the same superiority is to be found in each.—Thus, in the *perfect tense* of the Latins, instead of the simple *AMAVI*, we say, *I HAVE LOVED*; and by the liberty we have of putting the emphasis upon any of the words which compose this phrase, we can in the most accurate manner fix the precise idea which we mean to excite: for if we say, *I have loved*, with the emphasis upon the word *I*, it at once points out the person as the principal object in that phrase, and makes us naturally look for a contrast in some other person, and the other parts of the phrase become subordinate to it;—“*he has loved thee much, but I have loved thee infinitely more.*” The Latins too, as they were not prohibited from joining the pronoun with their verb, were also acquainted with this excellence, which Virgil has beautifully used in this verse:

—Nos patriam fugimus;

Tu, Tytere, lentus in umbra, &c.

But we are not only enabled thus to distinguish the person in as powerful a manner as the Latins, but can also with the same facility point out any of the other circumstances as principals; for if we say, with the emphasis—

Language. emphasis upon the word *have*, "I HAVE loved," it as naturally points out the time as the principal object, and makes us look for a contrast in that peculiarity, I HAVE: "I have loved indeed;—my imagination *has* been led astray—my reason *has* been perverted:—but, *now* that time has opened my eyes, I can smile at those imaginary distresses which once perplexed me."—In the same manner we can put the emphasis upon the other word of the phrase *loved*,—"I have LOVED."—Here the passion is exhibited as the principal circumstance; and as this can never be excited without some object, we naturally wish to know the object of that passion—"Who! what have you *loved*?" are the natural questions we would put in this case. "I have LOVED—Eliza."—In this manner we are, on all occasions, enabled to express, with the utmost precision, that particular idea which we would wish to excite, so as to give an energy and perspicuity to the language, which can never be attained by those languages whose verbs are conjugated by inflection: and if to this we add the inconvenience which all inflected languages are subject to, by having too small a number of tenses, so as to be compelled to make one word, on many occasions, supply the place of two, three, or even four, the balance is turned still more in our favours.—Thus, in Latin, the same word *AMABO* stands for *shall* or *will* love, so that the reader is left to guess from the context which of the two meanings it was most likely the writer had in view.—In the same manner, *may* or *can* love are expressed by the same word *AMEN*; as are also *might*, *could*, *would*, or *should* love, by the single word *AMAREM*, as we have already observed; so that the reader is left to guess which of these four meanings the writer intended to express: which occasions a perplexity very different from that clear precision which our language allows of, by not only pointing out the different words, but also by allowing us to put the emphasis upon any of them we please, which superadds energy and force to the precision it would have had without that assistance.

19. Upon the whole, therefore, after the most candid examination, we must conclude, that the method of conjugating verbs by *inflection* is inferior to that which is performed by the help of *auxiliaries*;—because it does not afford such a diversity of sounds, nor allow such variety in the arrangement of expression for the same thought,—nor give so great distinction and precision in the meaning.—It is, however, attended with one considerable advantage above the other method: for as the words of which it is formed are necessarily of greater length, and more sonorous, than in the analogous languages, it admits of a more flowing harmony of expression; for the number of monosyllables in this last greatly checks that pompous dignity which naturally results from longer words. Whether this single advantage is sufficient to counterbalance all the other defects with which it is attended, is left to the judgment of the reader to determine:—but we may remark, before we quit the subject, that even this excellence is attended with some peculiar inconveniences, which shall be more particularly pointed out in the sequel.

20. But perhaps it might still be objected, that although the comparison we have made above may be fair, and the conclusion just, with regard to the Latin and English languages; yet it does not appear clear, that on that account the method of conjugating verbs by *inflection* is *inferior* to that by *auxiliaries*: for although it be allowed, that the Latin language is defective in point of tenses; yet if a language were formed which had a sufficient number of inflected tenses to answer every purpose; if it had, for instance, a word properly formed for every variation of each tense; one for *I love*, another for *I do love*; one for *I shall*, another for *I will love*; one for *I might*, another for *I could*, and *would*, and *should love*; and so on through all the other tenses; that this language would not be liable to the objections we have brought against the inflection of verbs; and that of course, the objections we have brought are only valid against those languages which have followed that mode and executed it imperfectly.—We answer, that although this would in some measure remedy the evil, yet it would not remove it entirely. For in the first place, unless every verb, or a very small number of verbs, were conjugated in one way, having the sound of the words in each tense, and divisions of tenses, as we may say, different from all the other conjugations,—it would always occasion a sameness of sound, which would in some measure prevent that variety of sounds so proper for a language. And even if this could be effected, it would not give such a latitude to the expression as auxiliaries allow: for although there should be two words, one for *I might*, and another for *I could love*; yet as these are single words, they cannot be varied; whereas, by auxiliaries, either of these can be varied 24 different ways, as has been shewn above.—In the last place, no single word can ever express all that variety of meaning which we can do by the help of our auxiliaries and the emphasis. *I have loved*, if expressed by any one word, could only denote at all times one distinct meaning; so that, to give it the power of ours, three distinct words at least would be necessary. However, if all this were done;—that is, if there were a distinct conjugation formed for every 40 or 50 verbs;—if each of the tenses were properly formed, and all of them different from every other tense as well as every other verb; and these all carried thro' each of the different persons, so as to be all different from one another;—and if likewise there were a distinct word to mark each of the separate meanings which the same tense could be made to assume by means of the emphasis; and if all this infinite variety of words could be formed in a distinct manner, different from each other, and harmonious;—this language would have powers greater than any that could be formed by auxiliaries, if it were possible for the human powers to acquire such a degree of knowledge as to be able to employ it with facility. But how could this be attained, since upwards of ten thousand words would be necessary to form the variations of any one verb, and a hundred times that number would not include the knowledge of the verbs alone of such a language (a)!—How much, therefore, ought we to admire the simple perspicuity of our language, which

(a) This assertion may perhaps appear to many very much exaggerated: but if any should think so, we only beg the favour that he will set himself to mark all the variations of tenses, mode, person, and number, which an English verb

Language. which enables us, by the proper application of ten or twelve seemingly trifling words, the meaning and use of which can be attained with the utmost ease, to express all that could be expressed by this unwieldy apparatus? What can equal the simplicity or the power of the one method, but the well-known powers of the 24 letters, the knowledge of which can be obtained with so much ease—and their powers know no limits?—or what can be compared to the sacred perfection of the other, but the transcript of it which the Chinese seem to have formed in their unintelligible language?

21. Having thus considered pretty fully the advantages and defects of each of these two methods of varying verbs, we cannot help feeling a secret wish arise in our mind, that there had been a people sagacious enough to have united the powers of the one method with those of the other; nor can we help being surprised, that, among the changes which took place in the several languages of Europe after the downfall of the Roman monarchy, some of them did not accidentally stumble on the method of doing it. From many concurring circumstances, it seems probable, that the greatest part, if not all the Gothic nations that overran Italy at that time, had their verbs varied by the help of auxiliaries; and many of the modern European languages which have sprung from them, have so far borrowed from the Latin, as to have some of the tenses of their verbs inflected: yet the English alone have in any instance combined the joint powers of the two: which could only be done by forming inflections for the different tenses in the same manner as the Latins, and at the same time retaining the original method of varying them by auxiliaries; by which means either the one or the other method could have been employed as occasion required. We have luckily two tenses formed in that way; the *present* of the indicative, and the *pass.* In almost all our verbs these can be declined either with or without auxiliaries. Thus the present, without an auxiliary, is, *I love, I write, I speak*; with an auxiliary, *I do write, I do love, I do speak*. In the same manner, the past tense, by inflection, is, *I loved, I wrote, I spoke*; by auxiliaries, *I did love, I did speak, I did write*. Every author, who knows any thing of the power of the English language, knows the use which may be made of this distinction. What a pity is it that we should have slooped forth so soon! how blind was it in so many other nations to imitate the defects, without making a proper use of that beautiful language which is now numbered among the dead!

22. After the verbs, the next most considerable variation we find between the *analogous* and *transpositive* languages is in the nouns; the latter varying the different cases of these by *inflection*; whereas the former expresses all the different variations of them by the help of other words prefixed, called *prepositions*. Now, if we consider the advantages or disadvantages of either of these methods under the same heads as we have done the verbs, we will find, that with regard to the first particular, *viz.* variety of sounds, almost the same remarks may be made as upon the verbs; for if we compare any particular noun by itself, the variety of sound appears much greater between the different cases in the *Transpositive*, than between the translation of

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these in the *Analogous* language. Thus, *rex, regis, Language. REGI, REGEM, &c.* are more distinct from one another in point of sound, than the translation of these, *a king, of a king, to a king, a king, &c.* But if we proceed one step further, and consider the variety which is produced in the language *in general*, by the one or the other of these methods, the case is entirely reversed. For as it would have been impossible to form distinct variations, different from one another, for each case of every noun, they have been obliged to reduce all their nouns into a few general classes, called *declensions*, and endowed all those included under each class with the same termination in every case; which produces a like similarity of sound with what we already observed was occasioned to the verbs from the same cause; whereas in the analogous languages, as there is no necessity for any constraint, there is almost as great a variety of sounds as there are of nouns. The Latins have only five different declensions; so that all the great number of words of this general order must be reduced to the very small diversity of sounds which these few classes admit of; and even the sounds of these few classes are not so much diversified as they might have been, as many of the different cases in the different declensions have exactly the same sounds, as we shall have occasion to remark more fully hereafter. We might here produce examples to shew the great similarity of sounds between different nouns in the Latin language, and variety in the English, in the same way as we did of the verbs: but that every reader in the least acquainted with these two languages can satisfy himself in this particular, without any further trouble than by marking down any number of Latin nouns, with their translations into English, we thought it unnecessary to dwell longer on this particular.

23. But if the inflection of nouns is a disadvantage to a language in point of diversity of sounds, it is very much the reverse with regard to the variety it allows in the arranging the words of the phrase. Here, indeed, the *Transpositive* language shines forth in all its glory, and the *Analogous* must yield the palm without the smallest dispute. For as the *nominative case* (or that noun which is the cause of that energy expressed by the verb) is different from the *accusative* (or that noun upon which the energy expressed by the verb is exerted), these may be placed in any situation that the writer shall think proper, without occasioning the smallest confusion: whereas in the analogous languages, as these two different states of the noun are expressed by the same word, they cannot be distinguished but by their position alone: so that the noun which is the efficient cause must always precede the verb, and that which is the active subject must follow; which greatly cramps the harmonious flow of composition.—Thus the Latins, without the smallest perplexity in the meaning, could say either *Brutum amavit Cassius*, or *Cassius amavit Brutum*, or *Brutum Cassius amavit*, or *Cassius Brutum amavit*. As the termination of the word *Cassius* always points out that it is in the *nominative case*, and therefore that he is the person from whom the energy proceeds; and in the same manner, as the termination of the word *Brutum* points out that it is in the *accusative case*, and consequently that he is the ob-

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verb can be made to assume, varying each of these in every way that it will admit, both as to the diversity of expression and the emphasis; he will soon be convinced that we have here said nothing more than enough.



Language. ject upon whom the energy is exerted; the meaning continues still distinct and clear, notwithstanding of all these several variations: whereas in the English language, we could only say *Cassius loved Brutus*, or, by a more forced phraseology, *Cassius Brutus loved*: Were we to reverse the case, as in the Latin, the meaning also would be reversed; for if we say *Brutus loved Cassius*, it is evident, that, instead of being the person beloved, as before, *Brutus* now becomes the person from whom the energy proceeds, and *Cassius* becomes the object beloved.—In this respect, therefore, the analogous languages are greatly inferior to the transpositive; and indeed it is from this single circumstance alone that they derive their chief excellence.

24. But although it thus appears evident, that any language, which has a particular variation of its nouns to distinguish the *accusative* from the *nominative case*, has an advantage over those languages which have none; yet it does not appear that any other of their *cases* adds to the variety, but rather the reverse: for, in Latin, we can only say *Amor Dei*; in English the same phrase may be rendered, either, —*the love of God*, —*of God the love*, —or, by a more forced arrangement, *God the love of*. And as these oblique cases, as the Latins called them, except the accusative, are clearly distinguished from one another, and from the nominative, by the preposition which accompanies them, we are not confined to any particular arrangement with regard to these as with the accusative, but may place them in what order we please, as in Milton's elegant invocation at the beginning of *Paradise Lost*:—

Of man's first disobedience, and the fruit  
Of that forbidden tree, whose mortal taste  
Brought death into the world, and all our wo,  
With loss of Eden, till one greater Man  
Restore us, and regain the blissful feat,  
Sing, heavenly Muse.

In this sentence the transposition is almost as great as the Latin language would admit of, and the meaning as distinct as if Milton had begun with the plain language of prose, thus,—"Heavenly muse, sing of man's first disobedience," &c.

Before we leave this head, we may remark, that the little attention which seems to have been paid to this peculiar advantage derived from the use of an accusative case different from the nominative, is somewhat surprising.—The Latins, who had more occasion to attend to this with care than any other nation, have in many cases overlooked it, as is evident from the various instances we meet with in their language where this is not distinguished. For all their nouns in *um* of the second declension, in *e* of the third, and in *u* of the fourth, have each their nominative and accusative singular alike. Nor in the plural is there any distinction between these two cases in those of the second declension ending in *um*, nor in all those of the third, fourth, and fifth, of every termination, the number of which is very considerable. So that their language reaps no advantage in this respect from almost one half of their nouns. Nor have any of the modern languages in Europe, however much they may have borrowed from the ancient languages in other respects, attempted to copy from them in this particular; from which perhaps more advantage would have been gained, than from copying all the o-

ther supposed excellencies of their language.—But to Language return to our subject.

25. It remains that we consider, whether the inflection of nouns gives any advantage over the method of defining them by prepositions, in point of distinctness and precision of meaning. — But in this respect, too, the analogous languages must come off victorious.—Indeed this is the particular in which their greatest excellence consists; nor was it, we believe, ever disputed, but that, in point of accuracy and precision, this method must excel all others, however it may be defective in other respects.—We observed under this head, when speaking of verbs, that it might perhaps be possible to form a language by inflection which should be capable of as great accuracy as in the more simple order of auxiliaries; but this would have been such an infinite labour, that it was not to be expected that ever human powers would have been able to accomplish it. More easy would it have been to have formed the several inflections of the nouns so different from one another, as to have rendered it impossible ever to mistake the meaning. Yet even this has not been attempted. And as we find that those languages which have adopted the method of inflecting their verbs are more imperfect in point of precision than the other, so the same may be said of inflecting the nouns: for, not to mention the energy which the analogous languages acquire by putting the accent upon the noun, or its preposition (when in an oblique case), according as the subject may require, to express which variation of meaning no particular variety of words have been invented in any inflected language, they are not even complete in other respects.—The Latin, in particular, is in many cases defective, the same termination being employed in many instances for different cases of the same noun.—Thus the genitive and dative singular, and nominative and vocative plural, of the first declension, are all exactly alike, and can only be distinguished from one another by the formation of the sentences;—as are also the nominative, vocative, and ablative singular, and the dative and ablative plural. In the second, the genitive singular, and nominative and vocative plural, are the same; as are also the dative and ablative singular, and dative and ablative plural; except those in *um*, whose nominative, accusative, and vocative singular, and nominative, accusative, and vocative plural, are alike. The other three declensions agree in as many of their cases as these do; which evidently tends to perplex the meaning, unless the hearer is particularly attentive to, and well acquainted with, the particular construction of the other parts of the sentence; all of which is totally removed, and the clearest certainty exhibited at once, by the help of prepositions in the analogous languages.

It will hardly be necessary to enter into such a minute examination of the advantages or disadvantages attending the variation of *adjectives*; as it will appear evident, from what has been already said, that the endowing them with terminations similar to, and corresponding with the nouns, must tend still more to increase the similarity of sounds in any language, than any of those particulars we have already taken notice of; and were it not for the liberty which they have, in transpositive languages, of separating the adjective from the noun, this must have occasioned such a jingle of similar sounds as could not fail to have been most



Language. disgusting to the ear; but as it would have been impossible in many cases, in those languages where the verbs and nouns are inflected, to have pronounced the words which ought to have followed each other, unless their adjectives could have been separated from the nouns; therefore, to remedy this inconvenience, they were forced to devise this unnatural method of inflecting them also; by which means it is easy to recognize to what noun any adjective has a reference, in whatever part of the sentence it may be placed.—In these languages, therefore, this inflection, both as to gender, number, and case, becomes absolutely necessary; and, by the diversity which it admitted in the arranging the words of the several phrases, might counterbalance the jingle of similar sounds which it introduced into the language.—But what shall we say of those European nations, who, although possessed of a language in every respect different from the transpositive idiom, have nevertheless adopted the variations of their adjectives in the fullest sense? for here they have nothing to counterbalance this disagreeable jingle of similar sounds, so destructive of all real harmony.—In the days of monkish ignorance, when this custom was probably introduced, the clashing of words with one another might be esteemed an ornament; but now that mankind have attained a higher sense of harmony and propriety, we in Britain may felicitate ourselves to find, that our language has escaped this mark of barbarity, to which so many others are now subjected.

26. Having thus examined the most striking particulars in which the transpositive and analogous languages differ, and endeavoured to show the general tendency of every one of the particulars separately, it would not be fair to dismiss the subject without considering each of these as a whole, and pointing out their general tendency in that light: for we all know, that it often happens in human inventions, that every part which composes a whole, taken separately, may appear extremely fine; and yet, when all these parts are put together, they may not agree, but produce a jarring and confusion very different from what we might have expected. We therefore imagine a few remarks upon the genius of each of these two distinct idioms of language considered as a whole will not be deemed useless.

Although all languages agree in this respect, that they are the means of conveying the ideas of one man to another; yet as there is an infinite variety of ways in which we might wish to convey these ideas, sometimes by the easy and familiar mode of conversation, and at other times by more solemn addresses to the understanding, by pompous declamation, &c. it may so happen, that the genius of one language may be more properly adapted to the one of these than the other, while another language may excel in the opposite particular. This is exactly the case in the two general idioms of which we now treat.—Every particular in a *transpositive* language, is peculiarly calculated for that solemn dignity which is necessary for pompous orations. Long sounding words, formed by the inflection of the different parts of speech,—flowing periods, in which the attention is kept awake by the harmony of the sounds, and an expectation of that word which is to unravel the whole,—if composed by a skilful artist, are admirably suited to that solemn dignity and awful grace which constitute the essence of a

public harangue. On the contrary, in private conversation, where the mind wishes to unbend itself with ease, these become so many clogs which encumber and perplex. At these moments we wish to transmute our thoughts with ease and facility—we are tired with every unnecessary syllable—and wish to be freed from the trouble of attention as much as may be. Like our state-robcs, we would wish to lay aside our pompous language, and enjoy ourselves at home with freedom and ease. Here the solemnity and windings of the *transpositive* language are burdensome; while the facility with which a sentiment can be expressed in the *analogous* language is the thing that we wish to acquire.—In this humble, though most engaging sphere, the *analogous* language moves unrivalled;—in this it wishes to indulge, and never tires. But it in vain attempts to rival the *transpositive* in dignity and pomp: The number of monosyllables interrupt the flow of harmony; and although they may give a greater variety of sounds, yet they do not naturally possess that dignified gravity which suits the other language. This, then, must be considered as the striking particular in the genius of these two different idioms, which marks their characters.

If we consider the effects which these two different characters of language must naturally produce upon the people who employ them, we will soon perceive, that the genius of the *analogous* language is much more favourable for the most engaging purposes of life, the civilizing the human mind by mutual intercourse of thought, than the *transpositive*. For as it is chiefly by the use of speech that man is raised above the brute creation;—as it is by this means he improves every faculty of his mind, and, to the observations which he may himself have made, has the additional advantage of the experience of those with whom he may converse, as well as the knowledge which the human race have acquired by the accumulated experience of all preceding ages;—as it is by the enlivening glow of conversation that kindred-souls catch fire from one another, that thought produces thought, and each improves upon the other, till they soar beyond the bounds which human reason, if left alone, could ever have aspired to;—we must surely consider that language as the most beneficial to society, which most effectually removes these bars that obstruct its progress. Now, the genius of the *analogous* languages is so easy, so simple and plain, as to be within the reach of every one who is born in the kingdom where it is used, to speak it with facility; even the rudest among the vulgar can hardly fall into any considerable grammatical errors: whereas, in the *transpositive* languages, so many rules are necessary to be attended to, and so much variation is produced in the meaning by the slightest variations in the sound, that it requires a study far above the reach of the illiterate mechanic ever to attain. So that, how perfect soever the language may be when spoken with purity, the bulk of the nation must ever labour under the inconvenience of rudeness and inaccuracy of speech, and all the evils which this naturally produces.—Accordingly, we find, that in Rome, a man, even in the highest rank, received as much honour, and was as much distinguished among his equals, for being able to converse with ease, as a modern author would be for writing in an easy

Language. and elegant style; and Cæsar among his contemporaries was as much esteemed for his superiority in speaking the language in ordinary conversation with ease and elegance, as for his powers of oratory, his skill in arms, or his excellence in literary composition. It is needless to point out the many inconveniences which this must unavoidably produce in a state. It is sufficient to observe, that it naturally tends to introduce a vast distinction between the different orders of men; to set an impenetrable barrier between those born in a high and those born in a low station; to keep the latter in ignorance and barbarity, while it elevates the former to such a height as must subject the other to be easily led by every popular demagogue.—How far the history of the nations who have followed this *idiom* of language confirms this observation, every one is left to judge for himself.

Having thus considered LANGUAGE in general, and pointed out the genius and tendency of the two most distinguished *idioms* which have prevailed; we shall close these remarks with a few observations upon the particular nature and genius of those languages which are now chiefly spoken or studied in Europe.

27. Of all the nations whose memory history has transmitted to us, none have been so eminently distinguished for their literary accomplishments, as well as acquaintance with the polite arts, as the Greeks; nor are we as yet acquainted with a language possessed of so many advantages, and so few defects, as that which they used, and which continues still to be known by their name.—The necessary connection between the progress of knowledge and the improvement of language has been already explained; so that it will not be surprising to find their progress in the one keep pace with that of the other: but it will be of utility to point out some advantages which that distinguished people possessed, which other nations, perhaps not less distinguished for talents or taste, have not enjoyed, which have contributed to render their language the most universally admired in ancient as well as in modern times.

As it is probable, that many different societies of men, in the early ages of antiquity, may have found themselves in such circumstances as to be obliged to invent a language to themselves; each would naturally adopt those sounds into their language which chance might suggest, or were most agreeable to their perception of harmony, or most consonant to the disposition of mind of the original inventors; in the same manner as we see that each composer of music has a particular species of sounds of which he is fonder than any other, which will predominate through all his compositions, and give them a certain characteristic tone by which they may be distinguished from that of other composers:—So the language of each particular set of people would have originally a certain characteristic tone of harmony, which would distinguish it from all others; and which would necessarily be more or less perfect, according to the greater or less degree of that delicate sense of harmony, distinguished by the name of *taste*, which these original inventors were possessed of. These sounds, then, being once established by custom, would become familiar to the ear of the descendants of these particular tribes: new words would be invented as knowledge increased; but it behoved these

to be modulated so as to be agreeable to the general tenor of their language, from the necessity of making it consonant as well to the organs of hearing as the organs of speech.—Hence it happens, that the characteristic tones of a language are preferred much longer without variation than any other particular relating to it; and if it change at all, the change must be slow and imperceptible. Knowledge after this may increase; taste may be improved: it may be perceived that the language is not copious enough to express the ideas, or not harmonious enough to please the ear of the composer;—he may readily invent words to supply the deficiency in that respect; but the sounds in a great measure remain without the reach of his power, and he must rest satisfied with these, such as they are, without attempting innovations.—Happy therefore, in this respect, must we deem those nations, whose earliest ancestors have been so fortunate as to adopt no unharmonious sounds into their language, whereby they are freed from one bar to the cultivating those refined pleasures which proceed from the use of a delicate taste, which others may perhaps never be able to surmount: and in this respect no nation was ever so eminently distinguished as the Greeks; which no doubt contributed its share to promote that general elegance and harmony of proportion which prevailed in all their arts. The original sounds and fundamental tones of that language are the most harmonious, and the most agreeable to the ear, of any that have hitherto been invented; inasmuch, that from this principle alone, the sound of their language is agreeable to every nation who has heard it, even when the meaning of the words are not understood; whereas almost all other languages, till they are understood, appear, to an ear which has not been accustomed to them, jarring and discordant. This is the fundamental excellence of that justly admired language; nor have the people failed to improve this to the utmost of their power, by many aids of their own invention. The Greek language is of the *transpositive* kind: but a people so lively, so acute, and so loquacious, could ill bear the ceremonious restraint to which that mode of language naturally subjected them; and have therefore, by various methods, freed it in a great measure from the stiffness which that produced. In inflecting their nouns and verbs, they sometimes prefix a syllable, and sometimes add one; which, besides the variety that it gives to the sounds of the language, adds greatly to the distinctness, and admits of a more natural arrangement of the words than in the Latin, and of consequence renders it much fitter for the easiness of private conversation: and indeed, the genius of the people so far prevailed over the *idiom* of the language, as to render it, in the age of its greatest perfection, capable of almost as much ease, and requiring almost as little transposition of words, as those languages which have been called analogous. But as those nations who spoke this language were all governed by popular assemblies, and as no authority could be obtained among them but by a skill in rhetoric and the powers of persuasion; it became necessary for every one, who wished to acquire power or consideration in the state, to improve himself in the knowledge of that language, in the use of which alone he could expect honours or reputation. Hence it happened, that while the vivacity of the people

Language. ple rendered it easy, the great men studiously improved every excellence that it could reap from its powers as a *transpositive* language; so that, when brought to its utmost perfection by the amazing genius of the great Demosthenes, it attained a power altogether unknown to any other language.—Thus happily circumstanced, the Greek language arrived at that envied pre-eminence which it still justly retains. From the progress of arts and sciences; from the gaiety and inventive genius of the people; from the number of free states into which Greece was divided, each of which invented words of its own, all of which contributed to the general stock; and from the natural communication which took place between these states, which excited in the strongest degree the talents of the people; it acquired a copiousness unknown to any ancient language, and excelled by few of the moderns.—In point of harmony of numbers, it is altogether unrivalled; and on account of the ease as well as dignity of which it admitted from the causes above assigned, it admits of perfection in a greater number of particular kinds of composition than any other language known.—The irresistible force and overwhelming impetuosity of Demosthenes seems not more natural to the genius of the language, than the more flowery charms of Plato's calm and harmonious cadences, or the unadorned simplicity of Xenophon; nor does the majestic pomp of Homer seem to be more agreeable to the genius of the language in which he wrote, than the more humble strains of Theocritus, or the laughing festivity of Anacreon: Equally adapted to all purposes, when we peruse any of these authors, we would imagine the language was most happily adapted for his particular style alone. The same powers it likewise, in a great measure, possessed for conversation; and the dialogue seems not more natural for the dignity of Sophocles or Euripides, than for the more easy tenderness of Menander, or buoyancy of Aristophanes.—With all these advantages, however, it must be acknowledged, that it did not possess that unexceptionable clearness of meaning which some analogous languages enjoy, or that characteristic force which the accent has power to give it, were not these defects counterbalanced by other causes which we shall afterwards point out.

28. The Romans, a people of fierce and warlike dispositions, for many ages during the infancy of their republic, more intent on pursuing conquests and military glory than in making improvements in literature or the fine arts, bestowed little attention to their language. Of a disposition less social or more phlegmatic than the Greeks, they gave themselves no trouble about rendering their language fit for conversation; and it remained strong and nervous, but, like their ideas, was limited and confined. More disposed to command respect by the power of their arms than by the force of persuasion, they despised the more effeminate powers of speech: so that, before the Punic wars, their language was perhaps more reserved and uncourtly than any other at that time known.—But after their rival Carthage was destroyed, and they had no longer that powerful curb upon their ambition; when riches flowed in upon them by the multiplicity of their conquests;—luxury began to prevail, the stern austerity of their manners to relax, and selfish ambition to take place of that disinterested love for their country fo

eminently conspicuous among all orders of men before Language. that period.—Popularity began then to be courted: ambitious men, finding themselves not possessed of that merit which insured them success with the virtuous senate, amused the mob with artful and seditious harangues; and by making them believe that they were possessed of all power, and had their sacred rights encroached upon by the senate, led them about at their pleasure, and got themselves exalted to honours and riches by these insidious arts. It was then the Romans first began to perceive the use to which a command of language could be put. Ambitious men then studied it with care, to be able to accomplish their ends; while the more virtuous were obliged to acquire a skill in this, that they might be able to repel the attacks of their adversaries.—Thus it happened, that in a short time that people, from having entirely neglected, began to study their language with the greatest assiduity; and as Greece happened to be subjected to the Roman yoke about that time, and a friendly intercourse was established between these two countries, this greatly conspired to nourish in the minds of the Romans a taste for that art of which they had lately become so much enamoured. Greece had, long before this period, been corrupted by luxury; their taste for the fine arts had degenerated into unnecessary refinement; and all their patriotism consisted in popular harangues and unmeaning declamation. Oratory was then studied as a refined art; and all the subtleties of it were taught by rule, with as great care as the gladiators were afterwards trained up in Rome. But while they were thus idly trying who should be the lord of their own people, the nerves of government were relaxed, and they became an easy prey to every invading power. In this situation they became the *subjects*, under the title of the *allies*, of Rome, and introduced among them the same taste for haranguing which prevailed among themselves. Well acquainted as they were with the powers of their own language, they set themselves with unwearied assiduity to polish and improve that of their new masters: but with all their assiduity and pains, they never were able to make it arrive at that perfection which their own language had acquired; and in the Augustan age, when it had arrived at the summit of its glory, Cicero bitterly complains of its want of copiousness in many particulars.

But as it was the desire of all who studied this language with care, to make it capable of that stately dignity and pomp necessary for public harangues, they followed the genius of the language in this particular, and in a great measure neglected those lesser delicacies which form the pleasure of domestic enjoyment; so that, while it acquired more copiousness, more harmony, and precision, it remained stiff and inflexible for conversation: nor could the minute distinction of nice grammatical rules be ever brought down to the apprehension of the vulgar; whence the language spoken among the lower class of people remained rude and unpolished even to the end of the monarchy. The Huns who over-run Italy, incapable of acquiring any knowledge of such a difficult and abstruse language, never adopted it; and the native inhabitants being made acquainted with a language more natural and easily acquired, quickly adopted that idiom of speech introduced



Language- introduced by their conquerors, although they still retained many of those words which the confined nature of the barbarian language made necessary to allow them to express their ideas.—And thus it was that the language of Rome, that proud mistress of the world, from an original defect in its formation, although it had been carried to a perfection in other respects far superior to any northern language at that time, easily gave way to them, and in a few ages the knowledge of it was lost among mankind : while, on the contrary, the more easy nature of the Greek language has still been able to keep some slight footing in the world, although the nations in which it has been spoken have been subjected to the yoke of foreign dominion for upwards of two thousand years, and their country has been twice ravaged by barbarous nations, and more cruelly depressed than ever the Romans were.

From the view which we have already given of the Latin language, it appears evident, that its idiom was more strictly transpositive than that of any other language yet known, and was attended with all the defects to which that idiom is naturally subjected : nor could it boast of such favourable alleviating circumstances as the Greek, the prevailing sounds of the Latin being far less harmonious to the ear : and although the formation of the words are such as to admit of full and distinct sounds, and so modulated as to lay no restraint upon the voice of the speaker ; yet, to a person unacquainted with the language, they do not convey that enchanting harmony so remarkable in the Greek language. The Latin is stately and solemn ; it does not excite disgust ; but at the same time it does not charm the ear, so as to make it listen with delighted attention. To one acquainted with the language indeed, the nervous boldness of the thoughts, the harmonious rounding of the periods, the full solemn swelling of the sounds, so distinguishable in the most eminent writers in that language which have been preserved to us, all conspire to make it pleasing and agreeable.—In these admired works we meet with all its beauties, without perceiving any of its defects ; and we naturally admire, as perfect, a language which is capable of producing such excellent works.—Yet with all these seeming excellencies, this language is less copious, and more limited in its style of composition, than many modern languages ; far less capable of precision and accuracy than almost any of these ; and infinitely behind them all in point of easiness in conversation. But these points have been so fully proved already, as to require no further illustration.—Of the compositions in that language which have been preserved to us, the *orations* of Cicero are best adapted to the genius of the language, and we there see it in its utmost perfection. In the *philosophical works* of that great author we perceive some of its defects ; and it requires all the powers of that great man to render his *epistles* agreeable, as these have the genius of the language to struggle with.—Next to oratory, history agrees with the genius of this language ; and Cæsar, in his *Commentaries*, has exhibited the language in its purest elegance, without the aid of pomp or foreign ornament.—Among the poets, Virgil has best adapted his words to his language. The flowing harmony and pomp of it is well adapted for the epic strain, and

the correct delicacy of his taste rendered him perfectly equal to the task. But Horace is the only poet whose force of genius was able to overcome the bars which the language threw in his way, and succeed in lyric poetry. Were it not for the brilliancy of the thoughts, and acuteness of the remarks, which so eminently distinguish this author's compositions, his odes would long ere now have sunk into utter oblivion.—But so conscious have all the Roman poets been of the unfitness of their language for easy dialogue, that almost none of them, after Plautus and Terence, have attempted any dramatic compositions in that language.—Nor have we any reason to regret that they neglected this branch of poetry, as it is probable, if they had ever become fond of these, they would have been obliged to have adopted so many unnatural contrivances to render them agreeable, as would have prevented us (who of course would have considered ourselves as bound to follow them) from making that progress in the drama which so particularly distinguishes the productions of modern times.

29. The modern Italian language, from an inattention too common in literary subjects, has been usually called a *child of the Latin language*, and is commonly believed to be the ancient Latin a little debased by the mixture of the barbarous language of those people who conquered Italy. The truth is, the case is directly the reverse : for this language, in its general idiom and fundamental principles, is evidently of the analogous kind, first introduced by those fierce invaders, altho' it has borrowed many of its words, and some of its modes of phraseology, from the Latin, with which they were so intimately blended that this could scarcely be avoided ; and it has been from remarking this slight connection so obvious at first sight, that superficial observers have been led to draw this general conclusion, so contrary to fact.

When Italy was over-run with the Lombards, and the empire destroyed by these northern invaders, they, as conquerors, continued to speak their own native language. Fierce and illiterate, they would not stoop to the servility of studying a language so clogged with rules, and difficult of attainment, as the Latin would naturally be to a people altogether unacquainted with nice grammatical distinctions : while the Romans of necessity were obliged to study the language of their conquerors, as well to obtain some relief of their grievances by prayers and supplications, as to destroy that odious distinction which subsisted between the conquerors and conquered while they continued as distinct people. As the language of their new masters, although rude and confined, was natural in its order, and easy to be acquired, the Latins would soon attain a competent skill in it : and as they bore such a proportion to the whole number of people, the whole language would partake somewhat of the general sound of the former : for, in spite of all their efforts to the contrary, the organs of speech could not at once be made to acquire a perfect power of uttering any unaccustomed sounds ; and as it behoved the language of the barbarians to be much less copious than the Latin, whenever they found themselves at a loss for a word, they would naturally adopt those which most readily presented themselves from their new subjects. Thus a language in time was formed, somewhat resembling

sembling the Latin, both in the general tenor of the sounds, and in the meaning of many words: and as the barbarians gave themselves little trouble about language, and in some cases perhaps hardly knew the general analogy of their own language, it is not surprising if their new subjects should find themselves sometimes at a loss on that account, or if, in these situations, they followed, on some occasions, the analogy suggested to them by their own: which accounts for the strange degree of mixture of heterogeneous grammatical analogy we meet with in the Italian as well as Spanish and French languages.—The idiom of all the Gothic languages is purely analogous; and in all probability, before their mixture with the Latins and other people in their provinces, the several grammatical parts of speech followed the plain simple idea which that supposes: the verbs and nouns were all probably varied by auxiliaries, and their adjectives retained their simple unalterable state:—but by their mixture with the Latins, this simple form has been in many cases altered; their verbs became in some cases inflected; but their nouns in all these languages still retained their original form; although they have varied their adjectives, and foolishly clogged their nouns with gender, according to the Latin idioms. From this heterogeneous and fortuitous (as we may say, because injudicious) mixture of parts, results a language possessing almost all the defects of each of the languages of which it is composed, with few of the excellencies of either: for it has neither the ease and precision of the *analogous* nor the pomp and boldness of the *transpositive* languages; at the same time that it is clogged with almost as many rules, and liable to as great abuses.

30. These observations are equally applicable to the French and Spanish, as to the Italian language.—With regard to this last in particular, we may observe, that as the natural inhabitants of Italy, before the last invasion of the barbarians, were sunk and enervated by luxury, and that by depression of mind and genius which anarchy always produces, they had become fond of feasting and entertainments, and the enjoyment of sensual pleasures constituted their highest delight; and their language partook of the same debility as their body.—The barbarians too, unaccustomed to the seductions of pleasure, soon fell from their original boldness and intrepidity, and, like Hannibal's troops of old, were enervated by the sensual gratifications in which a nation of conquerors unaccustomed to the restraint of government freely indulged. The softness of the air,—the fertility of the climate,—the unaccustomed flow of riches which they at once acquired,—together with the voluptuous manner of their conquered subjects,—all conspired to enervate their minds, and render them soft and effeminate. No wonder then, if a language new-moulded at this juncture should partake of the genius of the people who formed it; and, instead of participating of the martial boldness and ferocity of either of their ancestors, should be softened and enfeebled by every device which an effeminate people could invent.—The strong consonants which terminated the words, and gave them life and boldness, being thought too harsh for the delicate ears of these sons of sloth, were banished their language; while sonorous vowels, which

could be protracted to any length in music, were substituted in their stead.—Thus the Italian language is formed flowing and harmonious, but destitute of those nerves which constitute the strength and vigour of a language: at the same time, the sounds are neither enough diversified, nor in themselves of such an agreeable tone, as to afford great pleasure without the aid of musical notes;—and the small pleasure which this affords is still lessened by the little variety of measure which the great familiarity of the terminations of the words occasions. Hence it happens, that this language is fitted for excelling in fewer branches of literature than almost any other: and although we have excellent historians, and more than ordinary poets, in Italian, yet they labour under great inconveniences, from the language wanting nerves and stateliness for the former, and sufficient variety of modulation for the latter. It is, more particularly on this account, altogether unfit for an epic poem: and though attempts have been made in this way by two men whose genius, if not fettered by the language, might have been crowned with success; yet these, notwithstanding the fame that with some they may have acquired, must, in point of poetic harmony, be deemed defective by every impartial person. Nor is it possible that a language which hardly admits of poetry without rhyme, can ever be capable of producing a perfect poem of great length; and the stanza to which their poets have ever confined themselves, must always produce the most disagreeable effect in a poem where unrestrained pomp or pathos are necessary qualifications. The only species of poetry in which the Italian language can claim a superior excellence, is the tender tone of elegy: and here it remains unrivalled and alone; the plaintive melody of the sounds, and smooth flow of the language, being perfectly adapted to express that soothing melancholy which this species of poetry requires. On this account the plaintive scenes of the *Pastor Fido* of *Guarini* have justly gained to that poem an universal applause; although, unless on this account alone, it is perhaps inferior to almost every other poem of the kind which ever appeared.—We must observe with surprise, that the Italians, who have fettered every other species of poetry with the severest shackles of rhyme, have in this species showed an example of the most unrestrained freedom; the happy effects of which ought to have taught all Europe the powerful charms attending it: yet with amazement we perceive, that scarce an attempt to imitate them has been made by any poet in Europe except by Milton in his *Lycidas*; no dramatic poet, even in Britain, having ever adopted the unrestrained harmony of numbers to be met with in this and many other of their best dramatic compositions.

Of all the languages which sprung up from the mixture of the Latins with the northern people on the destruction of the Roman empire, none of them approach so near to the genius of the Latin as the Spanish does. For as the Spaniards have been always remarkable for their military proofs and dignity of mind, their language is naturally adapted to express ideas of that kind. Sonorous and solemn, it admits nearly of as much dignity as the Latin. For conversation, it is the most elegant and courteous language in Europe.

The humane and generous order of chivalry was first  
in.

Language. invented, and kept its footing longest, in this nation; and although it run at last into such a ridiculous excess as deservedly made it fall into universal disrepute, yet it left such a strong tincture of romantic heroism upon the minds of all ranks of people, as made them jealous of their glory, and strongly emulous of cultivating that heroic politeness, which they considered as the highest perfection they could attain. Every man disdained to flatter, or to yield up any point of honour which he possessed: at the same time, he rigorously exacted from others all that was his due. These circumstances have given rise to a great many terms of respect, and courteous condescension, without meanness or flattery, which give their dialogue a respectful politeness and elegance unknown to any other European language. This is the reason why the characters so finely drawn by Cervantes in *Don Quixote* are still unknown to all but those who understand the language in which he wrote. Nothing can be more unlike the gentle meekness and humane heroism of the knight, or the native simplicity, warmth of affection, and respectful loquacity of the squire, than the inconsistent follies of the one, or the impertinent forwardness and disrespectful petulance of the other, as they are exhibited in every English translation. Nor is it, as we imagine, possible to represent so much familiarity, united with such becoming condescension in the one, and unfeigned deference in the other, in any other European language, as is necessary to paint these two admirable characters.

Although this language, from the solemn dignity and majestic elegance of its structure, is perhaps better qualified than any other modern one for the sublime strains of epic poetry; yet as the poets of this nation have all along imitated the Italians by a most servile subjection to rhyme, they never have produced one poem of this sort, which in point of poetry of style deserves to be transmitted to posterity. And in any other species of poetry but this, or the higher tragedy, it is not naturally fitted to excel. But although the drama and other polite branches of literature were early cultivated in this country, and made considerable progress in it, before the thirst of gain debased their souls, or the desire of universal dominion made them forget that liberty which they once so much prized; since they became enervated by an overbearing pride, and their minds enslaved by superstition; all the polite arts have been neglected: so that, while other European nations have been advancing in knowledge, and improving their language, they have remained in a state of torpid inactivity; and their language has not arrived at that perfection which its nature would admit, or the acute genius of the people might have made us naturally expect.

31. It will perhaps, by some, be thought an unpardonable insult, if we do not allow the French the preference of all modern languages in many respects. But so far must we pay a deference to truth, as to be obliged to rank it among the poorest languages in Europe. Every other language has some sounds which can be uttered clearly by the voice: even the Italian, although it wants energy, still possesses distinctness of articulation. But the French is almost incapable of either of these beauties; for in that language the vow-

els are so much curtailed in the pronunciation, and the words run into one another in such a manner, as necessarily to produce an indistinctness which renders it incapable of measure or harmony. From this cause, it is in a great measure incapable of poetic modulation, and rhyme has been obliged to be substituted in its stead; so that this poorest of all contrivances which has ever yet been invented to distinguish poetry from prose, admitted into all the modern languages when ignorance prevailed over Europe, has still kept some footing in the greatest part of these, rather through a deference for established customs, than from any necessity. Yet as the French language admits of so little poetic modulation, rhyme is in some measure necessary to it; and therefore this poor deviation from prose has been adopted by it, and dignified with the name of *Poetry*. But by their blind attachment to this artifice, the French have neglected to improve so much as they might have done the small powers for harmony of which their language is possessed; and by being long accustomed to this false taste, have become fond of it to such a ridiculous excess, as to have all their tragedies, nay even their comedies, in rhyme. While the poet is obliged to enervate his language, and check the flow of composition, for the sake of linking his lines together, the judicious actor finds more difficulty in destroying the appearance of that measure, and preventing the clinking of the rhymes, than in all the rest of his task.—After this, we will not be surprised to find Voltaire attempt an epic poem in this species of poetry; although the more judicious Fenelon in his *Telemaque* had shown to his countrymen the only species of poetry that their language could admit of for any poem which aspired to the dignity of the epic strain.—Madam Deshoulières, in her *Idylle*, has shewn the utmost extent of harmony to which their language can attain in smaller poems: indeed in the tenderness of an elegy, or the gaiety of a song, it may succeed; but it is so destitute of force and energy, that it can never be able to reach the pindaric, or even perhaps the lyric strain,—as the ineffectual efforts even of the harmonious Rousseau, in his translation of the psalms of David of this stamp, may fully convince us.

With regard to its powers in other species of composition, the sententious rapidity of Voltaire, and the more nervous dignity of Rousseau, afford us no small presumption, that, in a skilful hand, it might acquire so much force, as to transmit to futurity historical facts in a style not altogether unworthy of the subject. In attempts at pathetic declamation, the superior abilities of the composer may perhaps on some occasions excite a great idea, but this is ever cramped by the genius of the language: and although no nation in Europe can boast of so many orations where this grandeur is attempted; yet perhaps there are few who cannot produce more perfect, although not more laboured, compositions of this kind.

But notwithstanding the French language labours under all these inconveniences; although it can neither equal the dignity or genuine politeness of the Spanish, the nervous boldness of the English, nor the melting softness of the Italian; although it is destitute of poetic harmony, and so much cramped in sound as to be absolutely unfit for almost every species of musical



fical composition (A); yet the sprightly genius of that volatile people has been able to surmount all these difficulties, and render it the language most generally esteemed, and most universally spoken, of any in Europe: for this people, naturally gay and loquacious, and fond to exceed of those superficial accomplishments which engage the attention of the fair sex, have invented such an infinity of words capable of expressing vague and unmeaning compliment, now dignified by the name of *politeness*, that, in this strain, one who uses the French can never be at a loss; and as it is easy to converse *more*, and really *very less*, in this than in any other language, a man of very moderate talents may distinguish himself much more by using this than any other that has ever yet been invented. On this account, it is peculiarly well adapted for that species of conversation which must ever take place in those general and promiscuous companies, where many persons of both sexes are met together for the purposes of relaxation or amusement; and must of course be naturally admitted into the courts of princes, and assemblies of great personages; who, having fewer equals with whom they can associate, are more under a necessity of conversing with strangers, in whose company the tender stimulus of friendship does not so naturally expand the heart to mutual trust or unrestrained confidence. In these circumstances, as the heart remaineth disengaged, conversation must necessarily flag; and mankind in this situation will gladly adopt that language in which they can converse most easily without being deeply interested. On these accounts the French now is, and probably will continue to be reckoned the most polite language in Europe, and therefore the most generally studied and known: nor should we envy them this distinction, if our countrymen would not weaken and enervate their own manly language, by adopting too many of their unmeaning phrases.

32. The English is perhaps possessed of a greater degree of excellence, blended with a greater number of defects, than any of the languages we have hitherto mentioned. As the people of Great Britain are a bold, daring, and impetuous race of men; subject to strong passions, and, from the absolute freedom and independence which reigns among all ranks of people throughout this happy isle, little solicitous about controlling these passions;—our language takes its strongest characteristic distinction from the genius of the people; and, being bold, daring, and abrupt, is admirably well adapted to express those great emotions which spring up in an intrepid mind at the prospect

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of interesting events. Particularly happy too in the full and open sound of the vowels, which forms the characteristic *tone* of the language, and in the strong use of the aspirate H in almost all those words which are used as exclamations, or marks of strong emotions upon interesting occasions, that particular class of words called *interjections* have, in our language, more of that fulness and unrestrained freedom of tones, in which their chief power consists, and are pushed forth from the inmost recesses of the soul in a more forcible and unrestrained manner, than any other language whatever. Hence it is more peculiarly adapted for the great and interesting scenes of the *drama* than any language that has yet appeared in the globe. Nor has any other nation ever arrived at that perfection which the English may justly claim in that respect; for however faulty our dramatic compositions may be in some of the critical niceties which relate to this art,—in nervous force of diction, and in the natural expression of those great emotions which constitute its soul and energy, we claim, without dispute, an unrivalled superiority. Our language too, from the great intercourse that we have had with almost all the nations of the globe by means of our extensive commerce, and from the eminent degree of perfection which we have attained in all the arts and sciences, has acquired a copiousness beyond what any other modern nation can lay claim to; and even the most partial favourers of the Greek language are forced to acknowledge, that in this respect it must give place to the English. Nor is it less happy in that facility of construction which renders it more peculiarly adapted to the genius of a free people, than any other form of language. Of an *idiom* purely analogous, it has deviated less from the genius of that *idiom*, and possesses more of the characteristic advantages attending it, than any other language that now exists: for, while *others*, perhaps by their more intimate connection with the Romans, have adopted some of their transpositions, and clogged their language with unnecessary fetters, *we* have preserved ourselves free from the contagion, and still retain the primitive simplicity of our language. Our *verbs* are all varied by auxiliaries (except in the instance we have already given, which is so much in our favours); our *nouns* remain free from the perplexing embarrassment of *genders*, and our pronouns mark this distinction where necessary with the most perfect accuracy; our *articles* also are of course freed from this unnatural encumbrance, and our *adjectives* preserve their natural freedom and independence. From these causes, our language follows an order of construction

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(A) An author of great discernment, and well acquainted with the French language, has lately made the same remark; and as the loftiness of his genius often prevents him from bringing down his illustrations to the level of ordinary comprehension, he has on this, and many other occasions, been unjustly accused of being fond of paradoxes.---But as music never produces its full effect but when the tones it assumes are in unison with the idea that the words naturally excite, it of necessity follows, that if the words of any language do not admit of that fulness of sound, or of that species of tones, which the passion or affection that may be described by the words would naturally require to excite the same idea in the mind of one who was unacquainted with the language, it will be impossible for the music to produce its full effect, as it will be cramped and confined by the sound of the words;—and as the French language does not admit of those full and open sounds which are necessary for pathetic expression in music, it must of course be unfit for musical composition.---It is true indeed, that in modern times, in which so little attention is bestowed on the simple and sublime charms of pathetic expression, and a fantastical tingling of unmeaning sounds is called *music*—where the sense of the words are lost in fugues, quavers, and unnecessary repetition of particular syllables,---all languages are nearly fitted for it; and among these the French: nor is it to be doubted, that, in the easy gaiety of a song, this language can properly enough admit of all the musical expression which that species of composition may require.

Language. so natural and easy, and the rules of *syntax* are so few and obvious, as to be within the reach of the most ordinary capacity. So that from this, and the great clearness and distinctness of meaning with which this mode of construction is necessarily accompanied, it is much better adapted for the familiar intercourse of private society, and liable to fewer errors in using it, than any other language yet known; and on this account we may boast, that in no nation of Europe do the lower class of people speak their language with so much accuracy, or have their minds so much enlightened by knowledge, as in Great Britain.—What then shall we say of the discernment of those grammarians, who are every day echoing back to one another complaints of the poverty of our language on account of the few and simple rules which it requires in *syntax*? As justly might we complain of an invention in mechanics, which, by means of one or two simple movements, obvious to an ordinary capacity, little liable to accidents, and easily put in order by the rudest hand, should possess the whole powers of a complex machine, which had required an infinite apparatus of wheels and contrary movements, the knowledge of which could only be acquired, or the various accidents to which it was exposed by using it be repaired, by the powers of an ingenious artist, as complain of this characteristic excellence of our language as a defect.

But if we thus enjoy in an eminent degree the advantages attending an *analogous* language, we likewise find in a considerable measure the defects to which it is exposed; as the number of monosyllables with which it always must be embarrassed, notwithstanding the great improvements which have been made in our language since the revival of letters in Europe, prevents in some degree that swelling fulness of sound which so powerfully contributes to harmonious dignity and graceful cadences in literary compositions. And as the genius of the people of Britain has always been more disposed to the rougher arts of command than to the softer insinuations of persuasion, no pains have been taken to correct these natural defects of our language; but, on the contrary, by an inattention of which we have hardly a parallel in the history of any civilized nation, we meet with many instances, even within this last century, of the harmony of sound being sacrificed to that brevity so desirable in conversation, as many elegant words have been curtailed, and harmonious syllables suppressed, to substitute in their stead others, shorter indeed, but more barbarous and uncouth. Nay, so little attention have our forefathers bestowed upon the harmony of sounds in our language, that one would be tempted to think, on looking back to its primitive state, that they had on some occasions rudely abused it. Our language, at its first formation, seems to have laboured under a capital defect in point of sound, as such a number of *S's* enter into the formation of our words, and such a number of letters and combinations of other letters assume a similar sound, as to give a general hiss through the whole tenor of our language, which must be exceedingly disagreeable to every unprejudiced ear. We would therefore have naturally expected, that at the revival of letters, when our forefathers became acquainted with the harmonious languages of Greece and Rome, they would have

acquired a more correct taste, and endeavoured, if possible, to have diminished the prevalence of this disgusting sound. But so far have they been from thinking of this, that they have multiplied this letter exceedingly. The plurals of almost all our nouns were originally formed by adding the harmonious syllable *en* to the singular, which has given place to the letter *s*; and instead of *housen* formerly, we now say *houses*. In like manner, many of the variations of our verbs were formed by the syllable *eth*, which we have likewise changed into the same disagreeable letter; so that, instead of *loveth, moveth, writeth, walketh*, &c. we have changed them into the more modish form of *loves, moves, writes, walks*, &c. Our very auxiliary verbs have suffered the same change; and instead of *hath and doth*, we now make use of *has and does*. From these causes, notwithstanding the great improvements which have been made in language, within these few centuries, in other respects; yet, with regard to the pleasantness of sound alone, it was perhaps much more perfect in the days of Chaucer than at present: and although custom may have rendered these sounds so familiar to our ear, as not to affect us much; yet to an unprejudiced person, unacquainted with our language, we have not the smallest doubt, but the language of *Bacon* or *Sidney* would appear more harmonious than that of *Robertson* or *Hume*. This is indeed the fundamental defect of our language, and loudly calls for reformation.

But notwithstanding this great and radical defect with regard to pleasantness of sounds, which must be so strongly perceived by every one who is unacquainted with the meaning of our words; yet to those who understand the language, the exceeding copiousness which it allows in the choice of words proper for the occasion, and the nervous force which it derives from the accent, with the perspicuity and graceful elegance the emphasis bestows upon it, makes this defect be totally overlooked; and we could produce such numerous works of prose which excel in almost every different style of composition as would be tire some to enumerate: every reader of taste and discernment will be able to recollect a sufficient number of writings which excel in point of style, between the graceful and becoming gravity so conspicuous in all the works of the author of the *Whole Duty of Man*, and the animated and nervous diction of Robertson in his history of Charles the Fifth,—the more flowery style of Shaftesbury, or the Attic simplicity and elegance of Addison. But although we can equal, if not surpass, every modern language in works of prose, it is in its poetical powers that our language shines forth with the greatest lustre. The brevity to which we must here necessarily confine ourselves, prevents us from entering into a minute examination of the poetical powers of our own, compared with other languages: otherwise it would be easy to shew, that every other modern language labours under great restraints in this respect which ours is freed from;—that our language admits of a greater variety of poetic movements, and diversity of cadence, than any of the admired languages of antiquity;—that it distinguishes with the greatest accuracy between accent and quantity, and is possessed of every other poetic excellence which their languages were capable of: so that we

are possessed of all the sources of harmony which they could boast; and, besides all these, have one super-added, which is the cause of greater variety and more forcible expression in numbers than all the rest; that is, the unlimited power given by the emphasis over quantity and cadence; by means whereof, a necessary union between sound and sense, numbers and meaning, in verification, unknown to the ancients, has been brought about, which gives our language in this respect a superiority over all those justly admired languages. But as we cannot here further pursue this subject, we shall only observe, that these great and distinguishing excellencies far more than counter-balance the inconveniences that we have already mentioned: and although, in mere pleasantness of sounds, or harmonious flow of syllables, our language may be inferior to the Greek, the Latin, Italian, and Spanish; yet in point of many dignity, graceful variety, intuitive distinctness, nervous energy of expression, unconstrained freedom and harmony of poetic numbers, it will yield the palm to none. Our immortal Milton, slowly rising, in graceful majesty stands up as equal, if not superior in these respects to any poet, in any other language, that ever yet existed;—while Thomson, with more humble aim, in melody more smooth and flowing, softens the soul to harmony and peace:—the plaintive moan of Hammond, calls forth the tender tear and sympathetic sigh; while Gray's more soothing melancholy fixes the sober mind to silent contemplation:—more tender still than these, the amiable Shenstone comes; and from his Doric reed, still free from courtly affectation, flows a strain so pure, so simple, and of such tender harmony, as even Arcadian shepherds would be proud to own. But far before the rest, the daring Shakespeare steps forth conspicuous, clothed in native dignity; and, pressing forward with unremitting ardour, boldly lays claim to both dramatic crowns held out to him by Thalia and Melpomene:—his rivals, far behind, look up, and envy him for these un fading glories; and the astonished nations round, with distant awe, behold and tremble at his daring sight.——Thus the language, equally obedient to all, bends with ease under their hands, whatever form they would have it assume; and, like the yielding wax, readily receives, and faithfully transmits to posterity, those impressions which they have stamped upon it.

Such are the principal outlines of the language of Great Britain, such are its beauties, and such its most capital defects; a language more peculiarly circumstanced than any that has ever yet appeared.——It is the language of a great and powerful nation, whose fleets surround the globe, and who semerchants are in every port; a people admired or revered by all the world:—and yet it is less known in every foreign country, than any other language in Europe.——In it are written more perfect treatises on every art and science, than are to be found in any other language;—yet it is less sought after or esteemed by the literati in any part of the globe, than almost any of these. Its superior powers for every purpose of language are sufficiently obvious from the models of perfection, in almost every particular, which can be produced in it:—yet it is neglected, despised, and vilified by the people who use it; and many of those authors who owe al-

most the whole of their fame to the excellence of the language in which they wrote, look upon that very language with the highest contempt.——Neglected and despised, it has been trodden under foot as a thing altogether unworthy of cultivation or attention. Yet in spite of all these inconveniences, in spite of the many wounds it has thus received, it still holds up its head, and preserves evident marks of that comeliness and vigour which are its characteristic distinction. Like a healthy oak planted in a rich and fertile soil, it has sprung up with vigour: and although neglected, and suffered to be over-run with weeds; although exposed to every blast, and unprotected from every violence; it still beareth up under all these inconveniences, and shoots up with a robust healthiness and wild luxuriance of growth. Should this plant, so sound and vigorous, be now cleared from those weeds with which it has been so much encumbered;—should every obstacle which now buries it under thick shades, and hides it from the view of every passenger, be cleared away;—should the soil be cultivated with care, and a strong fence be placed around it, to prevent the idle or the wicked from breaking or distorting its branches;—who can tell with what additional vigour it would flourish, or what amazing magnitude and perfection it might at last attain!—How would the astonished world behold, with reverential awe, the majestic gracefulness of that object which they so lately despised!

*Beauty of LANGUAGE considered in regard to Composition.* The beauties of language may be divided into three classes: 1. Those which arise from sound; 2. Those which respect significance; 3. Those derived from a resemblance between sound and signification.

1. *With respect to sound.* In a cursory view, one would imagine, that the agreeableness or disagreeableness of a word with respect to sound, should depend upon the agreeableness or disagreeableness of its component syllables: which is true in part, but not entirely; for we must also take under consideration the effect of syllables in succession. In the first place, syllables in immediate succession, pronounced, each of them, with the same, or nearly the same aperture of the mouth, produce a succession of weak and feeble sounds; witness the French words *dit-il, pathétique*: on the other hand, a syllable of the greatest aperture succeeding one of the smallest, or the contrary, makes a succession, which, because of its remarkable disagreeableness, is distinguished by a proper name, viz. *hiatus*. The most agreeable succession is, where the cavity is increased and diminished alternately, within moderate limits: examples, *Alternative, longevity, pusillanimous*. Secondly, words consisting wholly of syllables pronounced slow, or of syllables pronounced quick, commonly called *long* and *short syllables*, have little melody in them; witness the words *petitioner, fruiterer, dizziness*: on the other hand, the intermixture of long and short syllables is remarkably agreeable; for example, *degree, repent, wonderful, altitude, rapidly, independent, impetuosity*; the cause of which is explained in POETRY, Part II.

To proceed to the music of periods. As the arrangement of words in succession, so as to afford the greatest pleasure to the ear, depends on principles re-



Language. mote from common view, it will be necessary to pre-  
 mise some general observations upon the appearance  
 that objects make when placed in an increasing or de-  
 creasing series; which appearance will vary according  
 to the prevalence of resemblance or of contrast. Where  
 the objects vary by small differences so as to have a  
 mutual resemblance, we in ascending conceive the  
 second object of no greater size than the first, the  
 third of no greater size than the second, and so of the  
 rest; which diminisheth in appearance the size of every  
 object except the first: but when, beginning at the  
 greatest object, we proceed gradually to the least,  
 resemblance makes us imagine the second as great as  
 the first, and the third as great as the second; which  
 in appearance magnifies every object except the first.  
 On the other hand, in a series varying by large dif-  
 ferences, where contrast prevails, the effects are di-  
 rectly opposite: a great object succeeding a small one  
 of the same kind, appears greater than usual; and a  
 little object succeeding one that is great, appears less  
 than usual\*. Hence a remarkable pleasure in view-  
 ing a series ascending by large differences; directly  
 opposite to what we feel when the differences are small.  
 The least object of a series ascending by large differ-  
 ences has the same effect upon the mind as if it stood  
 single without making a part of the series: but the  
 second object, by means of contrast, appears greater  
 than when view'd apart; and the same effect is per-  
 ceived in ascending progressively, till we  
 arrive at the last object. The opposite effect is pro-  
 duced in descending; for in this direction, every ob-  
 ject, except the first, appears less than when viewed  
 separately and independent of the series. We may  
 then assume as a maxim, which will hold in the com-  
 position of language as well as of other subjects, That  
 a strong impulse succeeding a weak, makes a double  
 impression on the mind; and that a weak impulse  
 succeeding a strong, makes scarce any impression.

\* See Re-  
 semblance.

† De struct.  
 perfectæ  
 erat. lib. ii.

After establishing this maxim, we can be at no loss  
 about its application to the subject in hand. The  
 following rule is laid down by Diomedes †. "In verbis  
 observandum est, ne a majoribus ad minora descendat  
 oratio; melius enim dicitur, *Vir est optimus*, quam,  
*Vir optimus est*." This rule is also applicable to en-  
 tire members of a period, which, according to our au-  
 thor's expression, ought not, more than single words,  
 to proceed from the greater to the less, but from the  
 less to the greater. In arranging the members of a  
 period, no writer equals Cicero: The following ex-  
 amples are too beautiful to be flurled over by a re-  
 fference.

Quicum quæstor fueram,  
 Quicum me fors consuetudoque majorum,  
 Quicum me deorum hominumque iudicium conjunxerat.

Again:

Habet honorem quem petimus,  
 Habet spem quam præpositam nobis habemus,  
 Habet exultationem, multo sudore, labore, vigi-  
 liisque, collectam.

Again:

Eripite nos ex miseriis,  
 Eripite nos ex faucibus eorum,

Quorum crudelitas nostro languine non potest expleri. Language.  
 De oratore, l. i. § 52.

This order of words or members gradually increasing  
 in length, may, so far as concerns the pleasure of sound,  
 be denominated a *climax in sound*.

With respect to the music of periods as united in a  
 discourse, this depends chiefly on variety. Hence a  
 rule for arranging the members of different periods  
 with relation to each other, That to avoid a tedious  
 uniformity of sound and cadence, the arrangement, the  
 cadence, and the length of the members, ought to be  
 diversified as much as possible: and if the members of  
 different periods be sufficiently diversified, the periods  
 themselves will be equally so.

II. *With respect to signification.* The beauties of  
 language with respect to signification, may not im-  
 properly be distinguished into two kinds: first, the  
 beauties that arise from a right choice of words or ma-  
 terials for constructing the period; and next, the beau-  
 ties that arise from a due arrangement of these words  
 or materials.

1. Communication of thought being the chief end  
 of language, it is a rule, That peripety ought not  
 to be sacrificed to any other beauty whatever. No-  
 thing therefore in language ought more to be studied,  
 than to prevent all obscurity in the expression; for to  
 have no meaning, is but one degree worse than to  
 have a meaning that is not understood. We shall here  
 give a few examples where the obscurity arises from a  
 wrong choice of words.

Livy, speaking of a rout after a battle, "Multique  
 in ruina *maiore* quam fuga oppressi obruncatque."  
 This author is frequently obscure by expressing but  
 part of his thought, leaving it to be completed by his  
 reader. His description of the sea-fight, l. 28. cap. 30.  
 is extremely perplexed.

Unde tibi reditum certo subtemine Parcae  
 Rupere. Hor.

Qui peræpe cava testudine flevit amorem,  
 Non elaboratum ad pedem. Id.

Me fabulose Vulture in Appulo,  
 Altricie extra limæ Apulie,  
 Ludo, fatigatunque somno,  
 Fionde nova puerum palumbes  
 Texere. Id.

Poræ rivus aquæ, silvaque jugerum  
 Paucorum, et segetis certa fides meæ,  
 Fulgentem imperio fertilis Africæ  
 Pallis sorte beator. Id.

Cum fas atque nefas exiguo sine libidinum  
 Discernant avidi. Id.

Ac spem fronte serenat. Virg.

The rule next in order is, That the language bought  
 to correspond to the subject: heroic actions or senti-  
 ments require elevated language; tender sentiments  
 to be expressed in words soft and flowing; and  
 plain language void of ornament, is adapted to sub-  
 jects grave and didactic. Language may be consider-  
 ed as the dress of thought; and where the one is not  
 suited to the other, we are sensible of incongruity, in  
 the same manner as where a judge is dressed like a fop,

This concordance between the thought and the words has been observed by every critic, and is so well understood as not to require any illustration. But there is a concordance of a peculiar kind that has scarcely been touched in works of criticism, though it contributes to neatness of composition. It is what follows.

In a thought of any extent, we commonly find some parts intimately united, some slightly, some disjointed, and some directly opposed to each other. To find these conjunctions and disjunctions imitated in the expression, is a beauty; because such imitation makes the words concordant with the sense. This doctrine may be illustrated by a familiar example: When we have occasion to mention the intimate connection that the soul hath with the body, the expression ought to be, *the soul and body*; because the article *the*, relative to both, makes a connection in the expression, resembling in some degree the connection in the thought; but when the soul is distinguished from the body, it is better to say *the soul and the body*; because the disjunction in the words resembles the disjunction in the thought. We proceed to other examples, beginning with conjunctions.

"Constituit agmen; et expedire tela animosque, equitibus iussit," &c. *Livy*, l. 38. § 25. Here the words that express the connected ideas are artificially connected by subjecting them both to the regimen of one verb. And the two following are of same kind.

"Quum ex paucis quotidie aliqui eorum caderent aut vulnerarentur, et qui superarent, fessii et corporibus et animis essent," &c. *Ibid.* § 29.

Post acer Mnestheus adducto constitit arcu,  
Alta petens, pariterque oculos telumque tetendit.  
*Æneid*, v. 507.

But to justify this artificial connection among the words, the ideas they express ought to be intimately connected; for otherwise that concordance which is required between the sense and the expression will be impaired. In that view, the following passage from Tacitus is exceptionable; where words that signify ideas very little connected, are however forced into an artificial union. "Germania omnis a Gallis, Rhætiisque, et Pannoniis, Rheno et Danubio fluminibus; a Sarmatis Dacisque, mutuo metu aut motibus separatur."

Upon the same account, the following passage seems equally exceptionable.

—The fiend look'd up, and knew  
His mounted scale aloft; nor more, but fled  
Murm'ring, and with him fled the shades of night.  
*Paradise Lost*, B. iv. at the end.

There is no natural connection between a person's flying or retiring, and the succession of day-light to darkness; and therefore to connect artificially the terms that signify these things cannot have a sweet effect.

Two members of a thought connected by their relation to the same action, will naturally be expressed by two members of the period governed by the same verb; in which case these members, in order to improve their connection, ought to be constructed in the same manner. This beauty is so common among good writers as to have been little attended to; but the neglect of it is remarkably disagreeable: for example, "He did not mention Leonora, nor that her father was dead." Better thus: "He did not mention Leonora, nor her father's death."

Where two ideas are so connected as to require but a copulative, it is pleasant to find a connection in the words that express these ideas, were it even so slight as where both begin with the same letter. Thus,

"The peacock, in all his pride, does not display half the colour that appears in the garments of a British lady, when she is either dressed for a ball or a birthday." *Spect.*

"Had not my dog of a steward run away as he did, without making up his accounts, I had still been immersed in sin and sea-coal." *Ib.*

My life's companion, and my bosom-friend,  
One faith, one fame, one fate shall both attend.  
*Dryden, Translation of Æneid.*

Next as to examples of disjunction and opposition in the parts of the thought, imitated in the expression; an imitation that is distinguished by the name of *antithesis*.

Speaking of Coriolanus soliciting the people to be made consul:

With a proud heart he wore his humble weeds.  
*Coriolanus*.  
"Had you rather Cæsar were living, and die all slaves, than that Cæsar were dead, to live all free men?"

*Julius Cæsar*.  
He hath cool'd my friends and heated mine enemies.  
*Shakespeare*.

An artificial connection among the words, is undoubtedly a beauty when it represents any peculiar connection among the constituent parts of the thought; but where there is no such connection, it is a positive deformity, because it makes a discordance between the thought and expression. For the same reason, we ought also to avoid every artificial opposition of words where there is none in the thought. This last, termed *verbal antithesis*, is studied by low writers, because of a certain degree of liveliness in it. They do not consider how incongruous it is, in a grave composition, to cheat the reader, and to make him expect a contrast in the thought, which upon examination is not found there.

A fault directly opposite to the last mentioned, is to conjoin artificially words that express ideas opposed to each other. This is a fault too gross to be in common practice; and yet writers are guilty of it in some degree, when they conjoin by a copulative things transacted at different periods of time. Hence a want of neatness in the following expression: "The nobility too, whom the king had no means of retaining by suitable offices and preferments, had been seized with the general discontent, and unwarily threw themselves into the scale which began already too much to preponderate." *Hume*. In periods of this kind, it appears more neat to express the past time by the participle passive,

Language. passive, thus: "The nobility having been seized with the general discontent, unwarily threw themselves," &c. Or, "The nobility, who had been seized, &c. unwarily threw themselves," &c.

It is unpleasant to find even a negative and affirmative proposition connected by a copulative:

If it appear not plain, and prove untrue,  
Decadly divorce step between me and you.

*Shakespear.*

In mirth and drollery it may have a good effect to connect verbally things that are opposite to each other in the thought. Example: Henry IV. of France introducing the Marechal Biron to some of his friends, "Here, gentlemen, (says he), is the Marechal Biron, whom I freely present both to my friends and enemies."

This rule of studying uniformity between the thought and expression, may be extended to the construction of sentences or periods. A sentence or period ought to express one entire thought or mental proposition; and different thoughts ought to be separated in the expression by placing them in different sentences or periods. It is therefore offending against neatness, to crowd into one period entire thoughts requiring more than one; which is joining in language things that are separated in reality. Of errors against this rule take the following examples.

"Behold, thou art fair, my beloved, yea pleasant: also our bed is green."

Burnet, in the history of his own times, giving lord Sunderland's character, says, "His own notions were always good; but he was a man of great experience."

"I have seen a woman's face break out in heats, as she has been talking against a great Lord, whom she had never seen in her life; and indeed never knew a step-woman that kept her beauty for a twelvemonth." *Spekt.*

Lord Bolingbroke, speaking of Strada: "I single him out among the moderns, because he had the foolish presumption to censure Tacitus, and to write history himself; and your Lordship will forgive this short excursion in honour of a favourite writer."

To crowd into a single member of a period different subjects, is still worse than to crowd them into one period:

—Trojam, genitore Adamasto  
Paupere (mansuetique utinam fortuna) profectus.

*Æneid* iii. 614.

From conjunctions and disjunctions in general, we proceed to comparisons, which make one species of them, beginning with similes. And here also, the intimate connection that words have with their meaning requires, that in describing two resembling objects a resemblance in the two members of the period ought to be studied. To begin with examples of resemblances expressed in words that have no resemblance.

"I have observed of late, the style of some great ministers very much to exceed that of any other productions." *Swift.* This, instead of studying the resemblance of words in a period that expresses a comparison, is going out of one's road to avoid it. Instead of productions, which resemble not ministers great nor small, the proper word is *writers* or *authors*.

"I cannot but fancy, however, that this imitation, which passes for currently with other judgments, must at some time or other have stuck a little with your Lordship." *Shafesb.* Better thus: "I cannot but fancy, however, that this imitation, which passes passes for currently with others, must at some time or other have stuck a little with your Lordship."

"A glutton or mere sensualist is as ridiculous as the other two characters." *Id.*

"They wisely prefer the generous efforts of goodwill and affection, to the reluctant compliances of such as obey by force." *Bolingb.*

It is a still greater deviation from congruity, to affect not only variety in the words, but also in the construction.

Hume speaking of Shakespear: "There may remain a suspicion that we over-rate the greatness of his genius, in the same manner as bodies appear more gigantic on account of their being disproportioned and mishapen." This is studying variety in a period where the beauty lies in uniformity. Better thus: "There may remain a suspicion that we over-rate the greatness of his genius, in the same manner as we over-rate the greatness of bodies that are disproportioned and mishapen."

Next of a comparison where things are opposed to each other. And here it must be obvious, that if resemblance ought to be studied in the words which express two resembling objects, there is equal reason for studying opposition in the words which express contrasted objects. This rule will be best illustrated by examples of deviations from it.

"A friend exaggerates a man's virtues; an enemy inflames his crimes." *Spekt.* Here the opposition in the thought is neglected in the words; which at first view seem to import, that the friend and enemy are employed in different matters, without any relation to each other, whether of resemblance or of opposition. And therefore the contrast or opposition will be better marked by expressing the thought as follows: "A friend exaggerates a man's virtues, an enemy his crimes."

"The wife man is happy when he gains his approbation; the fool when he recommends himself to the applause of those about him." *Id.* Better: "The wife man is happy when he gains his own approbation, the fool when he gains that of others."

We proceed to a rule of a different kind. During the course of a period, the scene ought to be continued without variation: the changing from person to person, from subject to subject, or from person to subject, within the bounds of a single period, distracts the mind, and affords no time for a solid impression.

Hook, in his Roman history, speaking of Eumenes, who had been beat to the ground with a stone, says, "After a short time he came to himself; and the next day, they put him on board his ship, which conveyed him first to Corinth, and thence to the island of Ægina."

The following period is unpleasant, even by a very slight deviation from the rule: "That sort of instruction which is acquired by inculcating an important moral truth," &c. This expression includes two persons, one acquiring, and one inculcating; and the scene is changed without necessity. To avoid this blemish,



blemish, the thought may be expressed thus: "That sort of instruction which is afforded by inculcating," &c.

The bad effect of such a change of person is remarkable in the following passage: "The Britons, daily harassed by cruel inroads from the Picts, were forced to call in the Saxons for their defence, who consequently reduced the greatest part of the island to their own power, drove the Britons into the most remote and mountainous parts, and the rest of the country, in customs, religion, and language, became wholly Saxon." *Swift*.

The following passage has a change from subject to person: "This prostitution of praise is not only a deceit upon the grofs of mankind, who take their notion of characters from the learned; but also the better sort must by this means lose some part at least of that desire of fame which is the incentive to generous actions, when they find it promiscuously bestowed on the meritorious and undeserving." *Guardian*, No 4.

The present head, which relates to the choice of materials, shall be closed with a rule concerning the use of copulatives. Longinus observes, that it animates a period to drop the copulatives; and he gives the following example from Xenophon: "Closing their shields together, they were push'd, they fought, they flew, they were slain." The reason may be what follows. A continued sound, if not loud, tends to lay us asleep: an interrupted sound rouses and animates by its repeated impulses: this feet composed of syllables, being pronounced with a sensible interval between each, make more lively impressions than can be made by a continued sound. A period of which the members are connected by copulatives, produceth an effect upon the mind approaching to that of a continued sound; and therefore the suppressing copulatives must animate a description. It produces a different effect akin to that mentioned: the members of a period connected by proper copulatives, glide smoothly and gently along; and are a proof of sedateness and leisure in the speaker: on the other hand, one in the hurry of passion, neglecting copulatives and other particles, expresses the principal image only; and for that reason, hurry or quick action is best expressed without copulatives:

Veni, vidi, vici.

— Ite:

Ferte citi flammæ, data vela, impellite remos.

*Æneid*. iv. 593.

Quis globus, O cives, caligine volvitur atra?

Ferte citi ferrum, date tela, scandite muros.

Hostis adest, eja. *Æneid*. ix. 37.

In this view Longinus justly compares copulatives in a period to strait tying, which in a race obstructs the freedom of motion.

It follows, that a plurality of copulatives in the same period ought to be avoided; for if the laying aside copulatives give force and liveliness, a redundancy of them must render the period languid. The following instance may be appealed to, though there are but two copulatives: "Upon looking over the letters of my female correspondents, I find several from women complaining of jealous husbands; and at the same time protesting their own innocence, and desiring my advice upon this occasion." *Speil*.

Where the words are intended to express the coldness of the speaker, there indeed the redundancy of copulatives is a beauty:

"Dining one day at an alderman's in the city, Peter observed him expatiating after the manner of his brethren, in the praises of his sirloin of beef. "Beef," (said the sage magistrate), is the king of meat: beef comprehends in it the quintessence of partridge, and quail, and venison, and pheasant, and plum-pudding, and custard." *Tale of a Tub*, § 4. And the author shows great delicacy of taste by varying the expression in the mouth of Peter, who is represented more animated: "Bread, (says he), dear brothers, is the staff of life, in which bread is contained, inclusive, the quintessence of beef, mutton, veal, venison, partridge, plum-pudding, and custard."

Another case must also be excepted. Copulatives have a good effect where the intention is to give an impression of a great multitude consisting of many divisions; for example: "The army was composed of, Grecians, and Carians, and Lycians, and Pamphylians, and Phrygians." The reason is, that a leisurely survey, which is expressed by the copulatives, makes the parts appear more numerous than they would do by a hasty survey: in the latter case, the army appears in one group; in the former, we take as it were an accurate survey of each nation, and of each division.

2. To pave the way for the rules of arrangement, it will be here necessary to explain the difference between a natural style, and that where transposition or inversion prevails. In a natural style, relative words are by juxtaposition connected with those to which they relate, going before or after, according to the peculiar genius of the language. Again, a circumstance connected by a preposition, follows naturally the word with which it is connected. But this arrangement may be varied, when a different order is more beautiful: a circumstance may be placed before the word with which it is connected by a preposition; and may be interjected even between a relative word and that to which it relates. When such liberties are frequently taken, the style becomes inverted or transposed.

But as the liberty of inversion is a capital point in the present subject, it will be necessary to examine it more narrowly, and in particular to trace the several degrees in which an inverted style recedes more and more from that which is natural. And first, as to the placing a circumstance before the word with which it is connected, this is the easiest of all inversion, even so easy as to be consistent with a style that is properly termed *natural*: witness the following examples.

"In the sincerity of my heart, I profess," &c.

"By our own ill management, we are brought to so low an ebb of wealth and credit, that," &c.

"On Thursday morning there was little or nothing transacted in Change-alley."

"At St Bride's church in Fleetstreet, Mr Woolston, (who writ against the miracles of our Saviour), in the utmost terrors of conscience, made a public recantation."

The interjecting a circumstance between a relative word and that to which it relates, is more properly termed *inversion*; because, by a disjunction of words intimately connected, it recedes farther from a natural style. But this licence has degrees; for the disjunction

tion is more violent in some cases than in others.

In nature, though a subject cannot exist without its qualities, nor a quality without a subject; yet in our conception of these, a material difference may be remarked. We cannot conceive a quality but as belonging to some subject: it makes indeed a part of the idea which is formed of the subject. But the opposite holds not; for though we cannot form a conception of a subject void of all qualities, a partial conception may be formed of it, abstracting from any particular quality: we can, for example, form the idea of a fine Arabian horse without regard to his colour, or of a white horse without regard to his size. Such partial conception of a subject, is still more easy with respect to action or motion; which is an occasional attribute only, and has not the same permanency with colour or figure: we cannot form an idea of motion independent of a body; but there is nothing more easy than to form an idea of a body at rest. Hence it appears, that the degree of inversion depends greatly on the order in which the related words are placed: when a substantive occupies the first place, the idea it suggests must subsist in the mind at least for a moment, independent of the relative words afterward introduced; and that moment may without difficulty be prolonged by interjecting a circumstance between the substantive and its connections. This liberty therefore, however frequent, will scarce alone be sufficient to denominate a style *inverted*. The case is very different, where the word that occupies the first place denotes a quality or an action; for as these cannot be conceived without a subject, they cannot without greater violence be separated from the subject that follows; and for that reason, every such separation by means of an interjected circumstance belongs to an inverted style.

To illustrate this doctrine, examples are necessary. In the following, the word first introduced does not imply a relation:

—Nor Eve to iterate  
Her former trespasses fear'd.

—Hunger and thirst at once,  
Powerful persuaders, quicken'd at the scent  
Of that alluring fruit, urg'd me to keen.

Moon that now meet'st the orient sun, now shi'lt  
With the fix'd stars, fixed in their orb that flies,  
And ye five other wand'ring fires that move  
In mystic dance not without song, resound  
His praise.

Where the word first introduced imports a relation, the disjunction will be found more violent:

Of man's first disobedience, and the fruit  
Of that forbidden tree, whose mortal taste  
Brought death into the world, and all our wo,  
With loss of Eden, till one greater man  
Restore us, and regain the blissful seat,  
Sing heav'nly muse.

—Upon the firm opacous globe  
Of this round world, whose first convex divides  
The luminous inferior orbs, inclos'd  
From chaos and th' inroad of darkness old,  
Satan alighted walks.

On a sudden open fly,  
With impetuous recoil and jarring found,  
Th' infernal doors.

Wherein remain'd,  
For what could else? to our almighty foe  
Clear victory, to our part loss and rout.

Language would have no great power, were it confined to the natural order of ideas: By inversion a thousand beauties may be compass'd, which must be relinquish'd in a natural arrangement.

*Rules.* 1. In the arrangement of a period, as well as in a right choice of words, the first and great object being perspicuity, the rule above laid down, that perspicuity ought not to be sacrificed to any other beauty, holds equally in both. Ambiguities occasioned by a wrong arrangement are of two sorts; one where the arrangement leads to a wrong sense, and one where the sense is left doubtful. The first, being the more culpable, shall take the lead, beginning with examples of words put in a wrong place.

"How much the imagination of such a preference must exalt a genius, we may observe *merely* from the influence which an ordinary preference has over men." *Shafesb.* This arrangement leads to a wrong sense: the adverb *merely* seems by its position to affect the preceding word; whereas it is intended to affect the following words, an *ordinary preference*; and therefore the arrangement ought to be thus: "How much the imagination of such a preference must exalt a genius, we may observe from the influence which an ordinary preference *merely* has over men." [Or better],—"which even an ordinary preference has over men."

"Sixtus the Fourth was, if I mistake not, a great collector of books at least." *Boling.* The expression here leads evidently to a wrong sense; the adverb *at least*, ought not to be connected with the substantive *books*, but with *collector*, thus: "Sixtus the Fourth was a great collector at least, of books."

Speaking of Lewis XIV. "If he was not the greatest king, he was the best actor of majesty at least, that ever filled a throne." *Id.* Better thus: "If he was not the greatest king, he was at least the best actor of majesty," &c. This arrangement removes the wrong sense occasioned by the juxtaposition of *majesty* and *at least*.

The following examples are of a wrong arrangement of members.

"I have confined myself to those methods for the advancement of piety, which are in the power of a prince limited like ours by a strict execution of the laws." *Swift.* The structure of this period leads to a meaning which is not the author's, viz. power limited by a strict execution of the laws. That wrong sense is removed by the following arrangement: "I have confined myself to those methods for the advancement of piety, which, by a strict execution of the laws, are in the power of a prince limited like ours."

"This morning, when one of lady Lizard's daughters was looking over some hoods and ribbands brought by her tirewoman, with great care and diligence, I employ'd no less in examining the box which contained them." *Guardian.* The wrong sense occasioned by this arrangement, may be easily prevented by varying

Language. it thus : " This morning, when, with great care and diligence, one of Lady Lizard's daughters was looking over some hoods and ribbands," &c.

" A great flone that I happened to find after a long search by the sea-shore, served me for an anchor." *Swift*. One would think that the search was confined to the sea-shore ; but as the meaning is, that the great flone was found by the sea-shore, the period ought to be arranged thus : " A great flone, that, after a long search, I happened to find by the sea-shore, served me for an anchor."

Next of a wrong arrangement where the sense is left doubtful ; beginning, as in the former sort, with examples of a wrong arrangement of words in a member.

" These forms of conversation by degrees multiplied and grew troublesome." *Speck*. Here it is left doubtful whether the modification by degrees relates to the preceding member or to what follows : it should be, " These forms of conversation multiplied by degrees."

" Nor does this false modesty expose us only to such actions as are indifereet, but very often to such as are highly criminal." *Speck*. The ambiguity is removed by the following arrangement : " Nor does this false modesty expose us to such actions only as are indifereet." &c.

" The empire of Blefuscu is an island situated to the north-east side of Lilliput, from whence it is parted only by a channel of 800 yards wide." *Swift*. The ambiguity may be removed thus : — " from whence it is parted by a channel of 800 yards wide only."

In the following examples the sense is left doubtful by wrong arrangement of members.

" The minister who grows less by his elevation, like a little statue placed on a mighty pedestal, will always have his jealousy strong about him." *Bolingbroke*. Here, so far as can be gathered from the arrangement, it is doubtful, whether the object introduced by way of simile relates to what goes before or to what follows. The ambiguity is removed by the following arrangement : " The minister, who, like a little statue placed on a mighty pedestal, grows less by his elevation, will always," &c.

Speaking of the superstitious practice of locking up the room where a person of distinction dies : " The knight, seeing his habitation reduced to so small a compass, and himself in a manner shut out of his own house, upon the death of his mother, ordered all the apartments to be flung open, and exorcised by his chaplain." *Speck*. Better thus : " The knight, seeing his habitation reduced to so small a compass, and himself in a manner shut out of his own house, ordered, upon the death of his mother, all the apartments to be flung open."

Speaking of some indecencies in conversation : " As it is impossible for such an irrational way of conversation to last long among a people that make any profession of religion, or show of modesty, if the country gentlemen get into it, they will certainly be left in the lurch." *Ib.* The ambiguity vanishes in the following arrangement : — " the country gentlemen, if they get into it, will certainly be left in the lurch."

" And since it is necessary that there should be a perpetual intercourse of buying and selling, and deal-

ing upon credit, where fraud is permitted or connived at, or hath no law to punish it, the honest dealer is always undone, and the knave gets the advantage." *Swift*. Better thus : " And since it is necessary that there should be a perpetual intercourse of buying and selling, and dealing upon credit, the honest dealer, where fraud is permitted or connived at, or hath no law to punish it, is always undone, and the knave gets the advantage."

From these examples, the following observation will occur : That a circumstance ought never to be placed between two capital members of a period ; for by such situation it must always be doubtful, so far as we gather from the arrangement, to which of the two members it belongs : where it is interjected, as it ought to be, between parts of the member to which it belongs, the ambiguity is removed, and the capital members are kept distinct, which is a great beauty in composition. In general, to preserve members distinct that signify things distinguished in the thought, the best method is, to place first in the consequent member, some word that cannot connect with what precedes it.

If it shall be thought, that the objections here are too scrupulous, and that the defect of perspicuity is easily supplied by accurate punctuation ; the answer is, That punctuation may remove an ambiguity, but will never produce that peculiar beauty which is perceived when the sense comes out clearly and distinctly by means of a happy arrangement. Such influence has this beauty, that, by a natural transition of perception, it is communicated to the very found of the words, so as in appearance to improve the music of the period. But as this curious subject comes in more properly elsewhere, it is sufficient at present to appeal to experience, that a period, so arranged as to bring out the sense clear, seems always more musical than where the sense is left in any degree doubtful.

The next rule is, That words expressing things connected in the thought, ought to be placed as near together as possible. This rule is derived immediately from human nature, prone in every instance to place together things in any manner connected : where things are arranged according to their connections, we have a sense of order ; otherwise we have a sense of disorder, as of things placed by chance : and we naturally place words in the same order in which we would place the things they signify. The bad effect of a violent separation of words or members thus intimately connected, will appear from the following examples.

" For the English are naturally fanciful, and very often disposed, by that gloominess and melancholy of temper which is so frequent in our nation, to many wild notions and visions, to which others are not so liable." *Speck*. Here the verb or assertion is, by a pretty long circumstance, violently separated from the subject to which it refers : this makes a harsh arrangement ; the less excusable that the fault is easily prevented by placing the circumstance before the verb, after the following manner : " For the English are naturally fanciful, and, by that gloominess and melancholy of temper which is so frequent in our nation, are often disposed to many wild notions, &c."

" From whence we may date likewise the rivalry of



Language. the house of France, for we may reckon that of Valois and that of Bourbon as one upon this occasion, and the house of Austria, that continues at this day, and has oft cost so much blood and so much treasure in the course of it." *Bolingb.*

"It cannot be impertinent or ridiculous therefore in such a country, whatever it might be in the abbot of St Real's, which was Savoy I think; or in Peru, under the incas, where Garcilasso de la Vega says it was lawful for none but the nobility to study—for men of all degrees to instruct themselves in those affairs wherein they may be actors, or judges of those that act, or controllers of those that judge." *Ibid.*

"If Scipio, who was naturally given to women, for which anecdote we have, if I mistake not, the authority of Polybius, as well as some verses of Nevius preserved by Aulus Gellius, had been educated by Olympias at the court of Philip, it is improbable that he would have reformed the beautiful Spaniard." *Ibid.*

If any one have a curiosity for more specimens of this kind, they will be found without number in the works of the same author.

A pronoun, which saves the naming a person or thing a second time, ought to be placed as near as possible to the name of that person or thing. This is a branch of the foregoing rule; and with the reason there given, another concurs, viz. That if other ideas intervene, it is difficult to recal the person or thing by reference.

"If I had leave to print the Latin letters transmittet to me from foreign parts, they would fill a volume, and be a full defence against all that Mr Partridge, or his accomplices of the Portugal inquisition, will be ever able to object; *who*, by the way, are the only enemies my predictions have ever met with at home or abroad." Better thus:—"and be a full defence against all that can be objected by Mr Partridge, or his accomplices of the Portugal inquisition; who, by the way, are," &c.

"There being a round million of creatures in human figure, throughout this kingdom, *whose* whole subsistence," &c. *Swift*. Better: "There being, throughout this kingdom, a round million of creatures in human figure, whose whole subsistence," &c.

The following rule depends on the communication of emotions to related objects; a principle in human nature that hath an extensive operation: and we find this operation, even where the objects are not otherwise related than by juxtaposition of the words that express them. Hence, to elevate or depress an object, one method is, to join it in the expression with another that is naturally high or low: witness the following speech of Eumenes to the Roman senate.

"*Causam veniendi sibi Romam fuisse, præter cupiditatem visendi deos hominesque, quorum beneficio in ea fortuna esset, supra quam ne optare quidem auderet, etiam ut coram moneret senatum ut Persei conatus obviam iret.*" *Livy*. To join the Romans with the gods in the same enunciation, is an artful stroke of flattery, because it tacitly puts them on a level.

On the other hand, the degrading or vilifying an object, is done successfully by ranking it with one that is really low: "I hope to have this entertainment in readiness for the next winter; and doubt not but it will please more than the opera or puppet-

show." *Specht*.

"Manifest have been the judgments which Heaven from time to time, for the chastisement of a sinful people, has inflicted upon whole nations. For when the degeneracy becomes common, it is but just the punishment should be general. Of this kind, in our own unfortunate country, was that destructive pestilence, whose mortality was so fatal as to sweep away, if Sir William Petty may be believed, five millions of Christian souls, besides women and Jews." *Arbutnot*.

"Such also was that dreadful conflagration, ensuing in this famous metropolis of London, which consumed, according to the computation of Sir Samuel Moreland, 100,000 houses, not to mention churches and stables." *Ibid.*

But on condition it might pass into a law, I would gladly exempt both lawyers of all ages, subaltern and field-officers, young heirs, dancing-masters, pick-pockets, and players. *Swift*.

Sooner let earth, air, sea, to chaos fall,  
Men, monkeys, lap-dogs, parrots, perish all.

*Rape of the Lock.*

Circumstances in a period resemble small stones in a building, employed to fill up vacuities among those of a larger size. In the arrangement of a period, such under-parts crowded together make a poor figure; and never are graceful but when interspersed among the capital parts.

"It is likewise urged, that there are, by computation, in this kingdom, above 10,000 parsons, whose revenues, added to those of my lords the bishops, would suffice to maintain, &c." *Swift*. Here two circumstances, viz. *by computation*, and *in this kingdom*, are crowded together unnecessarily. They make a better appearance separated in the following manner: "It is likewise urged, that in this kingdom there are, by computation, above 10,000 parsons, &c."

If there be room for a choice, the sooner a circumstance is introduced, the better; because circumstances are proper for that coolness of mind, with which we begin a period as well as a volume: in the progress, the mind warms, and has a greater relish for matters of importance. When a circumstance is placed at the beginning of the period, or near the beginning, the transition from it to the principal subject is agreeable: it is like ascending, or going upward. On the other hand, to place it late in the period has a bad effect; for after being engaged in the principal subject, one is with reluctance brought down to give attention to a circumstance. Hence evidently the preference of the following arrangement, "Whether in any country a choice altogether unexceptionable has been made, seems doubtful," before this other, "Whether a choice altogether unexceptionable has in any country been made," &c.

For this reason the following period is exceptionable in point of arrangement. "I have considered formerly, with a good deal of attention, the subject upon which you command me to communicate my thoughts to you." *Boling*. Which, with a slight alteration, may be improved thus: "I have formerly, with a good deal of attention, considered the subject," &c.

Swift, speaking of a virtuous and learned education: "And although they may be, and too often are drawn,

Language.

Language. drawn, by the temptations of youth, and the opportunities of a large fortune, into some irregularities, *when they come forward into the great world*; it is ever with reluctance and compunction of mind, because their bias to virtue still continues." Better: "And although, *when they come forward into the great world*, they may be, and too often," &c.

In arranging a period, it is of importance to determine in what a part of it a word makes the greatest figure, whether at the beginning, during the course, or at the close. The breaking silence rouses the attention, and prepares for a deep impression at the beginning: the beginning, however, must yield to the close; which being succeeded by a pause, affords time for a word to make its deepest impression. Hence the following rule, That to give the utmost force to a period, it ought, if possible, to be closed with that word which makes the greatest figure. The opportunity of a pause should not be thrown away upon accessories, but reserved for the principal object, in order that it may make a full impression: which is an additional reason against closing a period with a circumstance. There are, however, periods, that admit not such a structure; and in that case, the capital word ought, if possible, to be placed in the front, which next to the close is the most advantageous for making an impression. Hence, in directing our discourse to a man of figure, we ought to begin with his name; and one will be sensible of a degradation when this rule is neglected, as it frequently is for the sake of verse. We give the following examples.

Integer vitæ, scelerisque purus,  
Non eget Mauri javalis, neque arcu,  
Nec venenatis gravida sagittis,  
Fusce, pharetrâ. *Horat. Carm. l. 1. ode 22.*

Je crains Dieu, cher Abner, et n'ai point d'autre crainte.

In these examples, the name of the person addressed to, make a mean figure, being like a circumstance slip into a corner. That this criticism is well founded, we need no other proof than Addison's translation of the last example:

O Abner! I fear my God, and I fear none but him. *Guardian, n° 117.*

O father, what intends thy hand, the cry'd,  
Against thy only son? What fury, O son,  
Possesses thee to bend that mortal dart  
Against thy father's head?

*Paradise lost, book ii. l. 727.*

Every one must be sensible of a dignity in the invocation at the beginning, which is not attained by that in the middle. It is not meant, however, to censure this passage: on the contrary, it appears beautiful, by distinguishing the respect that is due to a father from that which is due to a son.

The substance of what is said in this and the foregoing section, upon the method of arranging words in a period, so as to make the deepest impression with respect to sound as well as signification, is comprehended in the following observation: That order of words in a period will always be the most agreeable, where, without obscuring the sense, the most important ima-

ges, the most sonorous words, and the longest members, bring up the rear.

Hitherto of arranging single words, single members, and single circumstances. But the enumeration of many particulars in the same period is often necessary: and the question is, In what order they should be placed. And, first, with respect to the enumerating particulars of equal rank: As there is no cause for preferring any one before the rest, it is indifferent to the mind in what order they be viewed; therefore it is indifferent in what order they be named. 2dly, If a number of objects of the same kind, differing only in size, are to be ranged along a straight line, the most agreeable order to the eye is that of an increasing series: in surveying a number of such objects, beginning at the least, and proceeding to greater and greater, the mind swells gradually with the successive objects, and in its progress has a very sensible pleasure. Precisely for the same reason, words expressive of such objects ought to be placed in the same order. The beauty of this figure, which may be termed a *climax in sense*, has escaped Lord Bolingbroke in the first member of the following period: "Let but one, great, brave, disinterested, active man arise, and he will be received, followed, and almost adored." The following arrangement has sensibly a better effect: "Let but one brave, great, active, disinterested man arise, &c." Whether the same rule ought to be followed in enumerating men of different ranks, seems doubtful: on the one hand, a number of persons presented to the eye in form of an increasing series, is undoubtedly the most agreeable order; on the other hand, in every list of names, we set the person of the greatest dignity at the top, and descend gradually through his inferiors. Where the purpose is to honour the persons named according to their rank, the latter ought to be followed; but every one who regards himself only, or his reader, will choose the former order. 3dly, As the sense of order directs the eye to descend from the principal to its greatest accessory, and from the whole to its greatest part, and in the same order through all the parts and accessories, till we arrive at the minutest; the same order ought to be followed in the enumeration of such particulars.

When force and liveliness of expression are demanded, the rule is, to suspend the thought as long as possible, and to bring it out full and entire at the close: which cannot be done but by inverting the natural arrangement. By introducing a word or member before its time, curiosity is raised about what is to follow; and it is agreeable to have our curiosity gratified at the close of the period: the pleasure we feel resembles that of seeing a stroke exerted upon a body by the whole collected force of the agent. On the other hand, where a period is so constructed as to admit more than one complete close in the sense, the curiosity of the reader is exhausted at the first close, and what follows appears languid or superfluous: his disappointment contributes also to that appearance, when he finds, contrary to expectation, that the period is not yet finished. Cicero, and after him Quintilian, recommend the verb to the last place. This method evidently tends to suspend the sense till the close of the period; for without the verb the sense cannot be complete: and when the verb happens to be the capital

tal word, which it frequently is, it ought at any rate to be the last, according to another rule above laid down. The following period is placed in its natural order: "Were instruction an essential circumstance in epic poetry, I doubt whether a single instance could be given of this species of composition in any language." The period thus arranged admits a full close upon the word *composition*; after which it goes on languidly, and closes without force. This blameworthiness will be avoided by the following arrangement: "Were instruction an essential circumstance in epic poetry, I doubt whether, in any language, a single instance could be given of this species of composition."

"Some of our most eminent divines have made use of this Platonic notion, as far as it regards the subsistence of our passions after death, with great beauty and strength of reason." *Spec.* Better thus: "Some of our most eminent divines have, with great beauty and strength of reason, made use of this Platonic notion." &c.

"Men of the best sense have been touched, more or less, with these groundless horrors and presages of futurity, upon surveying the most indifferent works of nature." *Id.* Better, "Upon surveying the most indifferent works of nature, men of the best sense," &c.

"She soon informed him of the place he was in, which, notwithstanding all its horrors, appeared to him more sweet than the bower of Mahomet, in the company of his Balfora." *Guardian.* Better, "She soon, &c. which appeared to him, in the company of his Balfora, more sweet than the bower of Mahomet."

None of the rules for the composition of periods are more liable to be abused, than those last mentioned; witness many Latin writers, among the moderns especially, whose style, by inversions too violent, is rendered harsh and obscure. Suspension of the thought till the close of the period, ought never to be preferred before perspicuity. Neither ought such suspension to be attempted in a long period; because in that case the mind is bewildered amidst a profusion of words: a traveller, while he is puzzled about the road, relishes not the finest prospect: "All the rich presents which Altyages had given him at parting, keeping only some Median hortes, in order to propagate the breed of them in Persia, he distributed among his friends whom he left at the court of Ecabata." *Trav. of Cyrus.*

III. *Beauties from a resemblance between Sound and Signification.* There being frequently a strong resemblance of one sound to another, it will not be surprising to find an articulate sound resembling one that is not articulate: thus the sound of a bow-string is imitated by the words that express it:

—The string let fly,

*Twang'd short and sharp*, like the shrill swallow's cry.  
*Odyssey*, xxi. 449.

The sound of felling trees in a wood:

Loud sounds the ax, redoubling strokes on strokes,  
On all sides round the forest hurls her oaks  
Headlong. Deep echoing groan the thickets brown,  
Then *ruffling, crackling, crashing*, thunder down.

*Iliad*, xxiii. 144.

But when loud surges lash the founding shore,  
The hoarse rough verse should like the torrent roar.  
*Pope's Essay on Criticism*, 369.

Dire Scylla there a scene of horror forms,  
And here Charybdis fills the deep with storms:  
When the tide rushes from her rumbling caverns,  
The rough rock roars; tumultuous boil the waves.

*Pope.*

No person can be at a loss about the cause of this beauty: it is obviously that of imitation.

That there is any other natural resemblance of sound to signification, must not be taken for granted. There is no resemblance of sound to motion, nor of sound to sentiment. We are, however, apt to be deceived by artful pronunciation: the same passage may be pronounced in many different tones, elevated or humble, sweet or harsh, brisk or melancholy, so as to accord with the thought or sentiment: such concord must be distinguished from that concord between sound and sense which is perceived in some expressions independent of artful pronunciation; the latter is the poet's work, the former must be attributed to the reader. Another thing contributes still more to the deceit: in language, sound and sense being intimately connected, the properties of the one are readily communicated to the other; for example, the quality of grandeur, of sweetness, or of melancholy, though belonging to the thought solely, is transferred to the words, which by that means resemble in appearance the thought that is expressed by them. That there may be a resemblance of articulate sounds to some that are not articulate, is self-evident; and that in fact there exist such resemblances successfully employed by writers of genius, is clear from the foregoing examples, and from many others that might be given. But we may safely pronounce, that this natural resemblance can be carried no farther: the objects of the different senses differ so widely from each other, as to exclude any resemblance; sound in particular, whether articulate or inarticulate, resembles not in any degree taste, smell, nor motion; and as little can it resemble any internal sentiment, feeling, or emotion. But must we then admit, that nothing but sound can be imitated by sound? Taking imitation in its proper sense, as importing a resemblance between two objects, the proposition must be admitted: and yet in many passages that are not descriptive of sound, every one must be sensible of a peculiar concord between the sound of the words and their meaning. As there can be no doubt of the fact, what remains is to inquire into its cause.

Resembling causes may produce effects that have no resemblance; and causes that have no resemblance may produce resembling effects. A magnificent building, for example, resembles not in any degree an heroic action; and yet the emotions they produce are concordant, and bear a resemblance to each other. We are still more sensible of this resemblance in a song, when the music is properly adapted to the sentiment: there is no resemblance between thought and sound; but there is the strongest resemblance between the emotion raised by music tender and pathetic, and that



Language. that raised by the complaint of an unsuccessful lover. Language.

Applying this observation to the present subject, it appears, that, in some instances, the sound even of a single word makes an impression resembling that which is made by the thing it signifies: witness the word *running*, composed of two short syllables; and more remarkably the words *rapidity*, *impetuosity*, *precipitation*. Brutal manners produce in the spectator an emotion not unlike what is produced by a harsh and rough sound; and hence the beauty of the figurative expression, *rugged manners*. Again, the word *little*, being pronounced with a very small aperture of the mouth, has a weak and faint sound, which makes an impression resembling that made by a diminutive object. This resemblance of effects is still more remarkable where a number of words are connected in a period: words pronounced in succession make often a strong impression; and when this impression happens to accord with that made by the sense, we are sensible of a complex emotion, peculiarly pleasant; one proceeding from the sentiment, and one from the melody or sound of the words. But the chief pleasure proceeds from having these two concordant emotions combined in perfect harmony, and carried on in the mind to a full close. Except in the single case where sound is described, all the examples given by critics of sense being imitated in sound, resolve into a resemblance of effects: emotions raised by sound and signification may have a resemblance; but sound itself cannot have a resemblance to any thing but sound.

Proceeding now to particulars, and beginning with those case cases where the emotions have the strongest resemblance, we observe, first, That by a number of syllables in succession, an emotion is sometimes raised, extremely similar to that raised by successive motion; which may be evident even to those who are defective in taste, from the following fact, that the term *movement* in all languages is equally applied to both. In this manner, successive motion, such as walking, running, galloping, can be imitated by a succession of long or short syllables, or by a due mixture of both: for example, slow motion may be justly imitated in a verse where long syllables prevail; especially when aided by a slow pronunciation:

Ille inter sese magnâ vi brachia tollunt.

*Georg.* iv. 174.

On the other hand, swift motion is imitated by a succession of short syllables:

Quadrupedante patrem sonitu quatit ungulo campum.  
Again:

Radit iter liquidum, celeres neque commovet alas.

Thirdly, A line composed of monosyllables makes an impression, by the frequency of its pauses, similar to what is made by laborious interrupted motion:

With many a weary step, and many a groan,  
Up the high hill he heaves a huge round stone.

*Odyssey*, xi. 736.

First march the heavy mules securely slow;  
O'er hills, o'er dales, o'er crags, o'er rocks they go.

*Iliad*, xxiii. 138.

Fourthly, The impression made by rough sounds in

succession, resembles that made by rough or tumultuous motion: on the other hand, the impression of smooth sounds resembles that of gentle motion. The following is an example of both:

Two craggy rocks projecting to the main,  
The roaring wind's tempestuous rage restrain;  
Within, the waves in softer murmurs glide,  
And ships secure without their hauliers ride.

*Odyssey*, iii. 118.

Another example of the latter:

Soft is the strain when Zephyr gently blows,  
And the smooth stream in smoother numbers flows.

*Essay on Criticism*, 366.

Fifthly, Prolonged motion is expressed in an Alexandrine line. The first example shall be of a slow motion prolonged:

A needless Alexandrine ends the song:  
That, like a wounded snake, drags its slow length along.  
*Ib.* 356.

The next example is of forcible motion prolonged:

The waves behind impel the waves before,  
Wide-rolling, foaming high, and tumbling to the shore.  
*Iliad*, xiii. 1004.

The last shall be of rapid motion prolonged:

Not so when swift Camilla scours the plain,  
Flies o'er th' unbending corn, and skims along the main.  
*Essay on Criticism*, 373.

Again, speaking of a rock torn from the brow of a mountain:

Still gath'ring force, it smokes, and, urg'd amain,  
Whirls, leaps, and thunders down, impetuous to the plain.  
*Iliad*, xiii. 197.

Sixthly, A period consisting mostly of long syllables, that is, of syllables pronounced slow, produceth an emotion resembling faintly that which is produced by gravity and solemnity. Hence the beauty of the following verse:

Olle sedato respondit corde Latinus.

It resembles equally an object that is insipid and uninteresting.

Tædet quotidianarum harum formarum.

*Terence.*

Seventhly, A slow succession of ideas is a circumstance that belongs equally to settled melancholy, and to a period composed of polysyllables pronounced slow; and hence, by similarity of emotions, the latter is imitative of the former:

In those deep solitudes, and awful cells,  
Where heav'nly-pensive Contemplation dwells,  
And ever-musing Melancholy reigns.

*Pope, Eloisa to Abelard.*

Eightly, A long syllable made short, or a short syllable made long, raises, by the difficulty of pronouncing contrary to custom, a feeling similar to that of hard labour:

When

Ninthly, Harsh or rough words pronounced with difficulty, excite a feeling similar to that which proceeds from the labour of thought to a dull writer:

Just writes to make his barrenness appear,  
 And strains from hard-bound brains eight lines a year.  
*Pope's Epistle to Dr Arbuthnot*, l. 181.

We shall close with one example more, which of all makes the finest figure. In the first section mention is made of a climax in found; and in the second of a climax in sense. It belongs to the present subject to observe, that when these coincide in the same passage, the concordance of found and sense is delightful: the reader is conscious of pleasure not only from the two climaxes separately, but of an additional pleasure from their concordance, and from finding the sense so justly imitated by the found. In this respect, no periods are more perfect than those borrowed from Cicero in the first section.

The concord between sense and found is not less agreeable in what may be termed an *anticlimax*, where the progress is from great to little; for this has the effect to make diminutive objects appear still more diminutive. Horace affords a striking example:

Parturient montes, nascetur ridiculus mus.

The arrangement here is singularly artful: the first place is occupied by the verb, which is the capital word by its sense as well as found: the close is reserved for the word that is the meanest in sense as well as in found: and it must not be overlooked, that the resembling sounds of the two last syllables give a ludicrous air to the whole.

In this article we have mentioned none of the beauties of language but what arise from words taken in their proper sense. Beauties that depend on the metaphorical and figurative power of words, are treated under the separate articles of FIGURES, PERSONIFICATION, APOSTROPHE, HYPERBOLE, METAPHOR, &c. See also ORATORY.

*Law LANGUAGE.* See *Law-Language*.

*Written LANGUAGE.* See *READING*, n° xiii.

**LANGUED**, in heraldry, expresses such animals whose tongue, appearing out of the mouth, is borne of a different colour from the rest of the body.

**LANGUEDOC**, a large and maritime province of France; bounded on the north by Quercy, Rouergue, Auvergne, and Lannois; on the east by Dauphiny and Provence; on the west by Gascony; and on the south by the Mediterranean Sea and Roussillon. It is 225 miles in length, and 100 in breadth where broadest. The clergy are more rich and numerous here than in the rest of France, there being three archbishops and 20 bishops. Languedoc is divided into the Upper and Lower; and in general it is a very pleasant country, fertile in corn, fruits, and excellent wines; and the inhabitants carry on a considerable trade. There are many curious medicinal plants, with iron mines, quarries of marble, and turquoise stones. There is also a great deal of kelp, and on the heaths are considerable numbers of the kermes oak. The principal rivers are the Rhone, the Garonne, the Aude, the

Tarne, the Allier, and the Loire. There are also a great number of mineral springs. Thoulouse is the capital town. This province is famous for the royal canal, which divides it in two, joining the Mediterranean with the Atlantic Ocean. This canal was undertaken in 1666, and finished in 1680; the mathematician who undertook it made a basin 400 yards long, 300 broad, and seven feet deep, which is always kept full of water, and may be let out by means of a sluice on the side of the Mediterranean, as well as by another on the side of the Atlantic.

**LANGUET** (Hubert), born at Viteaux in Burgundy in 1518, gained great reputation by his learning and virtue, in the 16th century. Having read one of Melancthon's books at Bologna, he conceived so high an esteem for the author, that he went to Wirtemberg purposely to visit him; he arrived there in 1549, when he contracted a strict friendship with Melancthon, and embraced the Protestant religion. In 1565, he was one of the first counsellors of Augustus elector of Saxony, who employed him in several important affairs and negotiations. He was afterwards admitted to the confidence of William prince of Orange; and died at Antwerp, on the 30th of September 1581. We have many of his letters written in Latin to Sir Philip Sidney, to Camerarius the father and son, and to Augustus elector of Saxony, which have been several times reprinted, in three volumes; and there is also attributed to him a famous treatise, intitled *Vindiciæ contra Tyrannos*, and other works. His life is written by Philibert de la Mare.

**LANGUET** (John Baptist Joseph), the celebrated vicar of St Sulpice at Paris, and a doctor of the Sorbonne, was born at Dijon in 1675. He was received into the Sorbonne in 1698; and attached himself to the community of St Sulpice, to which parish he was of great service. M. de la Chetardie the vicar, conscious of his talents, chose him for his curate, in which capacity he officiated near ten years; and in 1714, succeeded to the vicarage. His parish-church being small and out of repair, he conceived the design of building a church suitable to the size of his parish, which he began with the sum of 100 crowns, but soon obtained considerable donations; and the duke of Orleans, regent of the kingdom, granted him a lottery, and laid the first stone of the porch in 1718. It was consecrated in 1745, after M. Languet had spared neither labour nor expence to render it one of the finest churches in the world both for architecture and ornament. Another work which did him no less honour, was the *Maison de Pensant Jesus*. This establishment consists of two parts; the first composed of about 35 poor ladies of good families, and the second of more than 400 poor women and children of town and country. The order and economy in this house, for the education and employment of so many persons, gave cardinal Fleury so high an idea of the vicar of St Sulpice, that he proposed to make him superintendent-general of all the hospitals in the kingdom; which, however, was declined. Never man took more pains than he did to procure charitable donations and legacies, which he distributed with admirable discretion: he is said from good authority to have disbursed near a million of livres to the poor annually. When there was a general dearth

Lanius  
||  
Lanius.

dearth in 1725, he held, in order to relieve the poor, his household goods, pictures, and some curious pieces of furniture that he had procured with difficulty; and when the plague raged at Marseilles, he sent large sums into Provence for the relief of the distressed. M. Languet was not only singular in this warm, disinterested, benevolent conduct, but also in another circumstance equally rare; and this was in the refusal of several bishoprics that were offered him: he resigned even his vicarage in 1748; but continued to preach every Sunday at his own parish-church, and to support the *Maison de Penitence* till his death, which happened in 1750. It is observed, that his piety and charity did not proceed from poverty of talents; for he was sensible and lively in conversation, and his genius often discovered itself in his agreeable repartees.

LANGUOR, among physicians, signifies great weakness and loss of strength, attended with a dejection of mind; so that the patients can scarce walk, or even stand upright, but are apt to faint away.

LANIARD, (from *Lanier*, Fr.) a short piece of cord or line fastened to several machines in a ship, and serving to secure them in a particular place, or to manage them more conveniently. Such are the laniards of the gun-ports, the laniard of the buoy, the laniard of the cat-hook, &c.—The principal laniards used in a ship, however, are those employed to extend the shrouds and stays of the masts by their communication with the dead-eyes, so as to form a sort of mechanical power resembling that of a tackle.—These laniards are fixed in the dead-eyes as follows: one end of the laniard is thrust through one of the holes of the upper dead-eye, and then knotted, to prevent it from drawing out; the other is then passed through one of the holes in the lower dead-eye, whence, returning upward, it is inserted through the second hole in the upper dead-eye, and next through the second in the lower dead-eye, and finally through the third holes in both dead-eyes. The end of the laniard being then directed upwards from the lowest dead-eye, is stretched as stiff as possible by the application of tackles; and that the several parts of it may slide with more facility through the holes in the dead eyes, it is well smeared with hog's-lard or tallow, so that the strain is immediately communicated to all the turns at once.

LANIGEROUS, an appellation given to whatever bears wool.

LANISTA, in antiquity, is sometimes used to signify an executioner; but more frequently for a master-gladicator, who taught the use of arms, and had always people under them ready to exhibit shews of that kind. For this purpose, they either purchased gladiators, or educated children, that had been exposed, in that art.

LANIUS, the *SHRIKE*, or *Butcher-bird*, in ornithology, a genus belonging to the order of accipitres; the characters of which are these: The beak is somewhat straight, with a tooth on each side towards the apex, and naked at the base; and the tongue is lacerated. There are 26 species, distinguished by the shape of the tail and colour. The following are those known in Britain.

1. The excubitor, or greater butcher-bird, weighs three ounces: its length is 10 inches; its breadth 14: its bill is black, one inch long, and hooked at the end; the upper mandible furnished with a sharp process: the

nostrils are oval, covered with black bristles pointing downwards: the muscles that move the bill are very thick and strong; which makes the head very large. This apparatus is quite requisite in a species whose method of killing its prey is so singular, and whose manner of devouring it is not less extraordinary: small birds it will seize by the throat, and strangle; which probably is the reason the Germans call this bird *wur-changl*, or the suffocating angel. It feeds on small birds, young nestlings, beetles, and caterpillars. When it has killed the prey, it fixes them on some thorn, and when thus spitted pulls them to pieces with its bill: on this account the Germans call it *thorntraer* and *thornfricker*. We have seen them, when confined in a cage, treat their food in much the same manner, sticking it against the wires before they would devour it. Mr Edwards very justly imagines, that as nature has not given these birds strength sufficient to tear their prey to pieces with their feet, as the hawks do, they are obliged to have recourse to this artifice. It makes its nest with heath and moss, lining it with wool and gossamer; and lays six eggs, of a dull olive green, spotted at the thickest end with black.

The crown of the head, the back, and the coverts that lie immediately on the joints of the wings, are ash-coloured; the rest of the coverts black: the quill-feathers are black, marked in their middle with a broad white bar; and except the four first feathers, and the same number of those next the body, are tipped with white: the tail consists of 12 feathers of unequal lengths, the middle being the longest; the two middlemost are black, the next on each side tipped with white, and in the rest the white gradually increases to the utmost, where the colour has entire possession, or there remains only a spot of black: the cheeks are white, but crossed from the bill to the hind-part of the head with a broad black stroke: the throat, breast, and belly are of a dirty white: the legs are black. The female is of the same colour with the male, the breast and belly excepted, which are marked transversely with numerous semicircular brown lines.

2. The collurio, or lesser butcher-bird. The male weighs two ounces; the female two ounces two drams. The length of the former is seven inches and a half; the breadth eleven inches. The irides are hazel; the bill resembles that of the preceding species: the head and lower part of the back are of a fine light grey: across the eyes from the bill runs a broad black stroke: the upper part of the back, and coverts of the wings, are of a bright ferruginous colour; the breast, belly, and sides, are of an elegant blossom colour; the two middle feathers of the tail are longest, and entirely black; the lower part of the others white, and the exterior webs of the outmost feather on each side wholly so. In the female, the stroke across the eyes is of a reddish brown: the head of a dull rust-colour mixed with grey; the breast, belly, and sides, of a dirty white, marked with semicircular dusky lines: the tail is of a deep brown; the outward feather on each side excepted, whose exterior webs are white. These birds build their nests in low bushes, and lay six eggs of a white colour, but encircled at the bigger end with a ring of brownish red.

3. The woodchat in size seems equal to the preceding: the bill is horn-coloured; the feathers that surround



Lanner  
||  
Lantern.

furround the base are whitish; above is a black line drawn cross the eyes, and then downwards each side the neck; the head and hind part of the back are of a bright bay; the upper part of the back dusky, the coverts of the tail grey, the scapulars white; the coverts of the wings dusky, the quill-feathers black, marked towards the bottom with a white spot; the throat, breast, and belly, of a yellowish white. The two middle feathers appear to be entirely black; the exterior edges and tips of the rest white; the legs black. The female differs: the upper part of head, neck, and body, are reddish, striated transversely with brown; the lower parts of the body are of a dirty white, rayed with brown; the tail is of a reddish brown, marked near the end with dusky, and tipped with red.

**LANNER**, or **LANNAR**, the name of a bird of the long-winged hawk-kind, the male of which is called the *lannaret*. Its beak and legs are blue, and its head and neck variegated with large streaks of black and white. Its back, wings, and tail, are not variegated, except with a few small white spots, and its wings, when extended, are seen speckled underneath with small round white spots. Its neck is very short, as are also its legs. It is common in France, and abides there the whole year; it is very docile, and serves all the purposes of hawking. In Italy the species seems something different, having much of a yellowish brown about the shoulders, and being indocile, and of no use in sporting.

**LANDSOWNE** (Lord). See **GRANVILLE**.

**LANTANA**, **AMERICAN VIBURNUM**; a genus of the angiospermia order, belonging to the didymia class of plants. There are seven species, consisting of shrubby exotics from Africa and America for the green-house or stove; growing to the height of a yard or two, and adorned with oblong, oval, and roundish simple leaves, with monopetalous, tubular, four-parted flowers of different colours.—They may be propagated either by seeds or cuttings.

**LANTERN**, or **LANTHORN**, a device to carry a candle in; being a kind of cover usually made of white iron, with sashes of some transparent matter, as glass, horn, &c. to transmit the light.

**Dark LANTERN**, one with only one opening, which may also be closed up when the light is to be entirely hid, or opened when there is occasion for the assistance of the light to discover some object.

**Magic LANTERN**, an optic machine, whereby little painted images are represented so much magnified, as to be accounted the effect of magic by the ignorant. See **DIOPTRICS**, Art. ix. p. 2478.

**LANTERN**, in architecture, a little dome raised over the roof of a building, to give light, and serve as a crowning to the fabric.

The term *lantern* is also used for a square cage of carpentry, placed over the ridge of a corridor or gallery, between two rows of shops, to illumine them, like that of the royal exchange London.

**LANTERN**, on ship-board, a well-known machine, of which there are many in a ship, particularly for the purpose of directing the course of other ships in a fleet or convoy; such are the poop and top lanterns, &c.

**Fest of LANTERNS**, in China, is a celebrated feast held on the 15th day of the first month; so called

from the infinite number of lanterns hung out of the houses and streets; which, it is said, is not less than two hundred millions. On this day are exposed lanterns of all prices, whereof some are said to cost 2000 crowns.—Some of their grandees retrench somewhat every day out of their table, out of their dress, equipage, &c. to appear the more magnificent in lanterns. They are adorned with gilding, sculpture, painting, japanning, &c. And as to their size, it is extravagant; some being from 25 to 30 foot diameter: they represent halls and chambers, and two or three such machines together would make handsome houses; so that in China they are able to eat, lodge, receive visits, have balls, and act plays in a lantern. To illumine them, they should have bonfires; but as that would be inconvenient, they content themselves with lighting up in them an infinite number of torches or lamps, which at a distance have a beautiful effect. In these they exhibit various kinds of shews to divert the people.—Besides these enormous lanterns, there is a multitude of others smaller: these usually consist of six faces or lights, each about four feet high, and one and a half broad, framed in wood finely gilt and adorned; over these they stretch a fine transparent silk, curiously painted with flowers, trees, and sometimes human figures: the painting is very extraordinary, and the colours extremely bright; and when the torches are lighted, they appear highly beautiful and surprising.

**LANTERN-FLY**, in natural history, the name of a very singular kind of insect produced in the West Indies, and carrying a strong light with it in the night. The structure of the trunk of this insect is of the same kind with that of the cicada; and, as it wants the power of making the noise for which the cicada is so famous, it belongs, according to Mr Reaumur's distinctions, to that species of insect called the *proci-gale*, or *prociada*.

The glow-worm, and the luminous beetles, with all the other luminous insects we are acquainted with in this part of the world, diffuse their light from a part which is near the extremity of the body, and under the belly; but the lantern-fly gives it from its head. It differs also greatly in the degree of light: for this, in all the insects we are acquainted with, is very feeble; whereas in this fly it is so strong, that Mrs Morien, who is the first that hath well described it, says she could read a small print in a dark night by the light that one of them gave. The eyes of this creature are placed very near the part from whence the light issues; and it is commonly supposed that the use of the light is to show the creature the objects it passes by in its flight; but if we consider the effect of a light so placed, in regard to ourselves, we shall find, that it would by no means answer the same purpose to us. If our whole forehead was covered with a lambent flame in the night, it would rather blind us than shew us any distant objects.—The head of this creature, strictly speaking, is very short, not exceeding the length of one of the rings of the body, if it be measured from its joining with the corelet to its joining with the lantern; but if that part be accounted a portion of the head, then the head is equal in length to the whole body.—This lantern is wider than it is deep or thick; and has, near its origin, a large protuberance

Lantern.

berance, which gives it a bunched or humped look. There are several tubercles and lines on it of a reddish colour. The ground colour is an olive brown; and underneath, it has one large rib running all the way along it from end to end, dividing it in two; and by the sides of that there are some others. These are all reddish, and those nearest the edges have small rows of spines running along them. Over each of the eyes there is a round granulated prominence, which seems to have been a collection of smaller eyes; and if so, the animal is supplied with the organs of vision in a different manner from all other known creatures. But an examination of the creature on the spot, and while alive, is requisite to find out this. The upper pair of wings is not perfectly transparent; they are dotted with white in some places, and are variegated near their origin with several blackish spots. The under pair are more transparent than the upper; they are much shorter and broader than the others. These have each a large and beautiful round spot near the extremity, resembling that on the wing of the peacock butterfly. The colours of the circles of these eyes are brown and olive; the last colour very bright and clear, the other very dusky and obscure. The spots are so large, that they appear very beautiful.

LANUGO, the soft down of plants, like that growing on the fruit of the peach-tree. See HAIR.

LAODICEA on the *Lycus*, (anc. geog.), a town of Phrygia, at first called *Diopolis*, then *Rhoas*. It was built by Antiochus son of Stratonice, and called after his consort *Laodice*. Its memory is consecrated in scripture, being one of the seven churches to which St John in the Apocalypse addresses himself, commended by St Paul; the town is mentioned by Cicero as considerable for trading.

LAODICEA on the *Sea*, (anc. geog.), according to Strabo, was a town of Seleucia in Syria, extremely well built, with a commodious harbour. The country about it yielded great quantities of wine. The city took its name from *Laodice*, mother of Seleucus the founder of it.

LAOMEDON king of Troy, whose history is involved in fables. He built the famous walls round that city, and is said to have been killed by Hercules.

LAON, a considerable town of the Isle of France, and capital of the Laonis, with a castle and bishop's see. Its principal trade consists in corn and wine; and it is very advantageously seated on a mountain, in E. Long. 3. 42. N. Lat. 49. 34.

LAOS, a kingdom of Asia beyond the Ganges; bounded on the north, by China; on the east, by Tonquin and Cochinchina; on the south, by Cambodia; and on the west, by the kingdom of Siam, and by the territories of the king of Ava. This country is full of forests, and abounds in rice, fruits, and fish. The inhabitants are well made, robust, of an olive complexion, and mild in their disposition; but very superstitious, and much addicted to women. Their principal occupation is tilling the ground and fishing. The king shews himself but twice a-year, and has large revenues from the elephant's teeth found in his dominions. Their religion is a kind of idolatry, and much the same as in China. Langonia is the capital town.

LAPIDARY, an artificer, who cuts precious  
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stones.

The art of cutting precious stones is of great antiquity. The French, though they fell into it but lately, have notwithstanding carried this art to a very great perfection, but not in any degree superior to the English.

There are various machines employed in the cutting of precious stones, according to their quality: the diamond, which is extremely hard, is cut on a wheel of soft steel, turned by a mill, with diamond-dust, tempered with olive-oil, which also serves to polish it.

The description of the diamond-cutter's wheel or mill, as represented in Plate CLXI. fig. 8. is as follows: *a* is the pincers; *b*, the screw of the pincers; *c*, the shell that carries the mallet and the diamond; *d*, the mallet that softens the diamond at the end of the shell; *e*, the diamond presented to the wheel, to be cut facetwise; *f*, the iron-wheel turning on its pivot; *g*, iron-pegs, to fix and keep the pincers steady; *h*, small pegs of lead of different weights, wherewith the pincers are loaded at pleasure to keep them steady; *i*, a wooden wheel; *k*, the axis of the wheel. It is beveled, and makes an elbow under the wheel, to receive the impulsion of a bar that does the office of a turning handle; *l*, the sole, or square piece of steel, wherein the pivot of the tree or axis moves; *m*, the turning handle, that sets the wheel a-going by means of the elbow of its axis; the elbow of the piercer wherewith a hoghead is broached, will give an idea of this kind of motion; *n*, the cat-gut string that goes round both the iron and the wooden wheels. If the wooden wheel is twenty times larger than the iron one, the latter shall make twenty turns upon the diamond, whilst the large wheel makes but one round its axis; and whilst the boy gives, without any resistance, a hundred impulsions to the turning handle, the diamond experiences a thousand times the friction of the whole grinding wheel.

The diamond-cutter follows the work with his eyes, without taking any other share in it than that of changing the place of the diamond to bite on a new surface; and of timely throwing upon it, with a few drops of oil, the minute particles of the diamonds first ground one against the other, to begin the cutting of them.

The oriental ruby, sapphire, and topaz, are cut on a copper-wheel with diamond dust tempered with olive-oil, and are polished on another copper wheel with tripoli and water. The hyacinth, emerald, amethyst, garnets, agates, and other stones not of an equal degree of hardness with the other, are cut on a leaden wheel with small water, and polished on a tin-wheel with tripoli. The turquois of the old and new rock, girasol, and opal, are cut and polished on a wooden wheel with tripoli also.

The lapidaries of Paris have been a corporation since the year 1290. It is governed by four jurats, who superintend their rights and privileges, visit the master-workmen, take care of the master-piece of workmanship, bind apprentices, and administer the freedom.

LAPIS, in general, is used to denote a stone of any kind.

LAPIS, in Roman antiquity, a geographical measure denoting a mile; because miles were distinguished

Lapis  
||  
Lapland.

ed by erecting a stone at the end of each; from the number marked on which, the length of way from Rome might be known. The device is by Plutarch ascribed to Caius Gracchus. This was more accurately executed by Augustus, who erected a gilt pillar in the forum, at which all the public ways of Italy, distinguished by stones, were terminated. The same thing was done in the Roman provinces. Hence the phrases *tertius lapis*, *centesimus lapis*, &c. for three, a hundred, &c. miles; and sometimes the ordinal number without *lapis*, as *ad duodecimum*, &c. at twelve miles distance.

*LAPIS Affius*, in the natural history of the ancients, the name of a stone called also *farcephagus*, from its power of consuming flesh. See *SARCOPHAGUS*.

*LAPIS Bononiensis*, the Bolognian stone. See *CHEMISTRY*, n° 339, 340.

*LAPIS Lazuli*. See *LAZULI*.

*LAPIS Lyncurium*. See *AGARICUM* and *LYNCURIUM*.

*LAPIS Nephriticus*. See *STEATITES*.

*LAPIS Specularis*. See *SPECULARIS*.

*LAPITHÆ*. See *PELETHRICUM*.

**LAPLAND**, the most northerly country of Europe, extending from the north cape in  $71^{\circ} 30' N$ . Lat. to the White Sea under the arctic circle, is inhabited by the same people, though the country is subject to different powers. Norwegian Lapland, under the dominion of Denmark, lies between the northern sea, the river Pais, and the lake Enarak. Swedish Lapland comprehends all the country from the Baltic to the mountains that separate Norway from Sweden. It is divided into six districts, denominated *mark* or territory; and these are distinguished by the names of rivers, such as Augnermanland, Elma, Peta, Lula, Torna, and Kiemi. The eastern part, subject to the Czar of Muscovy, situated between the lake Enarak and the White Sea, is divided into three distinct prefectures; namely, that of the sea-coast towards the north, called *Mourmankoi Leporie*; the Terskoi Leporie, upon the coast of the White Sea; and the third, or inland, known by the name of *Bellankoi Leporie*. In Swedish Lapland, which is the most considerable of the three, the provinces or marks are subdivided into smaller districts called *biars*, consisting each of a certain number of families; among which the land is parcelled out by government, or the prefect of the district appointed by the king of Sweden.

Lapland may be termed a huge congeries of frightful rocks and stupendous mountains; interspersed, however, with many pleasant valleys, watered by an infinite number of rivulets that run into the rivers and lakes, which discharge themselves into the gulf of Bothnia. The names of the principal lakes in Lapland are the Great Uma, the Great Windel, the Oreavan, the Stor-avan, the Great Lula; the lakes of Kartom, Kali, Torno, Enara, and Kimi. Some of these extend 60 leagues in length, and contain a great number of islands: Stor-avan is said to contain 365; and Enara contains an archipelago of islands so large, that no Laplander has lived long enough to visit each particular island. The natives believe this country to be the terrestrial paradise; and indeed nothing could be more enchanting than such vast prospects of mountains, hills, forests, lakes, rivers, &c.

if the country was in a moderate climate; and indeed, even here, in summer the roses are seen blowing wild on the banks of the lakes and rivers, with all the beautiful glow of colour which appears in those cultivated in our gardens. But all the intervals between the mountains are not engrossed by these agreeable prospects; great part of the flat country is covered with brown dusky forests of fir and pine trees; and these are often skirted by wide extended morasses, the stagnating waters of which in summer produce myriads of mischievous insects, that are more intolerable than even the cold of winter.

The cold of Lapland is very intense during the winter, freezing even brandy and the watery part of spirit of wine, if the latter is not highly rectified: the very breath freezes in expiration; and the limbs of people are often mortified, and perish; all the lakes and rivers are frozen to a prodigious thickness; and the whole face of the country is covered with snow to the depth of four or five feet. While this continues loose, it is impossible to travel; for a man's eyes are not only blinded with it, but if a strong wind should rise he will be buried in the drifts of snow: yet should a partial thaw take place for a few hours, the surface of this snow is formed by the succeeding frost into a hard impenetrable crust, over which the Laplander travels in his sledge with great celerity. While the thaw prevails, the air is furcharged with vapours, and the climate is rainy; but while the north wind blows, the sky is beautifully serene, and the air very clear.

The heat of summer is almost as intolerable in Lapland as the cold of winter. At the northern extremity of the country the sun never sets for three months in summer, and in winter there is an uninterrupted night of the same duration; but this is qualified in such a manner by a constant revolution of dawn and twilight, by a serene sky, moon-light, and aurora borealis, reflected from the white surface of the earth covered with snow, that the inhabitants are enabled to hunt, fish, and proceed with their ordinary occupations. The country abounds with excellent springs; and is remarkable for some surprising cataraets, in which the water rumbles over frightful precipices, and dashes among rocks with amazing impetuosity and noise.

The soil of Lapland is generally so chilled and barren, that it produces little or no grain or fruit-trees of any kind. This fertility, however, is not so much owing to the soil, which is in many places of a rich mould, as to want of industry; for in some districts the Swedes have tilled and manured pieces of ground that bear plentiful crops of rye. There is also great plenty of berries: such as black currants; what is called the Norwegian mulberry, growing upon a creeping plant, and much esteemed as an antiscorbutic; rasp-berries, cran-berries, juniper-berries, and bilberries. The tops of the mountains are so much exposed to intense cold, and tempests of snow and hail, that no tree will grow near the summit; but in parts that are more sheltered, we see fine woods of birch, pine, and fir, disposed by nature as if they had been planted by art in rows at regular distances, without any undergrowth or incumbrance below. Besides these trees, some parts of Lapland produce the service-tree, the willow, the poplar, the elder, and the cornel. Among the plants



Lapland. of this country the principal is the angelica; which is greatly esteemed by the natives, who use it in their food. Here is likewise the acetosa or sorrel, which grows in great plenty, and is of much service on account of its antiscorbutic properties. They have also other kinds of herbs peculiar to the country, different kinds of grafs, heath, and fern; which are all enumerated in a work of the celebrated Linnæus, intitled *Flora Laponica*. But the vegetable which is in greatest plenty, and of the most extensive use among them, is the moss; of which there are many different species, either adhering to trees, or growing on the surface of the earth. The rein-deer is almost wholly sustained by this vegetable; which indeed he prefers to all others, and without which he cannot subsist. The Laplanders not only use it as forage to their cattle, but boil it in broth as a cordial and restorative. They likewise use one sort of it as a soft, easy, and wholesome bed for their new-born children.

Some silver and lead mines have been discovered in the provinces of Pitha and Lula; and two of copper, together with excellent veins of iron, in the district of Torno; but they are not at present worked with any considerable advantage. In some places there are veins of silver and gold mixed; but these mines are worked only for a few months in the summer, because the frost hinders the engines from playing. Here are found beautiful crystals, of a surprising magnitude, so hard and fine, that when polished they resemble real diamonds. In some places amethysts and topazes are also found, but pale and cloudy; also a great quantity of very curious stones, which are too hard to be worked by the tool of the mason. Some of these found on the banks of rivers and lakes, when they happen to bear the least resemblance to the figures of animals, the Laplanders remove to more conspicuous places, and adore as deities. The province of Torno affords some curious stones of an octagonal shape, regular, shining, and polished by the hand of nature. In some rivers they fish for pearls, which are generally pale; but some of them are as bright as the oriental pearls, and much larger and rounder. These pearls are found in muscle-shells; and the fishery is not in the sea, but in rivers.

Lapland, as well as Norway, is infested with a great number of grey wolves and bears, with whom the inhabitants wage perpetual war. The most honourable exploit among the Laplanders is that of killing a bear; and the heroes adorn their caps with a small plate of lead or pewter for every bear they have slain. The country abounds also with elks, beavers, and otters, which live here unmolested, and find plenty of fish for their subsistence. The skins of the black foxes in Lapland are of such estimation, that a single one will sell at Moscow for 12 golden crowns. The forests of this country furnish haunts to a great number of beautiful martens and squirrels; which last change their colour every winter from brown to grey. These animals frequently migrate in vast multitudes. When they arrive at the side of a lake, they embark on pieces of timber or bark, which they find afloat, and are generally drowned on their passage: the bodies are cast ashore, and the skin becomes a prey to the first finder. What should induce these animals to quit the country and to undertake such hazardous voyages, hath not yet

been discovered.

Lapland is also the native country of the zibelling, a creature resembling the martin, whose skin, whether black or white, if glossy, is extremely valuable, and often given in presents by the ambassadors of Muscovy to the princes at whose courts they reside. Here are likewise ermines, weasels, hares which grow white in winter, large black cats which attend the Laplanders in hunting, and little prick-eared curs trained to the game. But the most remarkable animal of Lapland is the rein-deer, of which an account is given in the article CERVUS, n° 4.—The woods, mountains, and rivers are well stocked with wild-fowl; such as bustard, partridge, grouse, heathcock, pheasants, lapwings, swans, wild-geese, wild-ducks, and all sorts of aquatic birds that build and breed in northern climates. In the beginning of the spring the swans go thither in numerous flights from the German ocean; the lapwings follow in such swarms that they darken the sky as they pass along, and scream so loud that they may be heard at a great distance. The rocks and mountains are likewise frequented by eagles, hawks, falcons, kites, and other birds of prey.—The rivers abound with delicious salmon from the gulph of Bothnia, trout, bream, and perch of exquisite flavour and amazing magnitude; and the inhabitants of Wardhus, or Danish Lapland, are well supplied with fish from the northern ocean.—With respect to insects, the flies hatched in the morasses and woods in summer are so numerous, that they often obscure the face of day; so venomous, troublesome, and intolerable, that the reindeer fly to the tops of the highest mountains for shelter, and the Laplanders betake themselves to the seaside, which is the least infested by these pestilent vermin. M. de Maupertuis, in his account of the voyage he made to Lapland, in company with the other French mathematicians sent thither by the king to measure a degree of the meridian, gives us to understand, that on the tops of the mountains in Torno the flies were so troublesome, that even the Finland soldiers, who are counted the most hardy troops in the service of Sweden, were obliged to cover their faces with the skirts of their coats, from the attacks of these animals, which swarmed to such a degree, that the moment a piece of flesh appeared it was blackened all over. Some of these flies are very large, with green heads, and fetch blood from the skin wherever they strike. The Laplanders shroud themselves in the smoke of a large fire kindled for that purpose; yet even this disagreeable expedient was not sufficient to defend the French philosophers: they were obliged, notwithstanding the excessive heat, to wrap up their heads in garments made of the skins of rein-deer, called in that country *lapnades*, and to cover themselves with a thick rampart of birch-boughs; yet all these precautions proved ineffectual. M. de Maupertuis observed a lake quite covered with little yellowish grains, resembling millet seed, which he supposed to be the chrysalides of some of these insects.

Lapland is so far from being populous, that the whole nation is not equivalent in number to the inhabitants of one petty province of France. The Laplanders are very low in stature, generally about a head shorter than other Europeans. They are likewise remarkable for having large heads. M. de Maupertuis

Lapland. measured a female Laplander who suckled her own child, and found her stature did not exceed four feet two inches and five lines. They are also ill-shaped and ugly: yet strong, hardy, and robust, inasmuch that will bear incredible fatigue; and it is remarked that the stoutest Norwegian is not able to bend the bow of a Laplander. The women, however, are much less homely than the men, and many of them are noted for a delicate and florid complexion.

These people are simple, honest, hospitable, and timorous: their timidity, however, respects war alone; for to many other species of dangers they expose themselves with surprising intrepidity, whether in ascending and descending mountains and precipices with their snow-shoes and in sledges, or in venturing amidst whirlpools and cataracts in little slender boats made of thin fir-boards, fastened together with thongs of leather, sinews of wild beasts, or tough and flexible twigs of willow and osier. These boats are of different sizes, from two to six yards in length, managed with oars, and caulked with moss, so tight as to keep out the water. The Laplanders are more or less civilized as they communicate with strangers, or live among woods and forests sequestered from all correspondence. The mountaineers live chiefly on the flesh and on the milk of the rein-deer; the flesh they dry in the cold, and from the milk they make abundance of cheese. Those who live in the low country feed on venison and fish. They have neither bread nor salt; but in lieu of both use the inner rind of the pine-tree dried and ground, and dried fish reduced to powder. They make confections and decoctions of berries, angelica, and fennel, which they justly reckon to be preservatives against the scurvy. They make broth of fish and flesh boiled together; and their usual drink is water heated in a kettle which hangs continually over the fire in winter. Their greatest dainty, however, is bear's flesh, which they eat on all great festivals. On these occasions also they indulge themselves with brandy, and are never so happy as when they can enjoy a pipe of tobacco. These commodities, together with a few cows and sheep for their winter store, the better sort of Laplanders purchase from Norway.

They lodge in wretched houses composed of rafters joined together, and covered partly with turf, and partly with the boughs or bark of pine-trees, and a coarse kind of cloth. Each hut is furnished with two doors, one smaller than the other: at the former the men fall forth to their hunting and other occupations; but no woman is permitted to make use of this entry, lest she should meet the man in his outgoing, which their superstition interprets into a very bad omen. They have neither chimney nor window; but a hole at the top, which lets in the light and lets out the smoke. In a word, these habitations are no more than miserable hovels, without convenience or comfort; in which the people sit or lie promiscuously like beasts around the fire, enveloped in a thick impenetrable gloom of acrid smoke, which corrodes their eyes and renders the atmosphere altogether unfit for respiration. Yet even here the poor Laplander enjoys life with some degree of relish: he has his fash, his diversions, and his amours. He is secured in the possession of uninterrupted health by temperance and exercise, which, together with the severity of the cli-

mate, brace his nerves to a very unusual pitch of strength, and fortify his constitution in such a manner, that he often lives to the age of 100, without feeling the least pang of distemper, or even perceiving his vigour in the least impaired; for it is not uncommon to see a Laplander in extreme old age hunting, fowling, skating, and performing all the severest exercises with undiminished agility.

The summer-garb of the men consists of a long coat of coarse cloth, reaching down the middle of the leg, and girded round the waist with a belt or girdle; from which hang a Norway knife, and a pouch containing flints, matches, tobacco, and other necessities; the girdle itself being decorated with brass rings and chains. Their caps are made of the skin of the northern diver, with the feathers on; and their shoes of the rein-deer skin, with the hair outwards. They wear no linen; but the garments of the better sort are of a finer cloth, and they delight in a variety of colours, though red, as the most glaring, is the most agreeable. In winter they are totally cased up in coats, caps, boots, and gloves, made of the rein-deer skins with the hair inwards. The women's apparel differs very little from that of the other sex; only their girdles are more ornamented with rings, chains, needle-cases, and toys that sometimes weigh 20 pounds. In winter, both men and women lie in their furs; in summer, they cover themselves entirely with coarse blankets to defend them from the gnats which are intolerable. The Laplanders are not only well disposed, but naturally ingenious. They make all their own furniture, their boats, sledges, bows and arrows. They form neat boxes of thin birch-boards, and inlay them with the horn of the rein-deer. The Swedes are very fond of the Lapland baskets made of the roots of trees, slit in long thin pieces, and twisted together so nicely that they will hold water. Among the manufactures of this country we likewise number curious horn-spoons, and moulds in which they cast the trinkets of tin which adorn their girdles. Over and above these domestic occupations, the men within doors perform the office of cooks, in dressing victuals for the family. The women act as tailors and embroiderers; they make clothes, shoes and boots, and harness for the rein-deer: they spin thread of fur, and knit it into caps and gloves, that are very soft and warm. They draw tin into wire through a horn; and with this they cover the thread which they use in embroidering the figures of beasts, flowers, trees, and stars upon their caps and girdles.

The Laplanders make surprising excursions upon the snow in their hunting expeditions. They provide themselves each with a pair of skates, or snow-shoes, which are no other than fir-boards covered with the rough skin of the rein-deer turned in such a manner that the hair rises against the snow, otherwise they would be too slippery. One of these shoes is usually as long as the person who wears it; the other is about a foot shorter. The feet stand in the middle, and to them the shoes are fastened by thongs or withes. The Laplander thus equipped wields a long pole in his hand, near the end of which there is a round ball of wood, to prevent its piercing too deep in the snow; and with this he stops himself occasionally. By means of these accoutrements he will travel at the rate of 60 miles a-day without being fatigued; ascending steep

mountain-

Lapland. mountains, and sliding down again with amazing swiftness.

The Laplander not only travels a-foot, but is provided with a carriage drawn by the rein-deer, in which he journeys with still greater rapidity. The sledge, called *pulka*, is made in the form of a small boat, with a convex bottom, that it may slide the more easily over the snow: the prow is sharp and pointed; but the sledge is flat behind. The traveller is swathed in this carriage like an infant in a cradle, with a flick in his hand, to steer the vessel, and disengage it from pieces of rock or stumps of trees that may chance to encounter it in the route. He must also balance the sledge with his body, otherwise he will be in danger of being overturned. The traces, by which this carriage is fastened to the rein-deer, are fixed to a collar about the animal's neck, and run down over the breast, between the fore and hind legs, to be connected with the prow of the sledge: the reins, managed by the traveller, are tied to the horns; and the trappings are furnished with little bells, the sound of which is agreeable to the animal. With this draught at his tail, the rein-deer will fly like lightning over hill and dale, so as to run at the rate of 200 miles a-day. Before he sets out, the Laplander whipsers in his ear the way he is to follow, and the place at which he is to halt; firmly persuaded, that the beast understands his meaning: but, in spite of this intimation, he frequently stops short, long before he has reached the journey's end; and sometimes he overshoots the mark by several leagues. The posture of a man in one of these pulkhas is half-sitting and half-lying, so as to be extremely confined and uneasy. In the beginning of winter, the Laplanders mark the most frequented roads, by strewing them with fir-boughs; and, indeed, these roads are no other than pathways made through the snow by the rein-deer and the pulkhas: their being frequently covered with new snow, and alternately beaten by the carriage, consolidates them into a kind of causeway; which is the harder, if the surface has felt a partial thaw and been cruised by a subsequent frost. It requires great caution to follow these tracks; for, if the carriage deviates to the right or left, the traveller is plunged into an abyss of snow. In less frequented parts, where there is no such beaten road, the Laplander directs his course by certain marks which he has made on the trees; but, notwithstanding all his caution, the rein-deer very often links up to the horns in snow. Should a hurricane arise, the snow would be whirled about in such a manner as to blind and overwhelm the traveller, unless he should be provided with a tent to screen him in some measure from the fury of the tempest.

The chief occupation of the Laplanders is hunting, and this exercise they perform in various ways. In summer, they hunt the wild beasts with small dogs, drained to the diversion. In winter, they pursue them by their tracks upon the snow, skating with great velocity, that they very often run down the prey. They catch ermines in traps, and sometimes with dogs. They kill squirrels, martens, and fables, with blunt darts, to avoid wounding the skin. Foxes and beavers are slain with sharp-pointed darts and arrows; in shooting which, they are accounted the best marksmen in the world. The larger beasts, such as bears, wolves,

elks, and wild rein-deer, they either kill with fire-arms purchased in Sweden or Norway, or taken in snares and pits dug in the forests. Their particular laws, relating to the chase, are observed with great punctuality. The beast becomes the property of the man in whose snare or pit he is caught; and he who discovers a bear's den, has the exclusive privilege of hunting him to death. The conquest of a bear is the most honourable achievement that a Laplander can perform; and the flesh of this animal they account the greatest delicacy on earth. The bear is always dispatched with a fusi, sometimes laid as a snare, ready cocked and primed; but more frequently in the hands of the hunter, who runs the most imminent risk of his life, should he miss his aim of wounding the beast mortally. The death of a bear is celebrated by the Laplanders as a signal victory. The carcass is drawn to the cabin or hut of the victor by a rein-deer, which is kept sacred from any other work for a whole year after this service. The bear is surrounded by a great number of men, women, and children, reciting a particular hymn or song of triumph; in which they thank the vanquished enemy for having allowed himself to be overcome without doing any mischief to his conqueror, and welcome his arrival: then they make an apostrophe to heaven, expressing their acknowledgment to God, that he has created beasts for the use of men, and endued mankind with strength and courage to overcome and attack the fiercest of the brute creation. The hero is saluted by the women, who spit chewed elderbark in his face. He is feasted three days successively, and his cap is decorated with an additional figure wrought in tin-wire.

The manner in which the young Laplander chooses a wife is equally remarkable and ludicrous. When he has pitched upon a female, he employs some friends as mediators with the father; and these being provided with some bottles of brandy, the suitor accompanies them to the hut of his future father-in-law, who invites the mediators to enter; but the lover is left without, until the liquor be drank and the proposal discussed: then he is called in, and entertained with such fare as the hut affords; yet without seeing his mistress, who retires and goes out on this occasion. Having obtained leave of her parents to make his address in person, he puts on his best apparel, and is admitted to the lady, whom he salutes with a kiss: then he presents her with the tongue of a rein-deer, a piece of beaver's flesh, or some other sort of provision. She declines the offer, which is made in presence of her sisters and relations; but makes a signal to the lover to follow her into the fields, where she accepts the presents. Thus encouraged, he begs her permission to sleep with her in the hut: if she consents, there is no further difficulty; if she disapproves of the proposal, she drops her presents on the ground. When the lovers are agreed, the youth is permitted to visit his inamorata as often as he shall think proper: but every time he comes, he must purchase this pleasure with a fresh bottle of brandy; a perquisite so agreeable to the father, that he often postpones the celebration of the nuptials for two or three years. At length the ceremony is performed at church, by the priest of the parish. Even after this event, the husband is obliged to serve his father-in-law a whole year; at the expiration of



Lapland.

of which he retires to his own habitation with his wife, and her patrimony of rein-deer, and receives presents from all his friends and relations. From this period he sequesters his wife from the company of all strangers, especially of the male sex, and watches over her conduct with the most jealous vigilance.

Many Lapland women are barren, and none of them are very fruitful. A woman, immediately after delivery, swallows a draught of whale-fat: the child is washed with snow or cold water, and wrapped up in a hare-skin. The mother is seldom above five days in the straw, and in fourteen is generally quite recovered: then she carries the child to church to be baptized. Before she can reach the residence of the priest, she is often obliged to traverse large forests, mountains, lakes, and wide-extended wastes of snow. The infant is fastened in a hollowed piece of wood, stretched naked on a bed of fine moss, covered with the soft skin of a young rein-deer, and slung by two straps to the back of the mother, who always suckles her own child. At home this little cradle is hung to the roof of the hut, and the child lulled asleep by swinging it from one side to the other. The boys, from their infancy, practise the bow; and are not allowed to break their fast, until they have hit the mark. The female children are as early initiated in the business peculiar to their sex.

These people, though for the most part vigorous and healthy, are not altogether exempted from distemper. They are subject to sore eyes, and even to blindness, from the smoke of their huts, and the fire to which they are almost continually exposed. Some waste away in consumptions; others are afflicted with rheumatic pains, and the scurvy; and a few are subject to vertigo and apoplexy. For the cure of all their internal disorders, they use no other medicine than the decoction of a certain species of moss; and, when this cannot be procured, they boil the stalk of angelica in the milk of the rein-deer. In order to remove a fixed pain, they apply a large mushroom, burning hot, to the part affected; and this produces a blister, which is supposed to draw off the peccant humour. To their wounds they apply nothing but the turpentine that drops from the fir-tree. When they are frost-bitten, they thrust a red-hot iron into a cheese made of rein-deer's milk, and with the fat that drops from it anoint the frozen member, which generally recovers. When a Laplander is supposed to be on his death-bed, his friends exhort him to die in the faith of Christ, and bear his sufferings with resignation, by remembering the passion of our Saviour. They are not, however, very ready to attend him in his last moments; and as soon as he expires, quit the place with precipitation, apprehending some injury from his spirit or ghost, which they believe remains with the corpse, and takes all opportunities of doing mischief to the living. The deceased is wrapped up in woollen or linen, according to his circumstances, and deposited in a coffin by a person selected for that purpose: but this office he will not perform, unless he is first secured from the ill offices of the manes, by a consecrated brafs ring fixed on his left arm. The Christian religion in this country has not yet dispelled all the rites of heathenish superstition: together with the body they put into the coffin an ax, a flint, and steel, a stalk of brandy, some

dried fish and venison. With the ax the deceased is supposed to hew down the bushes or boughs that may obstruct his passage in the other world: the steel and flint are designed for striking a light, should he find himself in the dark at the day of judgment; and on the provision they think he may subsist during his journey.

The Muscovite Laplanders observe other ceremonies, that bear an affinity to the superstitions of the Greek church. They not only supply the deceased with money, but likewise provide him with money for the porter of paradise, and a certificate signed by the priest, and directed to St Peter, specifying, that the bearer had lived like a good Christian, and ought to be admitted into heaven. At the head of the coffin they place a little image of St Nicholas, who is greatly revered in all parts of Muscovy as a friend to the dead. Before the interment, the friends of the deceased kindle a fire of fir-boughs near the coffin, and express their sorrow in tears and lamentations. They walk in procession several times round the body, demanding, in a whining tone, the reason of his leaving them on earth. They ask whether he was out of humour with his wife; whether he was in want of meat, drink, clothing, or other necessities; and whether he had not succeeded in hunting and fishing? These, and other such interrogations, to which the deceased makes no reply, are intermingled with groans and hideous howlings; and, between whiles, the priest sprinkles the corpse and the mourners alternately with holy water. Finally, the body is conveyed to the place of interment on a sledge, drawn by a rein-deer; and this, together with the cloaths of the deceased, are left as the priest's perquisite. Three days after the burial, the kinsmen and friends of the deceased are invited to an entertainment, where they eat the flesh of the rein-deer which conveyed the corpse to the burying-ground. This being a sacrifice to the manes, the bones are collected into a basket and interred. Two thirds of the effects of the deceased are inherited by his brothers, and the remainder divided among his sisters: but the lands, lakes, and rivers, are held in coparceny by all the children of both sexes, according to the division made by Charles IX. of Sweden, when he assigned a certain tract of land to each family.

The commerce of the Laplanders is more considerable than one would expect in a desert country inhabited by a savage ignorant people. They export great quantities of fish to the northern parts of Bothnia and White Russia. They likewise trade with the neighbouring countries of Norway, Sweden, Muscovy, and Finland, by selling rein-deer, fine furs, baskets and toys of their own manufacture, dried pikes, and cheese made of the rein-deer's milk. In return for these commodities they receive rixdollars, woollen cloaths, linen, copper, tin, flour, oil, hides, needles, knives, spirituous liquors, tobacco, and other necessities. The Laplanders march in caravans to the fairs in Finland and Norway: these are composed of a long string of 30 or 40 rein-deer and pulkhas, tied to one another, the foremost being led by a Laplander a-foot. When they have chosen a spot for an encampment, which is often in the midst of a river, they form a large circle of their rein-deer and pulkhas ready yoked;

Lapland.

Laplysia  
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Larceny.

yoked; and the animals, lying down quietly on the snow, are fed with moss by their masters. The people kindle great fires, around which, men, women, and children sit, and sup on dried fish; but the more voluptuous pitch their tents on the ice, and spread their bear-skins, on which they lie at their ease, and smoke tobacco.

The revenue arising from this country is of no great consequence: it is paid partly in rix-dollars, but chiefly in furs; nay, some, that can procure neither, pay the tribute in dried pikes. The produce of the mines forms likewise a considerable article. Fifty squirrel-skins, or one fox-skin, with a pair of Lapland shoes, are valued at one rixdollar. Part of the taxes is allotted for the maintenance of the Lapland clergy.

The frightful aspect of this country has been deemed a more effectual defence than artificial bulwarks and garrisons, of which here are none; or than the arms and courage of the natives, who are neither warlike in themselves, nor in the least tinctured with discipline.

LAPLYSIA, a genus of marine insects, belonging to the order of vermes mollusca. The body is covered with membranes reflected. It hath a shield-like membrane on the back, a lateral pore on the right side; the vent on the extremity of the back, with four feelers resembling ears. The figure shews the common size. Those of Italy grow to the length of eight inches. Pliny callit *ossa informis*; and, placing it among the venomous marine animals, says that even the touch is infectious. The smell is extremely nauseous.

LAPSANA, NIPPLEWORT; a genus of the polygamia æqualis order, belonging to the syngenesia class of plants. There are four species, which grow commonly as weeds by the sides of ditches. The young leaves of the common kind, called *dock-cresses*, have the taste of radishes, and are eaten raw at Constantinople as a salad. In some parts of England the common people boil them as greens, but they have a bitter and disagreeable taste.

LAPWING, in ornithology. See TRINGA.

LAQUEUS, in surgery, a kind of ligature, so contrived, that, when stretched by any weight or the like, it draws up close. Its use is to extend broken or disjunct bones to keep them in their places while they are set, and to bind the parts close together.

LAR-BOARD, among seamen, the left-hand side of the ship when you stand with your face towards the head.

LARCENY, or THEFT, by contraction for *latro-ceny*, *latrocinium*, is distinguished by the law into two sorts: the one called *simple larceny*, or plain theft unaccompanied with any other atrocious circumstance; and *mixed or compound larceny*, which also includes in it the aggravation of a taking from one's house or person.

1. *Simple larceny*, when it is the stealing of goods above the value of twelvecence, is called *grand larceny*; when of goods to that value, or under, is *petit larceny*: offences, which are considerably distinguished in their punishment, but not otherwise. See THEFT.

II. *Mixed, or compound larceny*, is such as has all the properties of the former, (see THEFT;) but is

accompanied with either one, or both, of the aggravations of a taking from one's house or person. First therefore of larceny from the house, and then of larceny from the person.

1. Larceny from the house, though it might seem to have a higher degree of guilt than simple larceny, yet is not at all distinguished from the other at common law: unless where it is accompanied with the circumstance of breaking the house by night; and then it falls under another description, viz. that of burglary, (see BURGARY). But now by several acts of parliament (the history of which is very ingeniously deduced by a learned modern writer †, who hath shewn them to have gradually arisen from our improvements in trade and opulence) the benefit of clergy is taken from larcenies committed in an house in almost every instance: except that larceny of the stock or utensils of the plate-glass company from any of their houses, &c. is made only single felony, and liable to transportation for seven years. The multiplicity of the general acts is apt to create some confusion; but upon comparing them diligently we may collect, that the benefit of clergy is denied upon the following domestic aggravations of larceny; viz. first, in larcenies above Blackf. the value of twelvecence, committed, 1. In a church or chapel, with or without violence, or breaking the same: 2. In a booth or tent in a market or fair, in the day-time or in the night, by violence or breaking the same; the owner or some of his family being therein: 3. By robbing a dwelling-house in the day-time (which *robbing* implies a breaking), any person being therein: 4. In a dwelling-house by day or by night, without breaking the same, any person being therein and put in fear; which amounts in law to a robbery: and in both these last cases the accessory before the fact is also excluded from his clergy. Secondly, in larcenies to the value of five shillings, committed, 1. By breaking any dwelling house, or any out-house, shop, or warehouse thereunto belonging, in the day-time, although no person be therein; which also now extends to aiders, abettors, and accessories before the fact: 2. By privately stealing goods, wares, or merchandise in any shop, warehouse, coach-house, or stable, by day or by night; though the same be not broken open, and though no person be therein: which likewise extends to such as assist, hire, or command the offence to be committed. Lastly, in larcenies to the value of forty shillings in a dwelling-house, or its out-houses, although the same be not broken, and whether any person be therein or not; unless committed against their masters by apprentices under the age of 15. This also extends to those who aid or assist in the commission of any such offence.

2. Larceny from the person is either by privately stealing; or by open and violent assault, which is usually called robbery.

The offence of *privately* stealing from a man's person, as by picking his pocket or the like, privily, without his knowledge, was debarred of the benefit of clergy, so early as by the statute 8 Eliz. c. 4. But then it must be such a larceny, as stands in need of the benefit of clergy, viz. of above the value of 12d.; else the offender shall not have judgment of death. For the statute creates no new offence; but only takes away the benefit of clergy, which was a matter of grace, and

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† Barr. 375.

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and leaves the thief to the regular judgment of the ancient law. This severity (for a most severe law it certainly is) seems to be owing to the ease with which such offences are committed, the difficulty of guarding against them, and the boldness with which they were practised (even in the queen's court and presence) at the time when this statute was made: besides that this is an infringement of property in the manual occupation or corporal possession of the owner, which was an offence even in a state of nature. And therefore the *faccularii*, or cutpurfs, were more severely punished than common thieves by the Roman and Athenian laws.

As to open and violent larceny from the person, see ROBBERY.

LARDNER (Nathaniel), an eminent English dissenting divine, born in 1656, was author of several excellent works in defence of our religion; as, Testimonies of the ancient Jews and Pagans in favour of Christianity; The history of heretics, &c. He died in 1678.

LAR, a town of Persia, in the province of Fars, with a castle. It carries on a great trade in silk; and its territory abounds in oranges, lemons, and very large tamarinds. E. Long. 54. 15. N. Lat. 27. 30.

LARACHA, an ancient and strong town of Africa, in the kingdom of Fez. It is seated at the mouth of a river of the same name, with a good harbour. It was once in the possession of the Spaniards; but the Moors took it from them. W. Long. 5. 55. N. Lat. 35. 0.

LAREDO, a sea-port town of Spain, in the bay of Biscay, with a large safe harbour. It is 30 miles west of Bilbao, and 72 north by west of Burgos. W. Long. 3. 45. N. Lat. 43. 23.

LARES, certain inferior deities among the ancient Romans, who were the guardians of houses; they were also sometimes taken for the guardians of streets and ways, and Tibullus makes them the guardians of the fields. According to Ovid, they were the sons of Mercury and Laura, whose tongue was cut out by Jupiter because she revealed his adulteries to Juno: and not contented with this, he delivered her to Mercury, with orders to conduct her to hell; but this god falling in love with her by the way, had twins by her, who from their mother were called *lares*.

These domestic deities were sometimes represented under the figure of a dog, the symbol of fidelity; because dogs have the same function as the *lares*, which is to guard the house. At other times their images were covered with the skin of a dog, and had the figure of that domestic animal standing by them. The principal sacrifices to the *lares* were incense, fruit, and a hog.

The Romans had a private place in their houses, called *lararium*, in which, among other statues of their gods, were their *lares*, and the images of their ancestors. Tertullian tells us, that the custom of worshipping the *lares* arose from their anciently interring their dead in their houses; whence the credulous people took occasion to imagine, that their souls continued there likewise, and thence proceeded to pay them divine honours. To which may be added, that the custom of burying them in the highways might occasion their being considered likewise as gods of the

highways.

LARINO, a town of Italy, in the kingdom of Naples, in the Capitanata, with a bishop's see. E. Lon. 15. 51. N. Lat. 41. 48.

LARISSA, an ancient, rich, and celebrated town of Greece, in the province of Janna, or Thessaly, with an archbishop's see of the Greek church, a palace, and several handsome mosques. According to Virgil, it is the country of Achilles, and the place where Philip the father of Alexander the Great resided. The inhabitants carry on a considerable trade. The city is agreeably seated on the river Peneus, in E. Long. 23. 36. N. Lat. 38. 51.

LARIX, the LARCH-TREE; a genus of plants by Linnæus classed along with the Pinus; but as Tournefort and all former botanists have separated them on account of the form of their leaves, and they are pretty generally known by these distinctions, we shall adopt the distinction in order to avoid confusion.

*Species.* There are two species, viz. the decidua, with deciduous leaves, and oval obtuse cones; and the cedar of Libanus. The first sort grows naturally upon the Alps and Apennines, and of late has been very much propagated in Britain. It is of quick growth, and the trunk rises to 50 feet or more; the branches are slender, their ends generally hanging downward, and are garnished with long narrow leaves which arise in clusters from one point, spreading open above like the hairs of a painter's brush: they are of a light green, and fall away in autumn. In the month of April the male flowers appear, which are disposed in form of small cones; the female flowers are collected into oval obtuse cones, which in some species have bright purple tops, and in others they are white: these differences are accidental; the cones are about an inch long, obtuse at their points; the scales are smooth, and lie over each other: under each scale there are generally lodged two seeds which have wings. There are other two varieties of this tree, one of which is a native of America and the other of Siberia. The cones of the American kind which have been brought to Britain seem in general to be larger than those of the common sort.

The second sort, or cedar of Libanus, is a tree of antiquity; and what is remarkable, it is not to be found as a native in any other part of the world, as far as hath yet been discovered. What we find mentioned in Scripture of the lofty cedars, can be noways applicable to the common growth of this tree; since, from the experience we have of those now growing in England, as also from the testimony of several travellers who have visited those few remaining trees on mount Libanus, they are not inclined to grow very lofty, but on the contrary extend their branches very far; to which the allusion made by the Psalmist agrees very well, when he is describing the flourishing state of a people, and says, "They shall spread their branches like the cedar-tree."

Rauwolf, in his Travels, says, there were not at that time (i. e. anno 1574) upon mount Libanus more than 25 trees remaining, 24 of which stood in a circle: and the other two, which stood at a small distance, had their branches almost consumed with age; nor could he find any younger tree coming up to succeed them, though he looked about diligently for some.

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Larix.



Larix.

These trees (he says) were growing at the foot of a small hill, on the top of the mountains, and amongst the snow. These having very large branches, commonly bend the tree to one side, but are extended to a great length, and in so delicate and pleasant order, as if they were trimmed and made even with great diligence, by which they are easily distinguished, at a great distance, from fir-trees. The leaves (continues he) are very like to those of the larch-tree, growing close together in little branches upon small brown shoots.

Maundrel, in his Travels, says, there were but 16 large trees remaining when he visited the mountains, some of which were of a prodigious bulk, but that there were many more young ones of a smaller size; he measured one of the largest, and found it to be 12 yards six inches in girth, and yet sound, and 37 yards in the spread of its boughs. At about five or six yards from the ground it was divided into five limbs, each of which was equal to a great tree. What Maundrel hath related was confirmed by a gentleman who was there in the year 1720, with this difference only, viz. in the dimensions of the branches of the largest tree, which he measured, and found to be 22 yards diameter. Now, whether Mr Maundrel meant 37 yards in circumference of the spreading branches, or the diameter of them, cannot be determined by his words; yet either of them well agrees with this last account.

**Culture.** These plants are propagated by sowing in March on a bed of light earth exposed to the morning sun. The seed must be covered half an inch thick with fine light earth, and the beds watered at times when the weather is dry. In about six weeks the plants will appear; they must at this time be carefully guarded from the birds, shaded from the sun and winds, and kept very clear of weeds. In the latter end of April the following year, they may be removed into beds of fresh earth, placing them at ten inches distance every way. They are to be kept here two years, and such of them as seem to bend must be tied up to a stake to keep them upright. They may afterwards be planted in the places where they are to remain. They thrive well on the sides of barren hills, and make a very pretty figure there.

**Uses.** From the larch-tree is extracted what we erroneously call *Venice turpentine*. This substance, or natural balsam, flows at first without incision; when it has done dropping, the poor people who wait in the fir-woods, make incisions at about two or three feet from the ground, into the trunk of the trees, into which they fix narrow troughs about 20 inches long. The end of these troughs is hollowed like a ladle; and in the middle is a small hole bored for the turpentine to run into the receiver which is placed below it. As the gummy substance runs from the trees, it passes along the sloping gutter or trough to the ladle, and from thence runs thro' the holes into the receiver. The people who gather it visit the trees morning and evening from the end of May to September, to collect the turpentine out of the receivers. When it flows out of the tree, Venice turpentine is clear, like water, and of a yellowish white; but, as it grows older, it thickens, and becomes of a citron colour. It is procured in the greatest abundance in the neighbourhood of Lyons,

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and in the valley of St Martin, near St Lucern in Switzerland. For the properties and uses of the cedar of Libanus, see the article CEDAR.

LARK, in ornithology. See ALAUDA.

The lark is not only a very agreeable bird for the cage, but a very hardy one. It will live upon almost any food, so that it have once a-week a fresh tuft of three-leaved grass. The *sky* and *wood-lark* differ in the time of their breeding; the former not producing her young ones till May, the latter hatching them in March. In winter, it is common to see vast flocks of sky-larks; and yet it is observed, that there are fewer of their nests found in the season than of any birds that are common among us. The sky-lark sometimes builds among corn, sometimes among high-grass, and seldom has more than three young ones at a brood, scarce ever more than four; so that the origin of the large flocks we see is the more surprising. The young may be taken out of the nest at a fortnight old, and are so hardy that they will be easily brought up. The best food is sheep's heart chopped with egg; and afterwards oatmeal, bruised hempseed, and bread with a little egg among it. They should have clean sand at the bottom of the cage, but they need no perches.

The common way of taking larks is in the night, with those nets which are called *trammels*. These are usually made of 36 yards in length, and about six yards over, with six ribs of pack-thread, which at the ends are put upon two poles of about 16 feet long, and made lesser at each end. These are to be drawn over the ground by two men, and every five or six steps the net is made to touch the ground, otherwise it will pass over the birds without touching them, and they will escape. When they are felt to fly up against the net, it is clapped down, and then all are safe that are under it. The darkest nights are properest for this sport; and the net will not only take larks, but all other birds that roost on the ground; among which are woodcocks, snipes, partridge, quails, field-fares, and several others. In the depth of winter people sometimes take great numbers of larks by nooses of horse-hair. The method is this: Take 100 or 200 yards of packthread; fasten at every six inches a noose made of double horse-hair; at every 20 yards the line is to be pegged down to the ground, and so left ready to take them. The time to use this is when the ground is covered with snow, and the larks are to be allured to it by some white oats scattered all the way among the nooses. They must be taken away as soon as three or four are hung, otherwise the rest will be frightened; but though the others are scared away just where the sportsman comes, they will be feeding at the other end of the line, and the sport may be thus continued for a long time.

LARRIBUNDAR, a sea-port town of Asia, in Indostan; seated at the mouth of the river Sinda, or Indus, with a harbour capable of receiving ships of 200 tons burden. It is but a small place, consisting of about 100 houses built with wood; but has a stone fort, with five great guns, to prevent robberies; because some of the neighbouring countries are much addicted to thieving. E. Long. 67. o. N. Lat. 25. o.

LARUS, the GULL, in ornithology, a genus belonging to the order of anseres, the characters of which are these: The bill is trait, cultrated, a little crooked at the point, and without teeth; the inferior

mandible is gibbous below the apex; the nostrils are linear, a little broader before, and situated in the middle of the back. There are 11 species, principally distinguished by their colour. The most remarkable species are, 1. The marinus, or black-backed gull. The weight of this species is near five pounds; the length 29 inches; the breadth five feet nine. The bill is very strong and thick, and almost four inches long; the colour a pale yellow; but the lower mandible is marked with a red spot, with a black one in the middle. The head, neck, whole under-side, tail, and lower-part of the back, are white; the upper-part of the back, and wings, are black; the quill-feathers tip with white; the legs of a pale flesh-colour. This kind inhabits our coasts in small numbers, and breeds in the highest cliffs. It feeds not only on fish; but, like the raven, very greedily devours carrion. Its egg is very blunt at each end; of a dusky olive colour, quite black at the greater end, and the rest of it thinly marked with dusky spots. On the coast of Anglesea is found a bird that agrees in all respects with this except in size, in wanting the black spot on the bill, and in the colour of the legs, which in this are of a bright yellow: the extent of wings is only four feet five; the length only 22 inches: the weight one pound and a half. This species, or perhaps variety, rambles far from the sea, and has been shot at Bulstrode, in Middlesex.

2. The cataractes, or skua gull. The length of this singular gull is two feet; the extent four feet and a half; the weight three pounds: the bill two inches one-fourth long, very much hooked at the end, and very sharp: the upper mandible covered more than half-way with a black cere or skin, as in the hawk-kind: the nostrils placed near the bend, and are pervious. The feathers on the head, neck, back, scapulars, and coverts of the wings, are of a deep brown, marked with rust-colour (brightest in the male). The breast, belly, and vent, are ferruginous, tinged with ash-colour. The tail when spread is circular, of a deep brown, white at the root, and with shafts of the same colour. The legs are covered with great black scales: the talons black, strong, and crooked; the interior remarkably so.

This bird inhabits Norway, the Ferroe isles, Shetland, and the noted rock Foula, a little west of them. It is also a native of the South Sea. It is the most formidable gull; its prey being not only fish, but, what is wonderful in a web-footed bird, all the lesser sort of water-fowl, such as teal, &c. Mr Schroter, a surgeon in the Ferroe isles, relates that it likewise preys on ducks, poultry, and even young lambs. It has all the fierceness of the eagle in defending its young; when the inhabitants of those islands visit the nest, it attacks them with great force, so that they hold a knife erect over their heads, on which the skua will transfix itself in its fall on the invaders. The Rev. Mr Low, minister of Birfa in Orkney, confirmed part of the above account: On approaching the quarters of these birds, they attacked him and his company with most violent blows; and intimidated a bold dog of Mr Low's in such a manner, as to drive him for protection to his master. The natives are often very rudely treated by them, while they are attending their sheep on the hills; and are obliged to guard their heads by

holding up their sticks, on which the birds often kill themselves. In Foula it is a privileged bird, because it defends the flocks from the eagle, which it beats and pursues with great fury; so that even that rapacious bird seldom ventures near its quarters. The natives of Foula on this account lay a fine on any person who destroys one: they deny that it ever injures their flocks or poultry; but imagine it preys on the dung of the arctic and other larger gulls, which it persecutes till they moult for fear.

3. The parasiticus, or dung-hunter. These birds are very common in the Hebrides. Numbers of them are found in Jura, Ilay, and Rum, where they breed in the heath; if disturbed, they fly about like the lapwing, but soon alight. They are also found in the Orkneys, where they appear in May, and retire in August. It is also found on the coast of Yorkshire, where it is known by the name of *Faefcr*. All writers who mention it agree, that it has the property of pursuing the lesser gulls so long, that they moult for fear, and that it catches up and devours their excrements before they drop into the water; from which the name. Linnæus wittily calls it the *parasite*, alluding to its sordid life.

The length of this species is 21 inches: the bill is dusky, about an inch and a half long, pretty much hooked at the end, but the trait part is covered with a sort of cere. In the male, the crown of the head is black: the back, wings, and tail, dusky; but the lower part of the inner webs of the quill-feathers white: the hind part of the neck, and whole under-side of the body, white: the tail consists of 12 feathers, the two middlemost near four inches longer than the others; the legs black, small, and scaly. The female is entirely brown, but of a much paler colour below than above; the feathers in the middle of the tail are only two inches longer than the others. Linnæus has separated this from its mate, his *larus parasiticus*, and made it a synonyme to his *larus catarractes*, a bird as different from this as any other of the whole genus.

4. The fuscus, or herring-gull, weighs upwards of 30 ounces; the length 23 inches, its breadth 52; the bill yellow, and the lower mandible marked with an orange-coloured spot: the back, and coverts of the wings, ash-coloured; the upper-part of the five first quill-feathers are black, marked with a white spot near their end; the legs of a pale flesh-colour. These birds breed on the ledges of rocks that hang over the sea; they make a large nest of dead grass, and lay three eggs of a dirty white, spotted with black. The young are ash-coloured, spotted with brown. They do not come to their proper colour the first year: this is common to other gulls; which has greatly multiplied the species, among authors, who are inattentive to these particulars. This gull is a great devourer of fish, especially of that from which it takes its name: it is a constant attendant on the nets, and so bold as to seize its prey before the fishermen's faces.

5. The navius, or wagel. These birds vary much in their size: of those examined by Mr Pennant, one weighed 3 lb. 7 oz. the length was two feet two inches, the breadth five feet six; others again did not weigh two pounds and a half. The irides are dusky; the bill black, and near three inches long. The whole  
plumage

Larus.

plumage of the head and body, above and below, is a mixture of white, ash-colour, and brown: the last colour occupies the middle of each feather; and in some birds is pale, in others dark: the quill-feathers black: the lower-part of the tail is mottled with black and white: the legs are of a dirty white. Some have supposed this to be the young of the preceding species, which (as well as the rest of the gull tribe) scarce ever attains its true colours till after the first year: but it must be observed, that the first colours of the irides, of the quill-feathers, and of the tail, are in all birds permanent; these differ in each of these gulls so greatly, as ever to preserve unerring notes of distinction. This species is likewise called by some the *dung-hunter*, for the same reason as the last is styled so.

6. The winter-gull weighs from 14 to 17 ounces: the length 18 oz. the breadth three feet nine. The irides are hazel: the bill two inches long, but the slenderest of any gull: it is black at the tip, whitish towards the base. The crown of the head, and hind-part and sides of the neck, are white, marked with oblong dusky spots; the forehead, throat, middle of the breast, belly, and rump, are white; the back and scapulars are of a pale grey, the last spotted with brown; the coverts of the wings are of a pale brown, edged with white; the first quill-feather is black, the succeeding are tipped with white: the tail is white, crossed near the end with a black bar; the legs of a dirty bluish white. This kind frequents, during winter, the moist meadows in the inland parts of England, remote from the sea. The gelatinous substance, known by the name of *star-shot*, or *star-gelly*, owes its origin to this bird, or some of the kind; being nothing but the half-digested remains of earth-worms, which these birds feed on, and often discharge from their stomachs.

7. The canus, or common gull, is the most numerous of the genus. It breeds on the ledges of the cliffs that impend over the sea: in winter they are found in vast flocks on all our shores. They differ a little in size. One examined by Mr Pennant weighed 12 ounces and a half: its length was 17 inches, its breadth 36; the bill yellow; the head, neck, tail, and whole under-side of the body, a pure white; the back, and coverts of the wings, a pale grey; near the end of the greater quill-feathers was a black spot; the legs a dull white, tinged with green.

8. The *rissa*, or kittiwake. The length of this species is 14 inches, the extent three feet two. When arrived at full age, the head, neck, belly, and tail, are of a snowy whiteness; behind each ear is sometimes a dusky spot: the back and wings are grey: the exterior edge of the first quill-feather, and tips of the four or five next, are black; the bill yellow, tinged with green; inside of the mouth orange; legs dusky, with only a knob instead of the back-toe. It inhabits the romantic cliffs of Flamborough-head (where it is called *petrel*), the Bass island, the sea rocks near the castle of Slains in the county of Aberdeen, and Prieftholm isle. The young of these birds are a favourite dish in North-Britain, being served up roasted, a little before dinner, in order to provoke the appetite; but, from their rank taste and smell, seem much more likely to produce a contrary effect.

9. The *ridibundus*, pewit, or black-head gull. These

birds breed in vast numbers in the islands of certain pools in the county of Stafford; and, as Dr Fuller tells us, in another on the Essex shores; also in the fens of Lincolnshire. They are birds of passage; resort there in the spring, and after the breeding season disperse to the sea-coasts: they make their nest on the ground, with rushes, dead grass, and the like; and lay three eggs of a dirty olive-colour, marked with black. The young were formerly highly esteemed, and numbers were annually taken and fattened for the table. Plott gives a marvellous account of their attachment to the lord of the soil they inhabit; inasmuch, that, on his death, they never fail to shift their quarters for a certain time. Whitelock, in his annals, mentions a piece of ground near Portsmouth, which produced to the owner 40 l. a-year by the sale of pewits, or this species of gull. These are the *sea-gulls* that in old times were admitted to the noblemen's tables.

The notes of these gulls distinguish them from any others, being like a hoarse laugh. Their weight is about 10 ounces; their length 15 inches, their breadth 37: their irides are of a bright hazel; the edges of the eye-lids of a fine scarlet; and on each, above and below, is a spot of white feathers. Their bills and legs are of a sanguine red; the heads and throats black or dusky; the neck, and all the under-side of the body, and the tail, a pure white; back and wings ash-coloured; tip and exterior edge of the first quill-feather black, the rest of that feather white, the next to that tipped with black, and marked with the same on the inner web.

LARYNX, in anatomy, the upper-part of the wind-pipe. See ANATOMY, n<sup>o</sup> 380. a.

LASCARIS (Andrew John), surnamed *Ryndacenus*, of an ancient Greek family, went into Italy, after the taking of Constantinople by the Turks, in 1453. He was well received by Laurence de Medicis, a distinguished protector of learned men; and was twice sent to Constantinople to collect the best Greek manuscripts, by which means numberless scarce and valuable treasures of literature were carried into Italy. At his return Lewis XII. king of France prevailed on him to settle in the university of Paris, and sent him twice ambassador to Venice. Ten years after, cardinal John de Medicis being elected pope, under the name of Leo X. John Lascaris, his old friend, went to Rome, and had the direction of a Greek college. He died at Rome in 1535, at about the 90th year of his age. He brought into the West most of the fine Greek manuscripts that are now extant, and composed some epigrams in Greek and Latin.

LASCARIS (Constantine), one of the Greeks who were principally concerned in the revival of learning in the West, retired into Italy in 1454, and taught polite literature at Milan, whither he was called by Francis Sforza; he afterwards went to Rome, where he was well received by Cardinal Bessarion. He afterwards taught rhetoric and the Greek tongue at Naples; and ended his days at Messina, leaving the senate of that city many excellent manuscripts which he had brought from Constantinople. He was interred at the public expence, and the senate of Messina erected a marble tomb to his memory. He wrote some grammatical works.

Larynx,  
Lascaris.



Laserpitium  
||  
Latere.

**LASERPITIUM**, **LAZAR-WORT**, a genus of the digynia order, belonging to the pentadria class of plants. There are nine species, none of which are at all remarkable for their beauty, so are only preserved in botanic gardens for the sake of variety. They are natives of Germany, Italy, and the south of France. All of them abound with an acrid juice, which turns to an excessively acrimonious resin. This was used by the ancients to take away black and blue spots that came by bruises or blows, as also to take away excrescences: it was also by some of the ancients used internally; but produced such violent effects, that the more prudent refrained from the use of it. It is generally supposed that the silphium of the ancients was procured from one of the species of this genus; but of this we are at present ignorant.

**LASH**, or **LACE**, in the sea-language, signifies to bind and make fast; as, to lash the bonnet to the course, or the drabber to the bonnets: also the carpenter takes care that the spare yards be lashed fast to the ship's side; and in a rolling sea, the gunners mind that the guns be well lashed, lest they should break loose. **Lashers** are properly those ropes which bind fast the tackles and the breechings of the ordnance, when hauled or made fast within-board.

**LASSITUDE**, or **WEARINESS**, in medicine, a morbid sensation, that comes on spontaneously, without any previous motion, exercise, or labour. This is a frequent symptom in acute distempers: it arises either from an increase of bulk, a diminution of proper evacuation, or too great a consumption of the fluids necessary to maintain the spring of the solids, or from a vitiated secretion of that juice.

**LAST**, in general, signifies the burden or load of a ship. It signifies also a certain measure of fish, corn, wool, leather, &c. A last of codfish, white herrings, meal, and ashes for soap, is twelve barrels; of corn or rapeseed, ten quarters; of gun-powder, twenty-four barrels; of red-herrings, twenty cades; of hides, twelve dozen; of leather, twenty dickers; of pitch and tar, fourteen barrels; of wool, twelve sacks; of stock-fish, one thousand; of flax or feathers, 1700 lb.

**LASTAGE**, or **LESTAGE**, a duty exacted in some fairs and markets, for carrying things bought whither one will. It signifies also the ballast or lading of a ship; and sometimes is used for garbage, rubbish, or such like filth.

**LATERAN COUNCILS**, those councils held in the basilica of the Latin church at Rome. See **COUNCIL**.

There have been five councils held in this place, viz. in the years 1123, 1139, 1179, 1215, and 1513.

**Canon regular of the Congregation of the LATERAN**, were introduced in the reign of Pope Leo I. and continued in the church till the reign of Boniface, who displaced them, and put secular canons in their room; but 150 years after, the regulars were re-instituted again.

**A LATERE**, a term used to denote the qualifications of the cardinals whom the pope sends as legates into foreign countries. They are called *legates a-latere*, as being his holiness's assistants and counsellors in ordinary. There are the most considerable of the other three kinds of legates, being such as the pope commissions to take his place in councils; and so called, in regard that he never gives this office to any but his

favourites and confidants, who are always *a-latere*, at his side. A legate *a-latere* has the power of conferring benefices without a mandate, of legitimating bastards to hold offices, and has a cross carried before him as the ensign of his authority.

**De LATERE**, legates who are not cardinals, but yet are intrusted with an apotolical legation. See the article **LEGATE**.

**LATE-WAKE**, a ceremony used at funerals in the Highlands of Scotland. The evening after the death of any person, the relations and friends of the deceased meet at the house, attended by bagpipe or fiddle: the nearest of kin, be it wife, son, or daughter, opens a melancholy ball, dancing, and *greeting* (i. e. crying violently) at the same time, and this continues till day-light; but with such gambols and frolics among the younger part of the company, that the loss which occasioned them is often more than supplied by the consequences of that night. If the corpse remains unburied for two nights, the same rites are renewed. Thus, Scythian-like, they rejoice at the deliverance of their friends out of this life of misery.

**LATEEN-SAIL**, a long triangular sail extended by a lateen yard, and frequently used by xebecs, poliacres, fettees, and other vessels navigated in the Mediterranean sea.

**LATH**, in building, a long, thin, and narrow slip of wood nailed to the rafters of a roof or ceiling, in order to sustain the covering.

**LATH-Bricks**, a particular sort of bricks made in some parts of England, of 22 inches in length and 6 in breadth, which are used in the place of laths or spars, supported by pillars in calts, for the drying of malt. This is an excellent contrivance; for besides that they are not liable to fire, as the wooden laths are, they retain the heat vastly better; so that being once heated, a very small quantity of fire will serve to keep them so.

**LATHE**, a very useful engine for the turning of wood, ivory, metals, and other materials. See **TURNING**. The invention of the lathe is very ancient: Diodorus Siculus says, the first who used it was a grandson of Dædalus, named Talus. Pliny ascribes it to Theodorus of Samos; and mentions one Thiericles, who rendered himself very famous by his dexterity in managing the lathe. With this instrument the ancients turned all kinds of vases, many whereof they enriched with figures and ornaments in basso relievo. Thus Virgil:

*Lenta quibus torno facili superaddita vitis.*

The Greek and Latin authors make frequent mention of the lathe; and Cicero calls the workmen who used it *vascularii*. It was a proverb among the ancients, to say a thing was formed in the lathe, to express its delicacy and juifness.

The lathe is composed of two wooden cheeks, or sides, parallel to the horizon, having a groove or opening between; perpendicular to these are two other pieces, called *pappets*, made to slide between the cheeks, and to be fixed down at any point at pleasure. These have two points, between which the piece to be turned is sustained; the piece is turned round, backwards and forwards, by means of a string put round it, and fastened above to the end of a pliable pole, and underneath to a trestle or board moved with the

Latere  
||  
Lathe.

*Lathyrus*, the foot. There is also a rest which bears up the tool, and keeps it steady.

As it is the use and application of this instrument that makes the greatest part of the art of turning, we refer the particular description thereof, as well as the manner of applying it in various works, to that head. See **TURNING**.

**LATHYRUS**, *CHICKLING-VETCH*, a genus of the diadelphia order, belonging to the decandria class of plants.

*Species*. 1. The latifolius, or everlasting pea, hath thick, fibrous, perennial roots; climbing, thick, branching annual stalks, having membranaceous wings between the joints, rising upon support by their cirri fix or eight feet high; diphyllous leaves, of two spear-shaped lobes, terminated by claspers; and numerous large red or purple flowers on long foot-stalks, appearing plentifully from June till October, succeeded by abundance of seed. 2. The odorata, or sweet-scented pea, hath a fibrous annual root; a climbing stalk, rising upon support by its claspers three or four feet high; diphyllous leaves of two oval lobes, terminated by climbing tendrils; and flowers by two's on long flower-stalks, of different colours in the varieties. 3. The tangitanus, or Tangier-pea, hath a fibrous annual root, a climbing stalk rising upon support for four or five feet high; diphyllous leaves, of two spear-shaped alternate lobes, terminated by tendrils; and from the joints of the stalk large reddish flowers by two's on long footstalks.

*Culture*. All these species are of hardy growth; and may be propagated by seed in the common ground, in patches where it is designed the plants should flower, for they do not succeed so well by transplantation. They may be sowed in spring; though, if sowed in autumn, the plants will flower earlier the following year.

**LATIMER** (Hugh), bishop of Worcester, was born about the year 1480, at Thurstaston in Leicestershire, the only son of a yeoman of that village. At the age of fourteen he was sent to Christ's college, Cambridge; where he applied himself to the study of divinity, and in proper time took the degree of bachelor in that science. At this time he was a zealous Papist, and was honoured with the office of keeper of the cross to the university: but when he was about thirty years of age, he became a convert to the Protestant religion; and being now one of the twelve licensed preachers from Cambridge, he promulgated his opinions with great freedom. It was not long before he was accused of heresy; and being summoned before cardinal Wolsey, was obliged to subscribe certain articles of faith, which he certainly did not believe. About the year 1529, he was presented by the king to the rectory of Westkinton in Wiltshire; to which place, after residing some time at court with his friend and patron Dr Butts, he retired; but, refusing his former invectives against the Popish doctrines, he was again summoned to answer certain interrogatories, and again obliged to subscribe. In 1535 he was promoted to the bishoprick of Worcester; in the possession of which dignity he continued till the year 1539, when, rather than assent to the act of the six articles, he resigned his mitre, and retired into the country; but was in a short time accused of speaking against the six

articles, and committed to the tower, where he continued prisoner till the death of Henry VIII. which happened in January 1547.

On the accession of Edward VI. Latimer was released, but not restored to his bishoprick, though he preached several times before the king, and continued to exercise his ministerial function with unremitting zeal and resolution. Young Edward, alas! finished his short reign in 1553; and Mary, of infamous memory, ascending the throne, poor Latimer was immediately doomed to destruction, and, together with Cranmer and Ridley, confined in the tower. In April 1554, they were removed to Oxford, that they might dispute with the learned doctors of both universities. Latimer declining the disputation on account of his great age and infirmities, delivered his opinion in writing; and refusing to subscribe the Popish creed, was condemned for heresy; and in October following was, together with bishop Ridley, burnt alive. He behaved with uncommon fortitude on the occasion, and died a real martyr to the Reformation. His general character is that of a learned, virtuous, and brave man.

His works are, 1. Sermons, 1635, fol. 2. Letters; in Fox's Acts and Monum. vol. ii. fol. 1580. 3. An injunction to the prior and convent of St Mary's in Worcestershire. See record at the end of Burnet's History of the Reformation, part. ii. p. 293.

**LATIN**, a dead language, first spoken in Latium, and afterwards at Rome; and still used in the Romish church, and among many of the learned.

This language is principally derived from the Greek, and particularly from the Eolic dialect of that tongue, though it has a great number of words which it borrowed from the languages of the Etruscus, Osci, and other ancient people of Italy; and foreign commerce and wars, in course of time, added a great many more.

The Latin is a strong nervous language, perfectly suitable to the character of the people who spoke it: we have still works of every kind admirably well written in the Latin, though there are vast numbers lost.

The Latin tongue was for a while confined almost wholly within the walls of Rome; nor would the Romans allow the common use of it to their neighbours, or to the nations they subdued: but by degrees they in time became sensible of the necessity of its being generally understood for the convenience of commerce; and accordingly used their endeavours, that all the nations subject to their empire should be united by one common language; so that at length they imposed the use of it by a particular law for that purpose. After the translation of the seat of the empire from Rome to Constantinople, the emperors of the east, being always desirous of retaining the title of Roman emperors, appointed the Latin to be still used; but at length neglecting the empire of the west, they abandoned all care of the Latin tongue, and used the Greek. Charlemagne coming to the empire of the west, revived this language; but at length it gave way, and the French took place of the Latin: it was, however, prodigiously degenerated before it came to be laid aside, in which condition it was found at the time of the Reformation, when Vives, Erasmus, &c. began to open the way for its recovery: since which time the monkish latinity has been

Latin been declining, and all endeavours have been used to retrieve the pure language of the Augustan age. See *LATIN*.  
 Latria. *Latria*.

*LATIN Church.* See *CHURCH*.

*LATINS*, an ancient nation of Italy. See *LA-TIUM*.

*LATINUS*, king of the Latins in Italy; was the son of Faunus; and, it is said, began to reign about the 1216th year before the Christian æra. Lavinia, his only daughter, married Æneas, after that Trojan prince had killed Turnus king of the Rutuli. See *Rome*.

*LATIUM*, (anc. geogr.), the country of the Latins, at first contained within very narrow bounds, but afterwards increased by the accession of various people. The appellation, according to Virgil, is a *latendo*, from Saturn's lying hid there from the hostile pursuits of his son Jupiter; and from *Latium* comes the name *Latini*, the people, (Virgil): though Dionysius Halicarnassensis derives it from king Latinus, who reigned about the time of the Trojan war. But whatever be in this, it is certain, that *Latium*, when under Æneas and his descendants, or the Alban kings, contained only the Latins, exclusive of the Æqui, Volsci, Hernici, and other people; only that Æneas reckoned the Rutuli, after their conquest, among the Latins. And this constituted the ancient *Latium*, confined to the Latins: but afterwards, under the kings, and after their time, it reached from the Tiber to Circeii. Under the consuls, the country of the Æqui, Volsci, Hernici, &c. after long and bloody wars, was added to *Latium*, under the appellation *adjecititious*, or *super-added Latium*, as far as the river Liris, the eastern boundary, and to the north as far as the Marfi and Sabines. The various people, which in succession occupied *Latium*, were the Aborigines, the Pelasgi, the Arcades, the Siculi, the Arunci, the Rutuli; and beyond Circeii, the Volsci, the Osci, the Ausones: but who first, who next, occupied the country, is difficult to say.

*LATISSIMUS*, in anatomy. See *ANATOMY*, *Table of the muscles*.

*LATITUDE*, in astronomy, is the distance of a star north or south from the ecliptic. In geography, it signifies the distance of any place north or south from the equator. See *ASTRONOMY*, n° 209, 214. and *GEOGRAPHY*, n° 11.

*LATITUDINARIAN*, a person of moderation with regard to religious opinions, who believes there is a latitude in the road to heaven, which may admit people of different persuasions,

*LATOMIA*, properly signifies a *quarry*, or place whence stones are dug. The word comes from the Greek *λας*, *stone*, and *τεμας*, *I cut*. These were anciently used as gaols for criminals.—Dionysius had a place of this kind dug in a rock near Syracuse, where an infinite number of people were shut up. Cicero reproaches Verres with imprisoning Roman Citizens in *Latomia*; so that *latomia* became a general name for a prison, and the prisoners inclosed in them were called *latomarii*.

*LATRIA*, in theology, a religious worship due only to God. See *ADORATION*.

The Romanists say, 'They honour God with the worship of *latria*; and the saints with the worship of

*dulia*.' But the terms, however distinct, are usually confounded.

The worship of *latria*, besides its inner characters, has its external marks to distinguish it; the principal whereof is sacrifice, which cannot be offered to any other but God himself, as being a solemn acknowledgement or recognition of the sovereignty of God, and our dependence on him.

Mr Daille seems to own, that some of the fathers of the fourth century allowed the distinction between *latria* and *dulia*.

*LATTEN* denotes iron-plates tinned over, of which tea-canisters are made.

Plates of iron being prepared of a proper thinness, are smoothed by rusting them in an acid liquor, as common water made eager with rye. With this liquor they fill certain troughs, and then put in the plates, which they turn once or twice a-day, that they may be equally rusted over. After this they are taken out, and well scoured with sand; and, to prevent their rusting again, are immediately plunged into pure water, in which they are to be left till the instant they are to be tinned or blanchied; the manner of doing which is this: They flux the tin in a large iron-crucible, which has the figure of an oblong pyramid with four faces, of which two opposite ones are less than the two others. The crucible is heated only from below, its upper part being luted with the furnace all round. The crucible is always deeper than the plates, which are to be tinned, are long; they always put them in downright, and the tin ought to swim over them; to this purpose artificers of different trades prepare plates of different shapes, though Mr Reaumur thinks them all exceptionable. But the Germans use no sort of preparation of the iron to make it receive the tin, more than the keeping it always steeped in water till the time; only, when the tin is melted in the crucible, they cover it with a layer of a sort of suet, which is usually two inches thick, and the plate must pass through this before it can come to the melted tin. The first use of this covering is to keep the tin from burning; for if any part should take fire, the suet would soon moisten it, and reduce it to its primitive state again. The blanchers say, this suet is a compounded matter. It is indeed of a black colour; but Mr Reaumur supposed that to be only an artifice to make it a secret, and that it is only coloured with soot or the smoke of a chimney: but he found it true so far, that the common unprepared suet was not sufficient; for after several attempts, there was always something wanting to render the success of the operation certain. The whole secret of blanching, therefore, was found to lie in the preparation of this suet; and this at length he discovered to consist only in the first frying and burning it. This simple operation not only gives it the colour, but puts it into a condition to give the iron a disposition to be tinned, which it does surprisingly.

The melted tin must also have a certain degree of heat: for if it is not hot enough, it will not stick to the iron; and if it is too hot, it will cover it with too thin a coat, and the plates will have several colours, as red, blue, and purple, and upon the whole will have a cast of yellow. To prevent this, by knowing when the fire has a proper degree of heat, they might try with small pieces of iron; but in general, use teaches them to



Latten,  
Lava.

to know the degree, and they put in the iron when the tin is at a different standard of heat, according as they would give it a thicker or thinner coat. Sometimes also they give the plates a double layer, as they would have them very thickly covered. This they do by dipping them into the tin when very hot the first time, and when less hot the second. The tin which is to give the second coat, must be fresh covered with fuel; and that with the common fuel, not the prepared.

**LATTEN-BRASS**, plates of milled brass, reduced to different thickness, according to the uses it is intended for.

**LAVA**, a stream of melted minerals which runs out of the mouths, or bursts out through the sides, of burning mountains during the time of an eruption. See ICELAND, n° 2, &c. **ÆTNA**, **VESUVIUS**, **VOLCANO**, &c.

The lava, at its first discharge, is in a state of prodigious ignition, greatly superior to anything we can have an idea of from the small artificial furnaces made by us. Sir William Hamilton informs us, that the lava of Vesuvius, at the place from whence it issued (in the year 1767), "had the appearance of a river of red-hot and liquid metal, such as we see in the glass-houses, on which were large floating cinders half lighted, and rolling over one another, with great precipitation, down the side of the mountain, forming on the whole a most beautiful and uncommon cascade." Now, if we consider the materials of which the lava consists, which undoubtedly are the common matters to be found every where in the earth, namely, stones, metallic ores, clay, sand, &c. we shall find that our hottest furnaces would by no means be able to bring them into any degree of fusion; since the materials for glass cannot be melted without a great quantity of very fusible salts, such as alkalies, nitre, &c. mixed along with them. The heat of a volcano must therefore be immense: and besides its heat, it is sometimes attended with a very uncommon circumstance; for Sir William Hamilton informs us, that "the red-hot stones thrown up by Vesuvius on the 31st of March 1766, were perfectly transparent." This we cannot look upon to be the mere effect of heat: for mere heat with us will not make a solid body transparent; and these stones we are sure were not in a state of fusion, or the resistance of the air would have broke them all to pieces, even supposing them, which is very improbable, to have been in that state detached from the rest of the lava. For the transparency, therefore, we must have recourse to electricity, which in some of our experiments hath the property of rendering opaque bodies transparent\*. Indeed it is scarce possible but the lava and every other matter thrown out of a volcano must be in the highest degree electrical; seeing the fire itself most probably takes its rise from electricity, as is shown under the article **VOLCANO**.

The lava, after having once broke out, does not constantly continue running from the same vent, but often hath intermissions, after which it will burst out sometimes at the same place, and sometimes at another. No real flame ever appears to come from the lava. In the day-time its progress is marked by a thick white smoke, from which the light of the red-hot matter being reflected in the night-time, makes it appear

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like flame. But if, during its progress, the lava meets with trees or other combustible substances, which it frequently does, a bright flame immediately issues from its surface, as hath also been remarked by Sir William Hamilton.—This liquid substance, after having run pure for about 100 yards, (more or less, no doubt, according to different circumstances), begins to collect cinders, stones, and a scum is formed on the surface. Our author informs us, that the lava which he observed, with its scum, had the appearance of the river Thames, as he had seen it, after a hard frost and a great fall of snow, when beginning to thaw, carrying down vast masses of snow and ice. In some places it totally disappeared, and ran in a subterraneous passage formed by the scum for several paces; after which it came out pure, having left the scum behind, though a new one was quickly formed. This lava at the farthest extremity from its source did not appear liquid, but like a heap of red-hot coals, forming a wall in some places 10 or 12 feet high, which rolling from the top soon formed another wall, and so on.—While a lava is in this state, Sir William is of opinion, that it is very practicable to divert it into another channel, in a manner somewhat similar to what is practised with rivers. This he was afterwards told had been done with success during the great eruption of **ÆTNA** in 1669: that the lava was directing its course towards the walls of Catania, and advancing very slowly, when they prepared a channel for it round the walls of the town, and turned it into the sea. A succession of men, covered with sheep-skins wetted, were employed to cut through the tough flanks of lava, till they made a passage for that in the centre, which was in perfect fusion, to disgorge itself into the channel prepared for it. It hath been also observed of the lavas of **ÆTNA**, that they do not constantly fall down to the lowest places, but will sometimes ascend in such a manner as to make the valleys lowest places into hills. On this Sir William Hamilton has the following note: "Having heard the same remark with regard to the lavas of Vesuvius, I determined, during an eruption of that volcano, to watch the progress of a current of lava, and I was soon enabled to comprehend this seeming phenomenon; though it is, I fear, very difficult to explain. Certain it is, that the lavas, while in their most fluid state, follow always the laws of other fluids; but, when at a great distance from their source, and consequently encumbered with scorizæ and cinders, the air likewise having rendered their outward coat tough, they will sometimes (as I have seen) be forced up a small ascent, the fresh matter pushing forward that which went before it, and the exterior parts of the lava acting always as conductors (or pipes, if I may be allowed the expression) for the interior parts, that have retained their fluidity from not being exposed to the air."

The composition of the lavas of different volcanoes, and even of different parts of those of the same volcano, is extremely different. Sir William Hamilton is of opinion that this difference in composition contributes not a little to the facility or difficulty with which they afterwards receive earth capable of vegetation. "Some W. Hamilton (says he) have been in a more perfect state of vitrification than others, and are consequently less liable to the impressions of time. I have often observed on

mount

Do not always descend to the lowest places.

Excessive heat of lavas.

\* See Electricity, n° 481.

Probably in a highly electrified state also.

Their general appearance.

LAVA.

mount Vesuvius, when I have been close to a mouth from whence the lava was disgorging itself, that the quality of it varied greatly from time to time. I have seen it as fluid and coherent as glass when in fusion; and I have seen it farinaceous, the particles separating as they forced their way out, just like meal coming from under the grindstones. A stream of lava of this sort being less compact, and containing more earthy particles, would certainly be much sooner fit for vegetation, than one composed of the more perfect vitrified matter."—No person, however, hath yet accurately analysed any lava; neither is it an easy task to do so. Mr Bergman hath indeed made some observations upon the Icelandic lavas, which throw a good deal of light upon this subject. One kind of this lava, he tells us, is very coarse, heavy, and hard, full of bladders, almost black, intermixed with white grains resembling quartz, which in some places have a figure not very unlike a square. This black matter is not attracted by the magnet; but if a piece of it is held against a compass, the needle visibly moves. When tried in the crucible, it yields from 10 to 12 pounds of iron in every hundred weight. It does not dissolve in the least with sal sodæ, and very difficultly with borax, and hardly visible with urinous salt. It seems to contain a great deal of clay in its composition, which may be extracted by all acid solvents. This last he is likewise, from experiments, assured is the case with the lava of Solfaterra in Italy.

The white lava, which possesses more or less of those transparent grains or rays with which lavas are generally chequered, does not seem to be of the nature of quartz, as it cannot be attacked by sal sodæ; it is, however, soluble with some difficulty by borax and fusible urinous salt, or microcosmic acid. These effects are perfectly similar to those produced upon the diamond, ruby, sapphire, topaz, and hyacinth. The chrysolite, garnet, tourmalin, and shirl, can neither be dissolved by sal sodæ, though they are somewhat attacked by it when reduced to a fine powder; and upon the two last-mentioned ones it produces a slight effervescence; on which account, says Mr Bergman, it is possible that the precious stones found upon mount Vesuvius, which are sold at Naples, are nearer related to the real precious stones than is generally imagined. He found no such grains in a finer kind of lava, quite porous within, and entirely burnt out, and considerably lighter than the former ones.

The Iceland agate is of a black or blackish-brown colour, a little transparent at the thin edges like glass, and gives fire with steel. It cannot easily be melted by itself; but becomes white, and flies in pieces. It can hardly be dissolved in the fire by fusible urinous salt; but it succeeds a little better with borax, though with some difficulty. With sal sodæ it dissolves very little; though in the first moments some ebullition is perceived, and the whole mass is afterwards reduced to powder. Hence Mr Bergman concludes, that this agate hath been produced by an excessive fire out of the black lava formerly mentioned.

In the Iceland pumice-stone, quartz and crystals are often found, particularly in the black and reddish-brown kind. The stones thrown out of the volcano, whether grey, or burnt brown, seemed to consist of a hardened clay, mixed with a siliceous earth. They

were sprinkled with rays and grains resembling quartz, and some few flakes of mica. They fused with great difficulty in the fire; with sal sodæ they shewed some effervescence at first, but which ceased in a short time. The parts resembling quartz produced no motion at all; from whence Mr Bergman concludes, that the black lava already mentioned proceeds principally from this mass. Several other stones which were sent him from Iceland, Mr Bergman supposed to have no connection with the eruptions, but to have been produced in some other way.

In Mr Ferber's travels through Italy, we are informed, that he has seen a species of lava so exactly resembling blue iron slags, that it was not to be distinguished from them but with great difficulty. The same author tells us likewise, that "the Vicentine and Veronese lavas and volcanic ashes contain inclosed several sorts of fire-striking and flint-horn stones, of a red, black, white, green, and variegated colour, such as jaspers and agates; that hyacinths, chrysolites, and *pietre obsidiane*, described by Mr Arduini in his *Giornale d'Italia*, are found at Leonedo; and that chalcodony, or opal, pebbles, and noduli with inclosed water-drops, (*chalcodoni opali enhydri*), are dug out of the volcanic cineritious hills near Vicenza. One might consider these flints as being torn and dragged from the scaglia, and thence to have been by floods heaped together with ashes and lavas; because it is a fact, that innumerable quantities of flints, jaspers, and agates, are found in the china and potters clay-hills near *S. Ulderico nel Tretto*, (exactly as similar flints are found in the Saxonian and other china clays.) But how did they come into these volcanic hills, which like those of *St Rocco* near *S. Ulderico*, never contain any clay whatever? Supposing their having been by subterraneous fire separated from veins pre-existing in or near the very bottom of the ancient volcanoes; this explains pretty well how they came into their lava and the china clay, when in an aqueous dissolution or mixture it was vomited, since fragments of quartz-crystallization, marble, and other pre-existing stones, are likewise found in these argillaceous beds, &c.—All these circumstances agree in support of Mr Arduini's assertion, that the beforementioned flint-horn stones found among volcanic materials are owing to subterraneous fire and its meltings. Knowing that by vitrescent compositions and chemical fire even the hardest precious stones can be nearly imitated, why should we deny the same power to nature and its greater subterraneous furnaces?"

On this passage Mr Raspe has the following note. <sup>8</sup> Mr Raspe's criticism on Mr Ferber's  
"To prevent mistakes, and the charge of inaccurate writing or reasoning, the author should have explained himself with more propriety, and with more justice to nature, and perhaps to Mr Arduini. Therefore the translator, who has examined several volcanoes, and studied nature in her own manufactories or offices, endeavours to set him right. His observations are so far agreeing with Messrs Ferber's and Arduini's, that he considers the chalcodony as volcanic productions, but in a quite different sense from that in which the ashes and lavas, with their various inclosed shirl-crystallizations, chrysolite or hyacinth-like vitrifications, and *pietre obsidiane*, are called so. These are undoubtedly immediate productions of the fire, and violent

By Mr Bergman.

By Mr Ferber.

violent melting; the former being but *parafitical fiones* of volcanic matrices; that is to-fay, but *mediate productions* of the fire, as being wifely produced by water, either foaking through and into the holes of volcanic fiones, and depofiting therein the flint-like fire-ftriking fiediment of chalcedony; or, if properly qualified and heated by natural fire or fermentation, precipitating the fame under other circumftances. The former appears to conviction by the Vicentine and Iceland chalcedonies; the latter by a fingular phenomenon, which I fhall take notice of. The Vicentine chalcedonies found in volcanic tufo, contain now and then, inclofed in their middle, drops of the water which produced them; and the Iceland-chalcedonies bear likewife undoubted marks of an aqueous origin. The tranflator knows, by good authority, that they have been difcovered but of late; and ocular infpection has convinced him, not only that thefe Iceland-chalcedonies are equal in grain and colour to the Oriental ones, but remarkably fuperior to them on account of their bignefs. He had large pieces fent him from Copenhagen above a foot fquare; and, what is more to the fubject, inclofed in a brownifh tufo, in which they appeared to have been ftratified, or fucceffively depofited by water; confifting more or lefs of white transparent beds, about an inch thick, and flicking as clofe together as the fimilar ftrata of the coloured agates or onyx. Mr Banks's late voyage to Iceland brings us ftill a ftep further. He examined there the marvelous intermittent fputting hot wells, called the *Geyfers*, at Laugafell, which in the middle of a folatara, or ancient volcano, by their accumulated fiediments have produced or raifed a wide floping hill of white lebes or pot-ftone. I forbear to draw from this fingular phenomenon the many confequences which it offers for natural hiftory; obferving only what is more to the purpofe, that in fome harder pieces of white lebes, kept in Mr Banks's Iceland collection, there appears a ftratified white chalcedony which cannot be confidered as adventitious; and undoubtedly is produced either by a finer fiediment, or by its greater faturatation; proving, that the fubftantial earth of chalcedony and lebes are the fame, and that both are nearly related to the lapis nephriticus, the ferpentine, the bacon-ftone, the amianth, and the talc, which are found in many volcanic places; and, according to Mr Marggraaff's experiments, have been by many mineralogifts wrongly placed among the argillaceous fiones. Similar operations of properly qualified hot wells, fo common and various in volcanic countries, might very well anfwer for the jafpers, agates, and other flints in the china clays and boles. But whether they have in fact produced them, muft be left to future proper inquiries in the volcanic countries where they are fo very common."

<sup>9</sup>  
Bafaltes  
fuppofed to  
be a fpecies  
of lava.

The fame author is alfo of opinion, that the bafaltes itfelf, or thofe pillars of which the Giants Caufeway in Ireland and the ifland of Staffa in the Hebrides confift, is no other than a fpecies of lava, which has taken upon itfelf thefe regular figures during the time of its cooling, as Glauber fays and fome others likewife take upon them a kind of columnar figure during the time of their cryftallization. Of this cryftallization of lavas Mr Ferber tells us he had an inftance in the black kind formerly mentioned. At the time he went from Rome to Oflia, they were paving the road with this fort of

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lava. In fome of the broken pieces he obferved little empty holes of the bignefs of a walnut, incruftated all around their inner fides by white or amethyftine femipellucid, pointed, or truncated pyramidal cryftallizations, entirely refembling the agate nodules or geodes, which commonly are filled with quartz-cryftallizations. There was no crack or fiffure in the ambient compact lava; the cryftal fhells were pretty hard, and might rather be called *quartz*. In the reft of the holes was fome fine brownifh duft, impalpable and light as afhes. In another place alfo, he tells us, that in the greateft part of the Vicentine, Veronefe, and Paduan lavas, is to be found an infinite quantity of white polygonal fhell-cryftallizations, whole figure is as regular, and ftill more polygonal than the bafaltes; and can only be fuppofed to have been formed in the lava while in a fluid ftate. It is indeed very improbable that fuch fubftances fhould be thrown up along with the lava unchanged, feeing the intense heat muft have been fufficient to melt the molt refractory fubftance we can imagine, and we have no evidence of fuch numbers of thefe fubftances exifting at the bottoms of the burning mountains. Still, however, neither Mr Ferber, nor Mr Rafpe, nor any other advocate for the volcanic origin of bafaltes, hath been able to find a bafaltic column either in the lavas of Vefuvius, *Ætna*, or the Iceland volcanoes; fo that this fact muft be in fome meafure dubious, though the analogical reasoning fhould be ever fo ftrong. Mr Rafpe indeed attempts to folve this difficulty by another. "The queftion, (fays he), Why do not all lavas crytallize into prifmatical bafalts, or why do not the Vefuvian lavas fhew that form? is the fame as afking, Why does not every quartz appear in crytallizations?" But the infufficiency of fuch answers is evident.—On the production of bafaltes, &c. from the lava of volcanoes, Mr Bergman gives his opinion in the following words.

"As it is not uncommon, even in the profeflors of Mr Bergman's morality, to pafs from one wrong ftep to another, fo man's opinion are we not without examples of this kind in thofe who make nature their ftudy. Ten years ago it was a general opinion that the furface of the earth, together with the mountains upon it, had been produced by moifture. It is true, fome declared the fire to be the firft original caufe; but the greater number paid little attention to this opinion. Now, on the contrary, that a fubterraneous fire had been the principal agent, gains ground daily: every thing is fuppofed to have been melted, even to the granite. My own opinion with regard to it is this, That both the fire and water have contributed their fhare in this operation, though in fuch a proportion, that the force of the former extends much further than the latter; and, on the contrary, that the fire has only worked in fome parts of the furface of the earth.

"Of all the mountains hitherto known, there are without doubt none more remarkable than thofe that are compofed of angular pillars. A few years ago only one or two of this kind were known; but new ones are daily difcovered; which is a plain proof how much our attention requires being rouzed, to prevent it from flumbering, even on the moft important occafions.

"It cannot much be doubted, that there has been fome connection between thefe pillars and the effects



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of subterranean fire, as they are found in places where the signs of fire are yet visible, and as they are even found mixed with lava, tophus, and other substances produced by fire.

"The cause of the regular form of these pillars is a problem which we have hitherto been unable to solve satisfactorily. This difficulty has appeared so insurmountable to some, that they have thought it impossible for them to be the effects of nature, and have considered them as works made by human hands: this idea betrays the utmost ignorance in regard to the true nature of these mountains of pillars, and does not even deserve a refutation.

"As far as we know, nature makes use of three methods to produce regular forms in the mineral kingdom: 1. That of crystallization, or precipitation; 2. The crusting or setting of the external surface of a liquid mass whilst it is cooling; and, 3. The bursting of a moist substance while it is drying.

"The first method is the most common; but, to all appearance, nature has not made use of this in the present case. Crystals are seldom or never found in any considerable quantity running in the same direction, but either inclining from one another, or, what is still more common, placed towards one another, in sloping directions. They are also generally separated a little from one another when they are regular; the nature of the thing requires this, because the several particles of which the crystals are composed must have the liberty of following that power which affects their regular disposition.

"The basaltic columns, on the contrary, whose height is frequently from 30 to 40 feet, are placed parallel to one another in considerable numbers, and so close together, that the point of a knife can hardly be introduced between them. Besides, in most places, each pillar is divided into several parts or joints, which seem to be placed upon one another: and indeed, it is not uncommon for crystals to be formed above one another in different layers, when the solvent has been visibly diminished at different times; but then the upper crystals never fit so exactly upon the lower ones as to produce connected prisms of the same length and depth as all the strata taken together; but each stratum separately taken, forms its own crystals.

"How then can the Giant's Causeway in the county of Antrim, Fingal's Cave at Staffa, and all other assemblages of pillars of the same kind, be considered as crystallizations! Precipitation, both in the wet and dry manner, requires that the particles should be free enough to fix themselves in a certain order; and as this is not practicable in a large melted mass, no crystallizations appear in it, except on its surface or in its cavities.

"Add to this, that the basalts in a fresh fracture do not shew a plain smooth surface under the microscope; but appear sometimes like grains of different magnitude, and at other times resemble fine rays running in different directions, which does not correspond with the internal structure of the crystals.

"From what I have hitherto mentioned, the opinion that the basalts have been produced by crystallization becomes at least less probable, whether we admit the wet or the dry method. But I must not omit, that the spars exhibit a kind of crystallization,

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which at first sight resembles a heap of basalts; but, upon a closer examination, a very great difference is observed. The form of the spar is every-where alike, but the basalts differ from one another in point of size and number of sides: the former when broken consists of many small unequal cubes, but the basalt does not separate in regular parts, &c. &c.

"Nature's second method to produce regular forms is that of crusting the outer-surface of a melted mass. By a sudden refrigeration, nature, to effect this purpose, makes use of polyhedrous and irregular forms. If we suppose a considerable bed which is become fluid by fire, and spread over a plain, it evidently appears that the surface must first of all lose the degree of heat requisite for melting, and begin to congeal; but the cold requisite for this purpose, likewise contracts the uppermost congealed stratum into a narrower space, and consequently causes it to separate from the remaining liquid mass, as the side exposed to the air is already too stiff to give way. In this manner a stratum is produced running in a parallel direction with the whole mass; others still are produced by the same cause, in proportion as the refrigeration penetrates deeper.

"Hence we may, in my opinion, very plainly see how a bed may be divided into strata. In the same manner the refrigeration advances on the sides, which consequently divides the strata into polyhedrous pillars, which can hardly ever be exactly square, as the strongest refrigeration into the inner-parts of the mass advances almost in a diagonal line from the corners. If we add to this, that a large mass cannot be equal through its composition, nor every-where liquid in the same degree; it will be easy to discover the cause of several irregularities. If the depth of the bed is very considerable in proportion to its breadth, prismatic pillars, without cross divisions, are produced, at least lengthways, from the uppermost surface downwards.

"The third way is perfectly similar to the preceding in respect to the effect; but is different from it by the mass being soaked with water, and by the bursting of it afunder, being the effect of the contraction whilst it is drying. If we suppose such a bed to be spread over a level space, the drying advances in the same manner as the refrigeration in the former case.

"This separation into strata properly happens when a considerable quantity of clay enters into the whole composition, because the clay decreases more than any other kind of earth in drying."

Our author now proceeds to consider the manner in which he thinks the basaltes most probably may be produced; and having rejected the hypothesis of those who derive them from a crystallization of melted lava, he gives his own opinion as follows. "It seems more credible to me, that they have been produced out of their substance whilst it was yet soft, or at least not too hard to be softened by exhalations. If we therefore suppose that a bed is spread over a place where a volcano begins to work, it is evident that a great quantity of the water, always present on these occasions, is driven upwards in exhalations or vapours: these it is well known possess a penetrating softening power, by means of which they also produce  
their

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their first effect; but when they are increased to a sufficient quantity, they force this tough moist substance upwards, which then gradually falls, and during this time bursts in the manner described above.

"My reasons for this opinion are these: First, we do not find the internal grain of the basalts melted or vitrified, which however soon happens by fusion, and for which purpose only a very small degree of fire is requisite. It consequently is very hard to explain, how this substance could have been so fluid, that no traces of bubbles appear in it (at least I have not been able to discover any, after the nicest examination into the Scotch and Icelandic basalts), and yet when broken appear dull and uneven. I know very well, that lava is seldom vitrified within; but the great number of bubbles and pores which are found in the whole mass, are more than sufficient proofs that it has not been perfectly melted to its smallest parts, but has only been brought to be near fluid. Secondly, the basalts so much resemble the finer trapp, both in respect to their grain and original composition, that they can hardly be distinguished in small fragments."

These are the principal arguments on both sides of the question with regard to basaltes, which yet seem far from being decisive on either.

11  
Vast quantities of lava thrown out.

The quantity of matter thrown out from volcanoes under the name of *lava* is prodigious. After the great eruption of *Ætna* in 1669, Borelli went from Pisa to Sicily to observe the effects of it. The matter thrown out at that time amounted to 93,830,750 cubical paces; so that, had it been extended in length upon the surface of the earth, it would have reached more than four times round the whole earth. All this matter, however, was not lava, but consisted also of sand, stone, gravel, &c. The lava he computed at 6,300,000 paces, which formed a river, according to our author, sometimes two miles broad, but according to others it was six or seven miles broad, and sometimes 20 or 30 yards in depth. Sir William Hamilton informs us, that the lavas of *Ætna* are very commonly 15 or 20 miles in length, six or seven in breadth, and 50 feet deep. The most considerable is scarce less than 30 miles long and 15 broad. The most considerable lavas of Vesuvius do not exceed seven miles in length. The same author, however, tells us, that the lava which issued from Vesuvius in 1767, was six miles long, two in breadth, and in most places 60 or 70 feet deep. In one place it had run along a hollow-way made by currents of rain not less than 200 feet deep and 100 wide; and this vast hollow it had in one place filled up. He says, he could not have believed that so great a quantity of matter could have been thrown out in such a short time, if he had not examined the whole course of it himself.

As the lavas are thrown out from the volcanoes in the highest degree of ignition, it may easily be supposed that such vast bodies will retain their heat for a long time. It would indeed be well worth observing, what length of time is required to cool a lava perfectly; as from thence we might in some measure judge how far those philosophers are in the

right, who argue concerning the length of time required to cool an ignited globe of the size of our earth or larger. Sir William Hamilton tells us, that in the month of April 1771, he thrust sticks into some of the crevices of the lava which had issued from Vesuvius in October 1767, and they immediately took fire. On mount *Ætna*, in 1769, he observed the lava that had been disgorged three years before to smoke in many parts. No particular observation, however, hath been made in what proportion the heat of lavas is gradually lost.

Sir William Hamilton informs us of a curious fact relating to a lava in the island called *Lucca*. Here is a cavern shut up with a door; and this cavern is made use of to cool liquors and fruit, which it does in a short time as effectually as ice. Before the door was opened, he felt the cold on his legs very sensibly; but when it was opened, the cold rushed out so as to give him pain; and within the grotto it was intolerable. He was not sensible of wind attending this cold; tho' upon Mount *Ætna* and Vesuvius, where there are caverns of this kind, the cold is evidently occasioned by a subterraneous wind: the natives call such places *ventaroli*. From old lavas there also frequently happens an eruption of noxious vapours called *mosfets*. These likewise break out from wells and subterraneous places in the neighbourhood of a volcano before an eruption. Our author tells us, that the vapour affects the nostrils, throat, and stomach, just as the spirit of hartshorn or any strong volatile salt; and would soon prove fatal if you did not immediately withdraw from it. These *mosfets*, he says, are at all times to be met with under the ancient lavas of Vesuvius, particularly the great eruption of 1631.

As to the nature and quality of lavas, Sir William Hamilton informs us, that those of *Ætna* and Vesuvius are much the same, but those of *Ætna* rather blacker and more porous than those of Vesuvius. Some kinds of lava take a fine polish, and are frequently manufactured into boxes, tables, &c. In Naples, the inhabitants commonly make use of it for paving the streets, and even the subterraneous cities of Pompeii and Herculaneum have been paved with the same substance. A fine large cubic piece of lava is preserved in the hall of the British Museum.

LAVANDULA, LAVENDER, a genus of the gymnospermia order, belonging to the didymia class of plants.

*Species.* 1. The spica, or lavender spike, hath a short shrubby stalk, rising two or three feet high; small spear-shaped entire leaves; and from the ends of the branches, numerous, long, erect, naked spikes of small ringent flowers, of different colours in the varieties. The varieties of this are common narrow-leaved lavender, with blue flowers, and with white flowers—broad-leaved lavender—dwarf lavender: all of them flowering in July. This species is the common lavender; but the narrow-leaved variety, with blue flowers, is the sort commonly cultivated for its flowers for medicine, &c. The *stoechas*, or French lavender, hath a shrubby very branchy stalk, rising two or three feet high; very narrow spear-shaped, pointed, hoary leaves, opposite; and all the branches terminated by short bushy spikes of purple flowers in June and July; succeeded

Lava.  
Lavandula.

13  
Cold and noxious vapours produced by old lavas.

14  
Uses of lava.

12  
Require a long time to cool.

L. *lavandula*|  
Lavatory.

ceded by seeds in August. There is a variety with white flowers. 3. The dentata, or dentate-leaved *stoechas*, hath a woody stalk, branching on every side three or four feet high; leaves deeply indented in a pinnated manner; and the branches terminated by scaly four-cornered spikes of flowers, appearing most part of summer.

*Culture.* All the sorts are propagated plentifully by slips or cuttings of their young shoots in spring. In March or April, take off a quantity of slips or cuttings, from three or four to six inches long; strip off the under leaves; then plant them in a shady border, four inches asunder; give a good watering, repeat it occasionally in dry weather, and the plants will be well-rooted in summer, and each become a good plant fit to be transplanted into any place early in autumn, that is September or October; removing them, if possible, with balls of earth; and if intended to plant them for use, set them in rows two or three feet asunder, and two feet distance in each row: if any are designed for the shrubbery, they should be stationed singly at good distances near the front. Those of the third sort being tender, should be potted to move to shelter in winter. The *lavandula stoechas* is also often raised from seed, sown in March or April, in a bed of light earth.

*Uses.* The two first species are proper both for the kitchen-garden, for medicinal and other family-uses; and to plant in the pleasure-ground to adorn the front of small shrubby compartments, where they will increase the variety very agreeably; and are finely-scented aromatics, both when growing, and their flowers when gathered, especially those of the first species, which are in great esteem for putting among cloaths, and for distilling and other economical uses. The flowers of the first sort are gathered for use in July; which being the time of their perfection, cut off the spikes close in a dry day, and tie them in small bunches for use. These and the summits are in a very eminent degree cephalic and nervine. They are given in paltries, vertigos, lethargies, tremors, and suppression of the menstrual evacuation. The compound spirit distilled from them is famous in these and many other like cases. The distilled oil is particularly celebrated for destroying the *pediculi inguinales*, and other cutaneous insects. If soft spongy paper, dipt in this oil, either alone, or mixed with oil of almonds, be applied at night to the parts infected, the insects will certainly, says Geoffroy, be all found dead in the morning.

*LAVATERA*, in botany, a genus of the polyandria order, belonging to the monodelphia class of plants. There are several species, most of them herbaceous flowery annuals, or shrubby perennials, growing erect from two or three to eight or ten feet high, garnished with large roundish, heart-shaped, and angular leaves, and quinquepetalous flowers of the mallow kind. They are easily propagated by seed in the open ground in the spring; and thrive best when sown where they are designed to remain.

*LAVATORY*, or *LAVADERO*, a name given to certain places in Chili and Peru, where gold is got out of earth by washing.

M. Frezier gives us the following description of the *lavatories* of Chili: "They dig deep into the earth, in such places as they have reason to expect gold in;

and, in order to facilitate this digging, turn a stream of water upon the spot, loosening the earth as much as possible all the time, that the current may have the greater effect, and tear up the earth more strongly. When they are got to the earth they want, they turn off the stream, and dig dry.

"The earth that they now get, is carried on mules, and discharged into a bafon, made somewhat in the manner of a smith's bellows; into which a little rivulet of water runs with a great deal of rapidity, dissolving the parts of the earth, and carrying every thing away with it, excepting the particles of gold, which, by their great weight, precipitate to the bottom of the bafon, and mix with a fine black sand, where they are almost as much hidden as they were before in the earth.

"Sometimes they find very considerable pieces in *lavatories*, particularly pieces of 24 ounces each.—There are several *lavatories*, where they find pepitas, or pieces of virgin gold, of a prodigious size. Among others, they tell of one that weighed 512 ounces, bought by the count de la Moncloa, viceroy of Peru.

"Nine or ten leagues to the east of Coquimbo, are the *lavatories* of Andacoll, the gold whereof is 23 carats fine.—Their work, here, always turns to great profit, excepting when the water fails them.—The natives maintain that the earth is creative, that is, it produces gold continually; because, after having been washed 60 or 80 years, they find it impregnated afresh, and draw almost as much out of it as at first.

*LAUBACH*, a handsome and strong town of Germany, in the circle of Austria, and in Carniola, with a bishop's see, a castle, and very handsome houses. It is seated on a river of the same name, wherein are the largest craw-fish in Europe. E. Long. 14. 45. N. Lat. 46. 20.

*LAUD* (William), archbishop of Canterbury in the 17th century, was born at Reading in 1573, and educated in St John's college, Oxford, of which he was afterwards a fellow and grammar-reader. In 1610, he went into orders. In 1611, he was elected president of St John's college; but his election being disputed, it was confirmed by his majesty. The same year he was sworn the king's chaplain. In 1621, he was nominated bishop of St David's. In 1628, he was translated to the bishopric of London. In 1630, he was elected chancellor of the university of Oxford. In 1633, he attended the king into Scotland, and was sworn a privy-counsellor for that kingdom. During his stay in Scotland, he formed the resolution of bringing that church to an exact conformity with the church of England. In the same year, he succeeded archbishop Abbot in the see of Canterbury; and soon after came out his majesty's declaration about lawful sports on Sundays, which the archbishop was charged with having revived and enlarged, and that with the vexatious prosecutions of such clergymen as refused to read it in their churches.

In 1634-5, the archbishop was put into the great committee of trade and the king's revenue; on the fourth of March following, he was appointed one of the commissioners of the treasury; and on the sixth of March 1635-6, he received the staff of lord high-treasurer

Laubach,  
Land.



I and furer of England.

Laughter.

In order to prevent the printing and publishing what he thought improper books, he procured a decree to be passed in the star-chamber, on the 11th of July 1637, whereby it was enjoined that the master-printers should be reduced to a certain number, and that none of them should print any books till they were licensed either by the archbishop, or the bishop of London, or some of their chaplains, or by the chancellors or vice-chancellors of the two universities.

A new parliament being summoned, met on the 13th of April 1640; and the convocation the day following; but the commons lancing out into complaints against the archbishop, and insisting upon a redress of grievances before they granted any supply, the parliament was dissolved on the 7th of May. The convocation, however, continued sitting; and made 17 canons, which were supposed to be formed under the immediate direction of the archbishop: In the beginning of the long parliament he was attacked on account of those canons: and they being condemned by the house of commons on the 16th of December 1640, "as containing many things contrary to the king's prerogative, to the fundamental laws and statutes of this realm, to the rights of parliament, to the property and liberty of the subject, and tending to sedition, and of dangerous consequence;" he was, on the 18th of December, accused by the commons of high treason, and sent to the Tower. Being tried before the house of lords, for endeavouring to subvert the laws, and to overthrow the Protestant religion, he was found guilty, and beheaded on Tower-hill on January 10th following, in the 72d year of his age.

This learned prelate, notwithstanding his being charged with a design to bring in Popery, wrote an answer to Dr Fisher, which is esteemed one of the best pieces that has been printed against that religion. He was temperate in his diet, and regular in his private life: but his fondness for introducing new ceremonies, in which he shewed a hot and indiscreet zeal, his encouraging of sports on Sundays, his illegal and cruel severity in the star-chamber and high-commission courts, and the fury with which he persecuted the dissenters, and all who presumed to contradict his sentiments, exposed him to popular hatred. Besides his Answer to Fisher, he published several Sermons, and other works.

LAUDANUM. See OPIUM.

LAVENDER. See LAVANDULA.

LAUGHTER, an affection peculiar to mankind, occasioned by something that tickles the fancy.

In laughter, the eye-brows are raised about the middle, and drawn down next the nose; the eyes are almost shut; the mouth opens and shows the teeth, the corners of the mouth being drawn back and raised up; the cheeks seem puffed up, and almost hide the eyes; the face is usually red, the nostrils are open; and the eyes wet. See Plate XCV.

Authors attribute laughter to the fifth pair of nerves, which sending branches to the eye, ear, lips, tongue, palate, and muscles of the cheek, parts of the mouth, præcordia, &c. there hence arises a sympathy, or consent, between all these parts; so that when one of them is acted upon, the others are proportionably af-

fected. Hence a savoury thing seen, or smelt, affects the glands, and parts of the mouth; a thing seen, or heard, that is shameful, affects the cheeks with blushes; on the contrary, if it please and tickle the fancy, it affects the præcordia, and muscles of the mouth and face with laughter; if it cause sadness and melancholy, it likewise affects the præcordia, and demonstrates itself by causing the glands of the eyes to emit tears. Dr Willis accounts for the pleasure of kissing from the same cause; the branches of this fifth pair being spread to the lips, the præcordia, and the genital parts; whence arises a sympathy between those parts.

The affection of the mind by which laughter is produced, is seemingly very different from the other passions with which we are endowed, that it hath engaged the attention of very eminent persons to find it out.—1. Aristotle, in the fifth chapter of his Poetics, observes of comedy, that "it imitates those vices or meannesses only which partake of the ridiculous:—now the ridiculous (says he) consists of some fault or turpitude not attended with great pain, and not destructive." 2. "The passion of laughter, (says Mr Hobbes) is nothing else, but sudden glory arising from some sudden conception of some eminency in ourselves, by comparison with the infirmity of others, or with our own formerly. For men (continues he) laugh at the follies of themselves past, when they come suddenly to remembrance, except when we bring with them any sudden dishonour." 3. Akenfide, in the third book of his excellent poem, treats of ridicule at considerable length. He gives a detail of ridiculous characters; ignorant pretenders to learning, boastful soldiers, and lying travellers, hypocritical churchmen, conceited politicians, old women that talk of their charms and virtue, ragged philosophers who rail at riches, virtuosi intent upon trifles, romantic lovers, wits wantonly satirical, sops that out of vanity appear to be diseased and profligate, dastards who are ashamed or afraid without reason, and fools who are ignorant of what they ought to know. Having finished the detail of characters he makes some general remarks on the cause of ridicule; and explains himself more fully in a prose definition illustrated by examples. The definition, or rather description, is in these words. "That which makes objects ridiculous, is some ground of admiration or esteem connected with other more general circumstances comparatively worthless or deformed: or it is some circumstance of turpitude or deformity connected with what is in general excellent or beautiful; the inconsistent properties existing either in the objects themselves, or in the apprehension of the person to whom they relate; belonging always to the same order or class of being; implying sentiment and design, and exciting no acute or vehement commotion of the heart."—4. Hutcheson has given another account of the ludicrous quality, and seems to think that it is the contrast or opposition of dignity and meanness which occasions laughter.

All these opinions are refuted by Dr Beattie in his Essay on Laughter and Ludicrous Composition, where he has treated the subject in a masterly manner. "To provoke laughter, (says he), is not essential either to wit or humour. For though that unexpected discovery of resemblance between ideas supposed dissimilar, which is called

Laughter. called *Wit*—and that comic exhibition of singular characters, sentiments, and imagery, which is denominated *Humour*,—do frequently raise laughter, they do not raise it always. Addison's poem to Sir Godfrey Kneller, in which the British kings are likened to heathen gods, is exquisitely witty, and yet not laughable. Pope's Essay on Man abounds in serious wit; and examples of serious humour are not uncommon in Fielding's History of Parson Adams, and in Addison's account of Sir Roger de Coverley. Wit, when the subject is grave, and the allusions sublime, raises admiration instead of laughter: and if the comic singularities of a good man appear in circumstances of real distress, the imitation of these singularities in the epic or dramatic comedy will form a species of humour, which, if it should force a smile, will draw forth a tear at the same time. An inquiry, therefore, into the distinguishing characters of wit and humour has no necessary connection with the present subject.

"Some authors have treated of ridicule, without marking the distinction between *ridiculous* and *ludicrous* ideas. But I presume the natural order of proceeding in this inquiry, is to begin with ascertaining the nature of what is *purely ludicrous*. Things *ludicrous* and things *ridiculous* have this in common, that both excite laughter; but the former excite pure laughter, the latter excite laughter mixed with disapprobation and contempt. My design is to analyse and explain that quality in things or ideas, which makes them provoke *pure laughter*, and entitles them to the name of *ludicrous* or *laughable*.

"When certain objects, qualities, or ideas, occur to our senses, memory, or imagination, we smile or laugh at them, and expect that other men should do the same. To smile on certain occasions is not less natural, than to weep at the sight of distress, or cry out when we feel pain.

"There are different kinds of laughter. As a boy, passing by night through a church-yard, sings or whistles in order to conceal his fear even from himself; so there are men, who, by forcing a smile, endeavour sometimes to hide from others, and from themselves too perhaps, their malevolence or envy. Such laughter is unnatural. The sound of it offends the ear; the features distorted by it seem horrible to the eye. A mixture of hypocrisy, malice, and cruel joy, thus displayed on the countenance, is one of the most hateful sights in nature, and transforms the "human face divine" into the visage of a fiend.—Similar to this is the smile of a wicked person pleasing himself with the hope of accomplishing his evil purposes. Milton gives a striking picture of it in that well-known passage:

He ceas'd; for both seem'd highly pleas'd; and Death

Crin'd a horrible & ghastly smile, to hear

His famine should be fill'd, and blest his maw

Destin'd to that good hour.—

But enough of this. Laughter that makes man a fiend or a monster, I have no inclination to analyse. My inquiries are confined to that species of laughter which is at once natural and innocent.

"Of this there are two sorts. The laughter occasioned by tickling or gladness is different from that which arises on reading the Tale of a Tub. The former may be called *animal laughter*: the latter, (if they were lawful to adopt a new word which has become

very common of late) I should term *sentimental*.—Smiles admit of similar divisions. Not to mention the scornful, the envious, the malevolent smile, I would only remark, that of the innocent and agreeable smile there are two sorts. The one proceeds from the risible emotion, and has a tendency to break out into laughter. The other is the effect of good-humour, complacency, and tender affection. This last sort of smile renders a countenance amiable in the highest degree. Homer ascribes it to Venus in an epithet (*φιδωκευς*), which Dryden and Pope, after Waller, improperly translate *laughter-loving*; an idea that accords better with the character of a romp or hoyden, than with the goddess of love and beauty.

"Animal-laughter admits of various degrees; from the gentle impulse excited in a child by moderate joy, to that terrifying and even mortal convulsion which has been known to accompany a change of fortune. This passion may, as well as joy and sorrow, be communicated by sympathy; and I know not whether the entertainment we receive from the playful tricks of kittens and other young animals, may not in part be resolved into something like a fellow-feeling of their vivacity.—Animal and sentimental laughter are frequently blended; but it is easy to distinguish them. The former is often excessive; the latter never, unless heightened by the other. The latter is always pleasing, both in itself and in its cause; the former may be painful in both. But their principal difference is this:—The one always proceeds from a sentiment or emotion excited in the mind, in consequence of certain ideas or objects being presented to it, of which emotion we may be conscious even when we suppress laughter;—the other arises not from any sentiment, or perception of ludicrous ideas, but from some bodily feeling, or sudden impulse on what is called the *animal spirits*, proceeding, or seeming to proceed, from the operation of causes purely material. The present inquiry regards that species that is here distinguished by the name of *sentimental laughter*.

"The pleasing emotion, arising from the view of ludicrous ideas, is known to every one by experience; but, being a simple feeling, admits not of definition. It is to be distinguished from the laughter that generally attends it, as sorrow is to be distinguished from tears; for it is often felt in a high degree by those who are remarkable for gravity of countenance. Swift seldom laughed; notwithstanding his uncommon talents in wit and humour, and the extraordinary delight he seems to have had in surveying the ridiculous side of things. Why this agreeable emotion should be accompanied with laughter as its outward sign, or sorrow express itself by tears, or fear by trembling or paleness, I cannot ultimately explain, otherwise than by saying, that such is the appointment of the Author of nature.—All I mean by this inquiry is, to determine, "What is peculiar to those things which produce laughter;—or rather, which raise in the mind that pleasing sentiment or emotion whereof laughter is the external sign."

"Philosophers have differed in their opinions concerning this matter. In Aristotle's definition quoted above, it is clear that he means to characterise, not laughable qualities in general (as some have thought), but the objects of comic ridicule only; and in this

view the definition is just, however it may have been overlooked or despised by comic writers. Crimes and misfortunes are often in modern plays, and were sometimes in the ancient, held up as objects of public merriment; but if poets had that reverence for nature which they ought to have, they would not shock the common sense of mankind by so absurd a representation.—The definition from Aristotle does not, however, suit the general nature of ludicrous ideas; for it will appear by and by, that men laugh at that in which there is neither fault or turpitude of any kind.

"The theory of Mr Hobbes would hardly have deserved notice, if Addison had not spoken of it with approbation in the 47th paper of the *Spectator*. He justly observes, after quoting the words of Mr Hobbes formerly mentioned, that, "according to this account, when we hear a man laugh excessively, instead of saying that he is very merry, we ought to tell him that he is very proud." It is strange, that the elegant author should be aware of this consequence, and yet admit the theory: for good a judge of human nature could not be ignorant, that laughter is not considered as a sign of pride; persons of singular gravity being often suspected of that vice, but great laughers seldom or never. When we see a man attentive to the innocent humours of a merry company, and yet maintain a fixed solemnity of countenance, is it natural for us to think that he is the humblest, and the only humble person in the circle?

"Another writer in the *Spectator*, n° 249, remarks, in confirmation of this theory, that the *vainest* part of mankind are most addicted to the passion of laughter. Now, how can this be, if the *proudest* part of mankind are also most addicted to it, unless we suppose vanity and pride to be the same thing? But they certainly are different passions. The proud man despises other men, and derives his chief pleasure from the contemplation of his own importance: the vain man stands in need of the applause of others, and cannot be happy without it. Pride is apt to be reserved and sullen; vanity is often affable, and officiously obliging. The proud man is so confident of his merit, and thinks it so obvious to all the world, that he will scarce give himself the trouble to inform you of it: the vain man, to raise your admiration, scruples not to tell you, not only the whole truth, but even a great deal more. In the same person these two passions may, no doubt, be united; but some men are too proud to be vain, and some vain men are too conscious of their own weakness to be proud. Be all this, however, as it will, we have not as yet made any discovery of the cause of laughter: in regard to which, I apprehend, that the vain are not more intemperate than other people; and I am sure that the proud are much less so.

"Hutcheson's account of the origin of laughter is equally unsatisfactory. Granting what he says to be true, I would observe, in the first place, what the ingenious author seems to have been aware of, that there may be a mixture of meanness and dignity where there is nothing ludicrous. A city, considered as a collection of low and lofty houses, is no laughable object. Nor was that person either ludicrous or ridiculous, whom Pope so justly characterises,

"The greatest, wisest, meanest, of mankind."

—But, secondly, cases might be mentioned, of laughter arising from a group of ideas or objects, where there is no discernible opposition of meanness or dignity. We are told of the dagger of Hudibras, that

- "It could scrape trenchers, or chip bread,
- "Toast cheese or bacon, though it were
- "To bait a mouse-trap, 'twould not care;
- "'Twould make clean shoes, or in the earth
- "Set leeks and onions, and so forth."

The humour of the passage cannot arise from the meanness of these offices compared with the dignity of the dagger, nor from any opposition of meanness and dignity in the offices themselves, they being all equally mean; and must therefore be owing to some peculiarity in the description. We laugh, when a droll mimics the solemnity of a grave person; here dignity and meanness are indeed united: but we laugh also, (tho' not so heartily perhaps), when he mimics the peculiarities of a fellow as insignificant as himself, and displays no opposition of dignity and meanness. The levities of Sancho Panca opposed to the solemnity of his master, and compared with his own schemes of preferment, form an entertaining contrast: but some of the vagaries of that renowned squire are truly laughable even when his preferment and his master are out of the question. Men laugh at puns; the wisest and wittiest of our species have laughed at them; queen Elizabeth, Cicero, and Shakespear, laughed at them; clowns and children laugh at them; and most men, at one time or other, are inclined to do the same: but in this sort of low wit, is it an opposition of meanness and dignity that entertains us? Is it not rather a mixture of meanness and diversity,—sameness in the sound, and diversity in the signification?

"In the characters mentioned by Akenfield, the author does not distinguish between what is *laughable* and what is *contemptible*; so that we have no reason to think, that he meant to specify the qualities peculiar to those things which provoke *pure laughter*; and whatever account we may make of his definition, which to those who acquiesce in the foregoing reasonings may perhaps appear not quite satisfactory, there is in the poem a passage that deserves particular notice, as it seems to contain a more exact account of the ludicrous quality, than is to be found in any of the theories abovementioned. This passage we shall soon have occasion to quote."

Our author now goes on to lay down his own theory concerning the origin of laughter, which he supposes to arise from the view of things incongruous united in the same assemblage. "However imperfect (says he) the abovementioned theories may appear, there is none of them destitute of merit; and indeed the most fanciful philosopher seldom frames a theory without consulting nature in some of her more obvious appearances. Laughter very frequently arises from the view of dignity and meanness united in the same object; sometimes, no doubt, from the appearance of assumed inferiority, as well as of small faults and unimportant turpitudes; and sometimes, perhaps, though rarely, from that sort of pride which is described in the passage already quoted from Hobbes.

"All these accounts agree in this, that the cause of laughter.



Laughter. laughter is something compounded; or something that disposes the mind to form a comparison, by passing from one object or idea to another. That this is in fact the case, cannot be proved *a priori*; but this holds in all the examples hitherto given, and will be found to hold in all that are given hereafter. May it not then be laid down as a principle, That laughter arises from the view of two or more objects or ideas disposing the mind to form a comparison? According to the theory of Hobbes, this comparison would be between the ludicrous object and ourselves; according to those writers who misapply Aristotle's definition, it would seem to be formed between the ludicrous object and things or persons in general; and if we incline to Hutcheson's theory, which is the best of the three, we shall think that there is a comparison of the parts of the ludicrous object, first with one another, and secondly with ideas or things extraneous.

"Further: every appearance that is made up of parts, or that leads the mind of the beholder to form a comparison, is not ludicrous. The body of a man or woman, of a horse, a fish, or a bird, is not ludicrous, though it consists of many parts; and it may be compared to many other things without raising laughter: but the picture described in the beginning of the epistle to the *Pisces*, with a man's head, a horse's neck, feathers of different birds, limbs of different beasts, and the tail of a fish, would have been thought ludicrous 1800 years ago, if we believe Horace, and in certain circumstances would no doubt be so at this day. It would seem then, that 'the parts of a laughable assemblage must be in some degree unsuitable and heterogeneous.'

"Moreover: any one of the parts of the Horatian monster, a human head, a horse's neck, the tail of a fish, or the plumage of a fowl, is not ludicrous in itself; nor would those several parts be ludicrous, if attended to in succession, without any view to their union. For to see them disposed on the different shelves of a museum, or even on the same shelf, nobody would laugh, except, perhaps, the thought of uniting them were to occur to his fancy, or the passage of Horace to his memory. It seems to follow, that "the incongruous parts of a laughable idea or object must either be combined so as to form an assemblage, or must be supposed to be so combined."

"May we not then conclude, that "laughter arises from the view of two or more inconsistent, unsuitable, or incongruous parts or circumstances, considered as united in one complex object or assemblage, or as acquiring a sort of mutual relation from the peculiar manner in which the mind takes notice of them." The lines from Akenfide formerly referred to, seem to point at the same doctrine:

Where-e'er the pow'r of ridicule displays  
Her quaint-eye'd visage, *some incongruous form,*  
*Some stubborn dissonance of things combined,*  
Strikes on the quick observer.

And to the same purpose, the learned and ingenious Dr Gerard, in his *Essay on Taste*: 'The sense of ridicule is gratified by an inconsistency and dissonance of circumstances in the same object, or in objects nearly related in the main; or by a similitude or a relation unexpected between things on the whole opposite and

unlike.'

"And therefore, instead of saying, with Hutcheson, that the cause or object of laughter is an 'opposition of dignity and meanness,' I would say, in more general terms, that it is 'an opposition of suitableness or unsuitableness, or of relation and the want of relation, united, or supposed to be united, in the same assemblage.' Thus the offices ascribed to the dagger of Hudibras seem quite heterogeneous; but we discover a bond of connection among them, when we are told that the same weapon could occasionally perform them all. Thus, even in that mimicry which displays no opposition of dignity and meanness, we perceive the actions of one man joined to the features and body of another; that is, a mixture of unsuitableness, or want of relation, arising from the difference of persons, with congruity and similitude, arising from the sameness of the actions. And here let it be observed in general, that the greater number of incongruities that are blended in the same assemblage, the more ludicrous it will probably be. If, as in Butler's resemblance of the morning to a boiled lobster, there is a mixture of dignity and meanness, as well as of likeness and dissimilitude, the effect of the contrast will be more powerful, than if only one of these oppositions had occurred in the ludicrous idea. The sublimity of Don Quixote's mind, contrasted and connected with his miserable equipage, forms a very comical exhibition; but when all this is still further connected and contrasted with Sancho Panca, the ridicule is heightened exceedingly. Had the knight of the lions been better mounted and accoutred, he would not have made us smile so often; because, the hero's mind and circumstances being more adequately matched, the whole group would have united fewer inconsistencies, and reconciled fewer incongruities. Butler has combined a still greater variety of uncouth and jarring circumstances in Ralpho and Hudibras: but the picture, though more elaborate, is less natural. Yet this argues no defect of judgment. His design was, to make his hero not only ludicrous but contemptible; and therefore he jumbles together, in his equipage and person, a number of mean and disgusting qualities, pedantry, ignorance, naiveness, and extreme deformity. But the knight of La Mancha, though a ludicrous, was never intended for a contemptible, personage. He often moves our pity, he never forfeits our esteem; and his adventures and sentiments are generally interesting: which could not have been the case if his story had not been natural, and himself been endowed with great as well as good qualities. To have given him such a shape, and such weapons, arguments, boots, and breeches, as Butler has bestowed on his champion, would have destroyed that solemnity which is so striking a feature in Don Quixote; and Hudibras, with the manners and person of the Spanish hero, would not have been that paltry figure which the English poet meant to hold up to the laughter and contempt of his countrymen. Sir Launcelot Greaves is of Don Quixote's kindred, but a different character. Smollet's design was, not to expose him to ridicule; but rather to recommend him to our pity and admiration. He has therefore given him youth, strength, and beauty, as well as courage and dignity of mind; has mounted him on a generous steed, and arrayed him in an elegant suit

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Laughter of armour. Yet, that the history might have a comic air, he has been careful to contrail and connect Sir Launcelot with a squire and other associates of very dissimilar tempers and circumstances.

"What has been said of the cause of laughter does not amount to an exact description, far less to a logical definition: there being innumerable combinations of congruity and incongruity, of relation and contrariety, of likeness and dissimilitude, which are not ludicrous at all. If we could ascertain the peculiarities of these, we should be able to characterise with more accuracy the general nature of ludicrous combination. But before we proceed to this, it would be proper to evince, that of the present theory thus much at least is true, that though every incongruous combination is not ludicrous, every ludicrous combination is incongruous.

"It is only by a detail of facts or examples that any theory of this sort can be either established or overthrown. By such a detail, the foregoing theories have been, or may be, shewn to be ill-founded, or not sufficiently comprehensive. A single instance of a laughable object, which neither unites, nor is supposed to unite, incongruous ideas, would likewise show the insufficiency of the present; nor will I undertake to prove, (for indeed I cannot), that no such instance can be given. A complete enumeration of ludicrous objects it would be vain to attempt: and therefore we can never hope to ascertain, beyond the possibility of doubt, that common quality which belongs to all ludicrous ideas that are, or have been, or may be imagined. All that can be done in a case of this kind is to prove by a variety of examples, that the theory now proposed is more comprehensive, and better founded, than any of the foregoing." This our author afterwards shews at full length; but as the variety of examples adduced by him would take up too much room to be inserted here, and as every reader must be capable of adducing numberless instances of ludicrous cases to himself, we shall content ourselves with the above explanation of the different theories of laughter, referring those who desire further satisfaction to the treatise already quoted.

*Involuntary LAUGHTER.* See (the *Index*) subjoined to MEDICINE.

*Sardonic LAUGHTER.* *Ibid.*

**LAVINIUM**, (anc. geog.) a town of Latium, six miles to the east of Laurentum, according to an ancient map; so named from *Lavinia*, consort of *Æneas*, and daughter of king *Latinus*; and built by the Trojans. The first town of Roman origin in Latium, and the seat of the *Dii Penates*, (*Livy*;) situated near the river *Numicus*, or *Numicius*; between which and the *Tiber* *Æneas* landed, according to *Virgil*. *Hollatus* supposes the town to have stood on an eminence, now called *il Monte di Levano*.

**LAUNCESTON**, a town of Cornwall in England, seated on the river *Tamar* on the top of a small hill, and is a large corporation sending two members to parliament. It was formerly defended by a castle, which is now in ruins. *W. Long*. 4. 55. *N. Lat.* 50. 40.

**LAUNCH**, in the sea-language, signifies to put out: as, *Launch the ship*, that is, Put her out of dock; *launch aft*, or *forward*, speaking of things that are

stowed in the hold, is, put them more forward; *launch ho!* is a term used when a yard is hoisted high enough, and signifies, *hoist no more*.

**LAURA**, in church-history, a name given to a collection of little cells at some distance from each other, in which the hermits in ancient times lived together in a wilderness.

These hermits did not live in community, but each monk provided for himself in his distinct cell. The most celebrated lauras mentioned in ecclesiastical history were in Palestine; as the laura of *St Euthymus*, at four or five leagues distance from Jerusalem; the laura of *St Saba*, near the brook Cedron; the laura of the Towers, near the river Jordan, &c.

**POET-LAUREATE**, an officer of the household of the kings of Britain, whose business consists only in composing an ode annually on his majesty's birth-day, and on the new-year; sometimes also, though rarely, on occasion of any remarkable victory.—Of the first institution of poets laureate, Mr Wharton has given the following account in his history of English poetry. "Great confusion has entered into this subject, on account of the degrees in grammar, which included rhetoric and versification, anciently taken in our universities, particularly at Oxford: on which occasion, a wreath of laurel was presented to the new graduate, who was afterwards usually styled *Poeta Laureatus*. These scholastic laureations, however, seem to have given rise to the appellation in question. I will give some instances at Oxford, which at the same time will explain the nature of the studies for which our academical philologists received their rewards. About the year 1470, one John Watson, a student in grammar, obtained a concession to be graduated and laureated in that science; on condition that he composed one hundred Latin verses in praise of the university, and a Latin comedy. Another grammarian was distinguished with the same badge, after having stipulated, that, at the next public act, he would affix the same number of hexameters on the great gates of *St Mary's* church, that they might be seen by the whole university. This was at that period the most convenient mode of publication. About the same time, one Maurice Byrchenfaw, a scholar in rhetoric, supplicated to be admitted to read lectures, that is, to take a degree, in that faculty; and his petition was granted, with a provision, that he should write one hundred verses on the glory of the university, and not suffer *Ovid's Art of Love*, and the *Elegies of Pamphilus*, to be studied in auditory. Not long afterwards, one John Bulman, another rhetorician, having complied with the terms imposed, of explaining the first book of *Tully's Offices*, and likewise the first of his *Epistles*, without any pecuniary emolument, was graduated in rhetoric; and a crown of laurel was publicly placed on his head by the hands of the chancellor of the university. About the year 1489, Skelton was laureated at Oxford, and in the year 1493 was permitted to wear his laurel at Cambridge. Robert Whittington affords the last instance of a rhetorical degree at Oxford. He was a secular priest, and eminent for his various treatises in grammar, and for his facility in Latin poetry: having exercised his art many years, and submitting to the customary demand of an hundred verses, he was ho-

Laura,  
Laureate.

Laureate  
||  
Laurentius.

noured with the laurel in the year 1512.

"With regard to the poet-laureate of the kings of England, he is undoubtedly the fame that is styled the *king's versifier*, and to whom 100 shillings were paid as his annual stipend, in the year 1251. But when or how that title commenced, and whether this officer was ever solemnly crowned with laurel at his first investiture, I will not pretend to determine, after the searches of the learned Selden on this question have proved unsuccessful. It seems most probable, that the barbarous and inglorious name of *versifier* gradually gave way to an appellation of more elegance and dignity: or rather, that at length those only were in general invited to this appointment, who had received academical sanction, and had merited a crown of laurel in the universities for their abilities in Latin composition, particularly Latin versification. Thus the *king's laureate* was nothing more than "a graduated rhetorician employed in the service of the king." That he originally wrote in Latin, appears from the ancient title *versificator*: and may be moreover collected from the two Latin poems, which Bafton and Gulielmus, who appear to have refpectively acted in the capacity of royal poets to Richard I. and Edward II. officially composed on Richard's crusade, and Edward's siege of Striveling castle.

"Andrew Bernard, fucceffively poet-laureate of Henry VII. and VIII. affords a still stronger proof that this officer was a Latin scholar. He was a native of Tholoufe, and an Augustine monk. He was not only the king's poet-laureate, as it is supposed, but his hiftoriographer, and preceptor in grammar to Prince Arthur. He obtained many ecclesiastical preferments in England. All the pieces now to be found, which he wrote in the character of poet-laureate, are in Latin. These are, "An *Address* to Henry VIII. for the most auspicious beginning of the 10th year of his reign, with an *Epithalamium* on the marriage of Francis the dauphin of France with the king's daughter;" *A New Year's Gift* for the 1515; and, *Verses* wishing prosperity to his majesty's 13th year. He has left some Latin hymns; and many of his Latin prose pieces, which he wrote in the quality of hiftoriographer to both monarchs, are remaining.

"I am of opinion, that it was not customary for the royal laureate to write in English, till the reformation of religion had begun to diminish the veneration for the Latin language; or rather, till the love of novelty, and a better sense of things, had banished the narrow pedantries of monastic erudition, and taught us to cultivate our native tongue."

LAURENTIALIA, or LAURENTIALIA, called also *Larentinalia*, *Laurentales*, and *Larentales*, feasts celebrated among the Romans on the tenth of the kalends of January, or 23d of December, in memory of Acca Laurentia, wife of the shepherd Faustulus, and nurse of Romulus and Remus.

LAURENTIUS, one of the first printers, and, according to some, the inventor of the art, was born at Harlem about the year 1370, and executed several departments of magistracy of that city. Those writers are mistaken, who assign to him the surname of *Coster*, or assert that the office of *editus* was hereditary in his family. In a diploma of Albert of Bavaria in 1380, in which, among other citizens of Har-

leim, our Laurentius's father is mentioned by the name of *Joannes Laurentii filius*," Beroldus is called *editus*, who was surely of another family; and in 1396 and 1398, Henricus a Lumen enjoyed that office; after whose resignation, Count Albert conferring on the citizens the privilege of electing their *editus*, they, probably soon after, fixed on Laurentius; who was afterwards called *Coster*, from his office, and not from his family-name, as he was defended from an illegitimate branch of the Gens Bröderodia. His office was very lucrative; and that he was a man of great property, the elegance of his house may testify. That he was the inventor of printing, is asserted in the narrative of Junius. His first work was an *Horarium*, containing the Letters of the alphabet, the Lord's prayer, the apostles creed, and two or three short prayers; the next was the *Speculum salutis*, in which he introduced pictures on wooden blocks; then *Donatus*, the larger size; and afterwards the same work in a less size. All these were printed on *separate moveable wooden types* fastened together by threads. If it be thought improbable, that so ingenious a man should have proceeded no farther than the invention of *wooden types*; it may be answered, that he printed for profit, not for fame; and *wooden types* were not only at that time made sooner and cheaper than *metal* could be, but were sufficiently durable for the small impressions of each book he must necessarily have printed.—His press was nearly shaped like the common wine-press.—He printed some copies of *all* his books both on paper and vellum.—It has been very erroneously supposed, that he quitted the profession, and died broken-hearted: but it is certain, that he did not live to see the art brought to perfection.—He died in 1440, aged 70; and was succeeded either by his son-in-law Thomas Peter, who married his only daughter Lucia; or by their immediate descendants, Peter, Andrew, and Thomas; who were old enough (even if their father was dead, as it is likely he was) to conduct the business, the eldest being at least 22 or 23. What books they printed, it is not easy to determine; they having, after the example of Laurentius (more anxious for profit than for fame), neither added to their books their names, the place where they were printed, or the date of the year. Their first essays were new editions of *Donatus* and the *Speculum*. They afterwards re-printed the latter, with a Latin translation; in which they used their grandfather's wooden pictures; and printed the book partly on *wooden blocks*, partly on *wooden separate types*, according to Mr Meerman, who has given an exact engraving of *each sort*, taken from different parts of the same book, which was published between the years 1442 and 1450. Nor did they stop here: they continued to print several editions of the *Speculum*, both in Latin and in Dutch; and many other works, particularly "Historia Alexandri Magni;" "Flavii Vegetii [for Vegetii] Renati Epitome de Re Militari;" and "Opera varia à Thomae Kempis." Of each of these Mr Meerman has given an engraved specimen. They were all printed with *separate wooden types*; and, by their great neatness, are a proof that the descendants of Laurentius were industrious in improving his invention. Kempis was printed at Harlem in 1472, and was the last known work of Laurentius's descendants, who



who soon after disposed of all their materials, and probably quitted the employment; as the use of *suffle types* was about that time universally diffused through Holland, by the settling of Martens at Aloft, where he pursued the art with reputation for upwards of 60 years. See (*History of*) PRINTING.

LAURENTIUM, (anc. geog.), a town of Latium, supposed to be the royal residence of those most ancient kings Latinus, Picus, and Faunus, (Virgil). Hither the emperor Commodus retired, during a pestilence. Its name was from an adjoining grove of bay-trees, midway between Ostia and Antium. Supposed to have stood in the place now called *San Lorenzo*; which seems to be confirmed from the *Via Laurentina* leading to Rome.

LAURO (Philippo), a celebrated painter, born at Rome in 1623. He learned the first rudiments of the art from his father Balthazar, who was himself a good painter. He afterward studied under Angelo Carofello, his brother-in-law; and proved so great a proficient, that in a short time he far surpassed his tutor in design, colouring, and elegance of taste. He applied himself to painting historical subjects in a small size, enriching the backgrounds with lively landscapes, that afforded the eye and the judgment equal entertainment; but though his small paintings are best approved, he finished several grand compositions for altar-pieces that were highly esteemed. He died in 1694; and his works are eagerly bought up at high prices all over Europe.

LAURUS, the BAY-TREE; a genus of the monogynia order, belonging to the cneandria class of plants.

*Species.* 1. The nobilis, or common bay-tree, is a native of Italy, and hath an upright trunk branching on every side from the bottom upward, rising 20 or 30 feet high; spear-shaped, nervous, stiff, evergreen leaves, three inches long and two broad; with small, yellowish, quadrifid, dioecious flowers, succeeded by red berries in autumn and winter. Of this species there are varieties, with broad, narrow, striped, or waved leaves. 2. The æstivalis grows naturally in North America. It rises with an upright stem, branching eight or ten feet high, covered with a purplish bark; oblong, oval, acuminate, veined, deciduous leaves, two or three inches long, and half as broad, growing opposite; with small white flowers succeeded by red berries in those places where it is native, but not in this country. 3. The benzoin, or benjamin tree, is also a native of North America; grows 15 or 20 feet high, divided into a very branchy head; with oval, acute, unveined, deciduous leaves, three or four inches long, and half as broad; and small yellowish flowers, not succeeded by berries in this country. 4. The sassafras is a native of the same country. It hath a shrub-like straight stem, branching 10 or 15 feet high; garnished with both oval and three-lobed, shining, deciduous leaves, of different sizes, from three to six inches long, and near as broad, with small yellowish flowers succeeded by blackish berries, but not in this country. 5. The india, or indian bay-tree, rises with an upright straight trunk, branching regularly 20 or 30 feet high; adorned with very large, spear-shaped, plane, nervous, evergreen leaves on reddish footstalks; and branches of small whitish-green flowers, succeeded

by large oval black berries which do not ripen in this country. 6. The borbonia, or Carolina bay-tree, rises with an upright straight stem, branching 15 or 20 feet high; with large, spear-shaped, evergreen leaves, transversely veined; and long bunches of flowers on red footstalks, succeeded by large blue-berries sitting in red cups. 7. The camphora, or camphor-tree, grows naturally in the woods of the western parts of Japan, and in the adjacent islands. The root smells stronger of camphor than any of the other parts, and yields it in greater plenty. The bark of the stalk is outwardly somewhat rough; but in the inner surface smooth and mucous, and therefore easily separated from the wood, which is dry and of a white colour. The leaves stand upon slender footstalks, have an entire undulated margin, running out into a point; have the upper sur- of a lively and shining green, the lower herbaceous and silky; and are furnished with a few lateral nerves, which stretch archwise to the circumference, and frequently terminate in small warts; a circumstance peculiar to this species of laurel. The flowers are produced on the tops of footstalks, which proceed from the arm-pits of the leaves; but not till the tree has attained considerable age and size. The flower-stalks are slender, branched at the top, and divided into very short pedicles, each supporting a single flower. These flowers are white, and consist of six petals, which are succeeded by a purple and shining berry of the size of a pea, and in figure somewhat top-shaped. It is composed of a soft pulpy substance that is purple, and has the taste of cloves and camphor; and of a nucleus or kernel of the size of a pepper, that is covered with a black, shining, oily cortice, of an insipid taste. 8. The cinnamonom, or cinnamon-tree, is a native of Ceylon. It hath a large root, and divides into several branches, covered with a bark, which on the outer side is of a greyish brown, and on the inside has a reddish cast. The wood of the root is hard, white, and has no smell. The body of the tree, which grows to the height of 40 or 50 feet, is covered, as well as its numerous branches, with a bark which at first is green and afterwards red. The leaf is longer and narrower than the common bay-tree. When first unfolded, it is of a flame colour: but after it has been for some time exposed to the air and grows dry, it changes to a deep green on the upper surface, and to a lighter on the lower. The flowers are small and white, and grow in large bunches at the extremity of the branches: they have an agreeable smell, something like that of the lily of the valley. The fruit is shaped like an acorn, but is not so large.

*Culture.* The common sort is propagated either by seed, layers, or suckers. The seed should be sowed after the berries are ripe, or early in the spring, covering them with earth near an inch deep, or in drills half a foot asunder, the same depth. The plants will come up late in the spring. They must be frequently watered during summer, and in winter screened from the severe frost by means of mats or some other covering; and after having two summers growth in the seed-bed, transplant the strongest of them in the following spring two feet asunder, and a foot apart in each row; giving water in dry weather till they have taken good roots, and hoeing down the weeds in summer. Here they may remain till half a yard or two

Laurus.

or three feet high; and then planted out into the shrubbery in autumn or spring. If the berries are sowed in pots and plunged in a hot-bed in spring, it will bring the plants better forward. The deciduous bay, Benjamin, and sassafras-tree, are propagated in the same manner. The Indian bay, the camphor, and the cinnamon-tree, require the treatment common to green-house plants.

*Uses.* The leaves and berries of the common bay-tree have a moderately strong aromatic smell, and a warm, bitterish, pungent taste: the berries are stronger in both respects than the leaves, and afford in distillation a larger quantity of essential aromatic oil; they yield also an almost insipid oil to the press, in consequence of which they prove unctuous in the mouth. They are warm carminatives, and sometimes exhibited in this intention against flatulent colics, and likewise in hysterical disorders. Their principal use in the present practice is in glysters, and some external applications. The uses of BENZOIN and CAMPHOR have been explained under these articles and the places referred to. The root of the sassafras has a fragrant smell, and a sweetish, aromatic, subacid taste; the bark tastes much stronger than any other part; and the small twigs stronger than the large pieces. It is a warm aperient and corroborant, and frequently employed with good success for purifying and sweetening the blood and juices. For these purposes, infusions made from the rasped root or bark may be drank as tea. In some constitutions indeed, such liquors are, by their fragrance, apt, on first taking them, to affect the head; but in such cases they may be advantageously freed from their flavour by boiling. A decoction of sassafras, boiled down to the consistence of an extract, proves simply bitterish and subastringent. Hoffman assures us, that he has frequently given this extract to the quantity of a scruple at a time, with remarkable success, for strengthening the tone of the viscera in cachexies; as also in the decline of intermittent fevers, and in hypochondriacal spasms. Sassafras yields in distillation an extremely fragrant oil of a penetrating pungent taste, so ponderous (notwithstanding the lightness of the drug itself) as to sink in water. Rectified spirit extracts the whole taste and smell of sassafras; and elevates nothing in evaporation: hence the spirituous extract proves the most elegant and efficacious preparation, as containing the virtue of the root entire.

The cinnamon is the under-bark of the *laurus cinnamomum* above-described. The best season for separating it from the outer-bark, which is grey and rugged, is the spring, when the sap flows in the greatest abundance. It is cut into thin slices, and exposed to the sun, and curls up in drying.—The old trees produce a coarse kind of cinnamon; the spice is in perfection only when the trees are not older than three or four years. When the trunk has been stripped of its bark, it receives no further nourishment; but the root is still alive, and continues to throw out fresh shoots. The fruit of the tree is shaped like an acorn, but is not so large. It contains a seed from whence the tree may be raised, and is commonly ripe in September. When boiled in water, it yields an oil which swims at top, and takes fire. If left to cool, it hardens

into a white substance, of which candles are made which have an agreeable smell, and are reserved for the use of the king of Ceylon. The cinnamon is not reckoned excellent unless it be fine, smooth, brittle, thin, of a yellow colour inclining to red; fragrant, aromatic, and of a poignant, yet agreeable taste. The connoisseurs give the preference to that the pieces of which are long, but slender. That which comes to us is generally mixed with the Cassia bark; but this last is easily distinguished. Cinnamon splinters in breaking, and has a roughness along with its aromatic flavour; while the Cassia breaks over smooth, and has a mucilaginous taste. Cinnamon is a very elegant and useful aromatic, more grateful both to the palate and stomach than most other substances of this class. By its astringent quality it likewise corroborates the viscera, and proves of great service in several kinds of alvine fluxes, and immoderate discharges from the uterus.

LAUSANNE, a large, ancient, and handsome town of Switzerland, capital of the country of Vaud, and in the canton of Bern, with a famous college, and bishop's see. The town-house and the other public buildings are magnificent. It is seated between three hills, near the lake of Geneva, in E. Long. 6. 35. N. Lat. 46. 30.

LAVORI (TERRA DI), a province of Italy, in the kingdom of Naples, bounded on the west by the Campagna of Rome, and by Farther Abruzzo; on the north, by the Citerior Abruzzo, and by the county of Molissa; on the east, by the Ultra Principato; and on the south, by the Principato Citra. It is about 63 miles in length, and 35 in breadth; and is fertile in corn, excellent vines, and other fruits. There are also several mineral springs, and mines of sulphur; Naples is the capital town.

LAW (John), of Edinburgh, the famous projector, who raised himself to the dignity of comptroller-general of the finances of France, upon the strength of a scheme for establishing a bank, an East-India and a Mississippi company, with the profits of which, the national debt of France was to be paid off. He first offered his plan to Victor Amadeus, king of Sardinia; who told him, "he was not powerful enough to ruin himself." The French ministry accepted it in 1710. In 1716 he opened a bank in his own name, under the protection of the duke of Orleans, regent of France: most of the people of property of every rank in France, seduced by the prospect of immense gains, subscribed for shares in the bank and the companies. In 1718, Law's was declared a royal bank, and the shares rose to more than 20 times the original value; so that, in 1719, they were worth more than 80 times the amount of all the current specie in the kingdom. But the following year, this great fabric of false credit fell to the ground, and almost overthrew the French government, ruining some thousands of families; and it is remarkable, that the same desperate game was played by the South-sea directors in England, in the same fatal year, 1720. Law being exiled as soon as the credit of his projects began to fail, retired to Venice, where he died in 1729.

Lauffann

Law.

## L A W.

## PART I. OF THE NATURE OF LAWS IN GENERAL.

<sup>1</sup> Definition; general, and  
 LAW, in its most general and comprehensive sense, signifies a rule of action; and is applied indiscriminately to all kinds of action, whether animate or inanimate, rational or irrational. Thus we say, the laws of motion, of gravitation, of optics, or mechanics, as well as the laws of nature and of nations. And it is that rule of action, which is prescribed by some superior, and which the inferior is bound to obey.

Thus when the Supreme Being formed the universe, and created matter out of nothing, he impressed certain principles upon that matter, from which it can never depart, and without which it would cease to be. When he put that matter into motion, he established certain laws of motion, to which all moveable bodies must conform. And, to defend from the greatest operations to the smallest, when a workman forms a clock, or other piece of mechanism, he establishes at his own pleasure certain arbitrary laws for its direction; as, that the hand shall describe a given space in a given time; to which law as long as the work conforms, so long it continues in perfection, and answers the end of its formation.

If we farther advance, from mere inactive matter to vegetable and animal life, we shall find them still governed by laws; more numerous indeed, but equally fixed and invariable. The whole progress of plants, from the seed to the root, and from thence to the seed again; the method of animal nutrition, digestion, secretion, and all other branches of vital economy;—are not left to chance, or the will of the creature itself, but are performed in a wondrous involuntary manner, and guided by unerring rules laid down by the great Creator.

This then is the general signification of law, a rule of action dictated by some superior being; and, in those creatures that have neither the power to think, nor to will, such laws must be invariably obeyed, so long as the creature itself subsists, for its existence depends on that obedience. But laws, in their more confined sense, and in which it is our present business to consider them, denote the rules, not of action in general, but of *human* action or conduct: that is, the precepts by which man, the noblest of all sublunary beings, a creature endowed with both reason and free-will, is commanded to make use of those faculties in the general regulation of his behaviour.

Man, considered as a creature, must necessarily be subject to the laws of his Creator, for he is entirely a dependent being. A being, independent of any other, has no rule to pursue, but such as he prescribes to himself: but a state of dependence will inevitably oblige the inferior to take the will of him on whom he depends, as the rule of his conduct; not indeed in every particular, but in all those points wherein his dependence consists. This principle therefore has more or less extent and effect, in proportion as the superiority of the one and the dependence of the other is greater or less, absolute or limited. And consequently, as man depends absolutely upon his Maker for every thing,

it is necessary that he should in all points conform to his Maker's will.

This will of his Maker is called the *law of nature*.<sup>3</sup> For as God, when he created matter, and endued it with a principle of mobility, established certain rules for the perpetual direction of that motion; so, when he created man, and endued him with free-will to conduct himself in all parts of life, he laid down certain immutable laws of human nature, whereby that free-will is in some degree regulated and restrained, and gave him also the faculty of reason to discover the purport of those laws.

Considering the Creator only as a being of infinite power, he was able unquestionably to have prescribed whatever laws he pleased to his creature, man, however unjust or severe. But as he is also a Being of infinite wisdom, he has laid down only such laws as were founded in those relations of justice that existed in the nature of things antecedent to any positive precept. These are the eternal, immutable laws of good and evil, to which the Creator himself in all his dispensations conforms; and which he has enabled human reason to discover, so far as they are necessary for the conduct of human actions. Such, among others, are these principles: That we should live honestly, should hurt nobody, and should render to every one his due; to which three general precepts Justinian has reduced the whole doctrine of law.

But if the discovery of these first principles of the law of nature depended only upon the due exertion of right reason, and could not otherwise be obtained than by a chain of metaphysical disquisitions, mankind would have wanted some inducement to have quickened their inquiries, and the greater part of the world would have rested content in mental idleness, and ignorance its inseparable companion. As therefore the Creator is a being, not only of infinite power and wisdom, but also of infinite goodness, he has been pleased so to contrive the constitution and frame of humanity, that we should want no other prompter to inquire after and pursue the rule of right, but only our own self-love, that universal principle of action. For he has so intimately connected, so inseparably interwoven, the laws of eternal justice with the happiness of each individual, that the latter cannot be attained but by observing the former; and, if the former be punctually obeyed, it cannot but induce the latter. In consequence of which mutual connection of justice and human felicity, he has not perplexed the law of nature with a multitude of abstracted rules and precepts, referring merely to the fitness or unfitness of things, as some have vainly surmised; but has graciously reduced the rule of obedience to this one paternal precept, "that man should pursue his own happiness." This is the foundation of what we call *ethics*, or *natural law* \*. For the several articles, into which it is branched in our systems, amount to no more than demonstrating, that this or that action tends to man's real happiness; and therefore very justly concluding, that the performance of it is a part

Law of nature.

\* See Morality.



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of the law of nature; or, on the other hand, that this or that action is destructive of man's real happiness, and therefore that the law of nature forbids it.

This law of nature, being coeval with mankind, and dictated by God himself, is of course superior in obligation to any other. It is binding over all the globe, in all countries, and at all times: no human laws are of any validity, if contrary to this; and such of them as are valid derive all their force, and all their authority, mediately or immediately, from this original.

But in order to apply this to the particular exigencies of each individual, it is still necessary to have recourse to reason: whose office it is to discover, as was before observed, what the law of nature directs in every circumstance of life; by considering, what method will tend the most effectually to our own substantial happiness. And if our reason were always, as in our first ancestor before his transgression, clear and perfect, unruddied by passions, unclouded by prejudice, unimpaired by disease or intemperance, the task would be pleasant and easy; we should need no other guide but this. But every man now finds the contrary in his own experience; that his reason is corrupt, and his understanding full of ignorance and error.

This has given manifold occasion for the benign interposition of Divine Providence; which, in compassion to the frailty, the imperfection, and the blindness of human reason, hath been pleased, at sundry times and in divers manners, to discover and enforce its laws by an immediate and direct revelation. The doctrines thus delivered, we call the *revealed or divine law*, and they are to be found only in the Holy Scriptures. These precepts, when revealed, are found upon comparison to be really a part of the original law of nature, as they tend in all their consequences to man's felicity. But we are not from thence to conclude, that the knowledge of these truths was attainable by reason, in its present corrupted state; since we find, that, until they were revealed, they were hid from the wisdom of ages. As then the moral precepts of this law are indeed of the same original with those of the law of nature, so their intrinsic obligation is of equal strength and perpetuity. Yet undoubtedly the revealed law is of infinitely more authenticity than that moral system which is framed by ethical writers, and denominated the *natural law*: because one is the law of nature, expressly declared so to be by God himself; the other is only what, by the assistance of human reason, we imagine to be that law. If we could be as certain of the latter as we are of the former, both would have an equal authority: but, till then, they can never be put in any competition together.

Upon these two foundations, the law of nature and the law of revelation, depend all human laws; that is to say, no human laws should be suffered to contradict these. There are, it is true, a great number of indifferent points, in which both the divine law and the natural leave a man at his own liberty; but which are found necessary, for the benefit of society, to be restrained within certain limits. And herein it is that human laws have their greatest force and efficacy: for, with regard to such points as are not indifferent, human laws are only declaratory of, and act in subordination to, the former. To instance in the case of murder: this is expressly forbidden by the divine, and demonstrably

by the natural law; and from these prohibitions arises the true unlawfulness of this crime. Those human laws, that annex a punishment to it, do not at all increase its moral guilt, or superadd any fresh obligation in *foro conscientie* to abstain from its perpetration. Nay, if any human law should allow or enjoin us to commit it, we are bound to transgress that human law, or else we must offend both the natural and the divine. But with regard to matters that are in themselves indifferent, and are not commanded or forbidden by those superior laws; such, for instance, as exporting of wool into foreign countries; here the inferior legislature has scope and opportunity to interpose, and to make that action unlawful which before was not so.

If man were to live in a state of nature, unconnected with other individuals, there would be no occasion for any other laws than the law of nature and the law of God. Neither could any other law possibly exist: for a law always supposes some superior who is to make it; and in a state of nature we are all equal, without any other superior but him who is the Author of our being. But man was formed for society; and, as is demonstrated by the writers on this subject, is neither capable of living alone, nor indeed has the courage to do it. However, as it is impossible for the whole race of mankind to be united in one great society, they must necessarily divide into many; and form separate states, commonwealths, and nations, entirely independent of each other, and yet liable to a mutual intercourse. Hence arises a third kind of law to regulate this mutual intercourse, called the *law of nations*: which, as none of these states will acknowledge a superiority in the other, cannot be dictated by either; but depends entirely upon the rules of natural law, or upon mutual compacts, treaties, leagues, and agreements, between these several communities: in the construction also of which compacts we have no other rule to resort to, but the law of nature; being the only one to which both communities are equally subject: and therefore the civil law very justly observes, that *quod naturalis ratio inter omnes homines constituit, vocatur jus gentium*.

To the consideration, then, of the law of nature, the revealed law, and the law of nations, succeeds that of the municipal or civil law; that is, the rule by which particular districts, communities, or nations are governed; being thus defined by Justinian, "*jus civile est quod quisque sibi populus constituit*." We call it *municipal law*, in compliance with common speech; for though, strictly, that expression denotes the particular customs of one single *municipium* or free town, yet it may with sufficient propriety be applied to any one state or nation which is governed by the same laws and customs.

Municipal law, thus understood, is properly defined to be "a rule of civil conduct prescribed by the supreme power in a state, commanding what is right and prohibiting what is wrong." Let us endeavour to explain its several properties, as they arise out of this definition.

And, first, it is a *rule*: not a transient sudden order from a superior to or concerning a particular person; but something permanent, uniform, and universal. Therefore a particular act of the legislature to confiscate the goods of Titius, or to attain him of high treason, does not enter into the idea of a municipal law:

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for the operation of this act is spent upon Titius only, and has no relation to the community in general; it is rather a sentence, than a law. But an act to declare that the crime of which Titius is accused shall be deemed high treason; this has permanency, uniformity, and universality, and therefore is properly a rule. It is also called a *rule*, to distinguish it from *advice* or *counsel*, which we are at liberty to follow or not as we see proper, and to judge upon the reasonableness or unreasonableness of the thing advised: whereas our obedience to the law depends not upon our *approbation*, but upon the *Maker's will*. Counsel is only matter of persuasion, law is matter of injunction; counsel acts only upon the willing, law upon the unwilling also.

It is also called a *rule*, to distinguish it from a *compact* or *agreement*; for a compact is a promise proceeding from us, law is a command directed to us. The language of a compact is, "I will, or will not, do this;" that of a law is, "Thou shalt, or shalt not, do it." It is true there is an obligation which a compact carries with it, equal in point of conscience to that of a law; but then the original of the obligation is different. In compacts, we ourselves determine and promise what shall be done, before we are obliged to do it; in laws, we are obliged to act without ourselves determining or promising any thing at all. Upon these accounts law is defined to be "a rule."

Municipal law is also "a rule of civil conduct." This distinguishes municipal law from the natural, or revealed: the former of which is the rule of moral conduct; and the latter not only the rule of moral conduct, but also of faith. These regard man as a creature; and point out his duty to God, to himself, and to his neighbour, considered in the light of an individual. But municipal or civil law regards him also as a citizen, and bound to other duties towards his neighbour, than those of mere nature and religion: duties, which he has engaged in by enjoying the benefits of the common union; and which amount to no more, than that he do contribute, on his part, to the subsistence and peace of the society.

It is likewise "a rule prescribed." Because a bare resolution, confined in the breast of the legislator, without manifesting itself by some external sign, can never be properly a law. It is requisite that this resolution be notified to the people who are to obey it. But the manner in which this notification is to be made, is matter of very great indifference. It may be notified by universal tradition and long practice, which supposes a previous publication, and is the case of the common law of England and of Scotland. It may be notified *viva voce*, by officers appointed for that purpose; as is done with regard to proclamations, and such acts of parliament as are appointed to be publicly read in churches and other assemblies. It may, lastly, be notified by writing, printing, or the like; which is the general course taken with all our acts of parliament. Yet, whatever way is made use of, it is incumbent on the promulgators to do it in the most public and perspicuous manner; not like Caligula, who (according to Dio Cassius) wrote his laws in a very small character, and hung them up upon high pillars, the more effectually to ensnare the people. There is still a more unreasonable method than this, which is called making of laws *ex post facto*; when after an action (indifferent in itself) is committed,

the legislator then for the first time declares it to have been a crime, and inflicts a punishment upon the person who has committed it. Here it is impossible that the party could foresee, that an action, innocent when it was done, should be afterwards converted to guilt by a subsequent law: he had therefore no cause to abstain from it; and all punishment for not abstaining must of consequence be cruel and unjust. All laws should be therefore made to commence in *future*, and be notified before their commencement; which is implied in the term "prescribed." But when this rule is in the usual manner notified, or prescribed, it is then the subject's business to be thoroughly acquainted therewith; for if ignorance, of what he might know, were admitted as a legitimate excuse, the laws would be of no effect, but might always be eluded with impunity.

But further: Municipal law is "a rule of civil conduct prescribed by the supreme power in a state." For <sup>Fourth</sup> <sup>property.</sup> legislature, as was before observed, is the greatest act of superiority that can be exercised by one being over another. Wherefore it is requisite to the very essence of a law, that it be made by the supreme power. Sovereignty and legislature are indeed convertible terms; one cannot subsist without the other.

This will naturally lead us into a short inquiry concerning the nature of society and civil government; and the natural inherent right that belongs to the sovereignty of a state, wherever that sovereignty be lodged, of making and enforcing laws.

The only true and natural foundations of society are the wants and fears of individuals. Not that we can believe, with some theoretical writers, that there ever was a time when there was no such thing as society; and that, from the impulse of reason, and through a sense of their wants and weaknesses, individuals met together in a large plain, entered into an original contract, and chose the tallest man present to be their governor. This notion, of an actually existing unconnected state of nature, is too wild to be seriously admitted: and besides, it is plainly contradictory to the revealed accounts of the primitive origin of mankind, and their preservation 2000 years afterwards; both which were effected by the means of single families. These formed the first society, among themselves; which every day extended its limits; and when it grew too large to subsist with convenience in that pastoral state wherein the patriarchs appear to have lived, it necessarily subdivided itself by various migrations into more. Afterwards, as agriculture increased, which employs and can maintain a much greater number of hands, migrations became less frequent: and various tribes, which had formerly separated, reunited again; sometimes by compulsion and conquest, sometimes by accident, and sometimes perhaps by compact. But though society had not its formal beginning from any convention of individuals, actuated by their wants and their fears; yet it is the sense of their weakness and imperfection that keeps mankind together; that demonstrates the necessity of this union; and that therefore is the solid and natural foundation, as well as the cement, of society. And this is what we mean by the original contract of society; which, though perhaps in no instance it has ever been formally expressed at the first institution of a state, yet in nature and reason must always be understood and implied in the very act of associating

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together: namely, that the whole should protect all its parts, and that every part should pay obedience to the will of the whole; or, in other words, that the community should guard the rights of each individual member, and that (in return for this protection) each individual should submit to the laws of the community; without which submission of all, it was impossible that protection could be certainly extended to any.

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Govern-  
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For when society is once formed, government results of course, as necessary to preserve and to keep that society in order. Unless some superior be constituted, whose commands and decisions all the members are bound to obey, they would still remain as in a state of nature, without any judge upon earth to define their several rights, and redress their several wrongs. But, as all the members of society are naturally equal, it may be asked, In whose hands are the reins of government to be entrusted? To this the general answer is easy; but the application of it to particular cases has occasioned one half of those mischiefs which are apt to proceed from misguided political zeal. In general, all mankind will agree, that government should be reposed in such persons, in whom those qualities are most likely to be found, the perfection of which is among the attributes of him who is emphatically styled the *Supreme Being*; the three grand requisites, namely, of wisdom, of goodness, and of power: wisdom, to discern the real interest of the community; goodness, to endeavour always to pursue that real interest; and strength, or power, to carry this knowledge and intention into action. These are the natural foundations of sovereignty, and these are the requisites that ought to be found in every well constituted frame of government.

How the several forms of government we now see in the world at first actually began, is matter of great uncertainty, and has occasioned infinite disputes. It is not our business or intention to enter into any of them. However they began, or by what right soever they subsist, there is and must be in all of them a supreme, irresistible, absolute, uncontrolled authority, in which the *jura summi imperii*, or the rights of sovereignty, reside. And this authority is placed in those hands, wherein (according to the opinion of the founders of such respective states, either expressly given, or collected from their tacit approbation) the qualities requisite for supremacy, wisdom, goodness and power, are the most likely to be found.

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The political writers of antiquity will not allow more than three regular forms of government: the first, when the sovereign power is lodged in an aggregate assembly consisting of all the members of a community, which is called a *democracy*; the second, when it is lodged in a council composed of select members, and then it is styled an *aristocracy*; the last, when it is entrusted in the hands of a single person, and then it takes the name of a *monarchy*. All other species of government, they say, are either corruptions of, or reducible to, these three.

By the sovereign power, as was before observed, is meant the making of laws; for wherever that power resides, all others must conform to and be directed by it, whatever appearance the outward form and administration of the government may put on. For it is at any time in the option of the legislature to alter that form and administration by a new edict or rule, and to

put the execution of the laws into whatever hands it pleases: and all the other powers of the state must obey the legislative power in the execution of their several functions, or else the constitution is at an end.

In a democracy, where the right of making laws resides in the people at large, public virtue, or goodness of intention, is more likely to be found, than either of the other qualities of government. Popular assemblies are frequently foolish in their contrivance, and weak in their execution; but generally mean to do the thing that is right and just, and have always a degree of patriotism or public spirit. In aristocracies there is more wisdom to be found than in the other forms of government; being composed, or intended to be composed, of the most experienced citizens: but there is less honesty than in a republic, and less strength than in a monarchy. A monarchy is indeed the most powerful of any, all the sinews of government being knit and united together in the hand of the prince; but then there is imminent danger of his employing that strength to improvident or oppressive purposes.

Thus these three species of government have, all of them, their several perfections and imperfections. Democracies are usually the best calculated to direct the end of a law; aristocracies, to invent the means by which that end shall be obtained; and monarchies, to carry those means into execution. And the ancients, as was observed, had in general no idea of any other permanent form of government but these three: for though Cicero declares himself of opinion, "*esse optime constitutam rempublicam, quæ ex tribus generibus illis, regali, optimo, et populari, sit modice confusa*," yet Tacitus treats this notion of a mixed government, formed out of them all, and partaking of the advantages of each, as a visionary whim, and one that, if effected, could never be lasting or secure.

But, happily for us of this island, the British constitution has long remained, and we trust will long continue, a standing exception to the truth of this observation. For, as with us the executive power of the laws is lodged in a single person, they have all the advantages of strength and dispatch that are to be found in the most absolute monarchy: and, as the legislature of the kingdom is entrusted to three distinct powers, entirely independent of each other; first, the king; secondly, the lords spiritual and temporal, which is an aristocratical assembly of persons selected for their piety, their birth, their wisdom, their valour, or their property; and, thirdly, the house of commons, freely chosen by the people from among themselves, which makes it a kind of democracy; as this aggregate body, actuated by different springs and attentive to different interests, composes the British parliament, and has the supreme disposal of every thing, there can no inconvenience be attempted by either of the three branches, but will be withstood by one of the other two, each branch being armed with a negative power sufficient to repel any innovation which it shall think inexpedient or dangerous.

Here, then, is lodged the sovereignty of the British constitution; and lodged as beneficially as is possible for society. For in no other shape could we be so certain of finding the three great qualities of government so well and so happily united. If the supreme power were lodged in any one of the three branches separately,

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rately, we must be exposed to the inconveniences of either absolute monarchy, aristocracy, or democracy; and so want two of the three principal ingredients of good polity, either virtue, wisdom, or power. If it were lodged in any two of the branches; for instance, in the king and house of lords; our laws might be providently made and well executed, but they might not always have the good of the people in view: if lodged in the king and commons, we should want that circumspection and mediatory caution, which the wisdom of the peers is to afford: if the supreme rights of legislature were lodged in the two houses only, and the king had no negative upon their proceedings, they might be tempted to encroach upon the royal prerogative, or perhaps to abolish the kingly office, and thereby weaken (if not totally destroy) the strength of the executive power. But the constitutional government of this island is so admirably tempered and compounded, that nothing can endanger or hurt it, but destroying the equilibrium of power between one branch of the legislature and the rest. For if ever it should happen, that the independence of any one of the three should be lost, or that it should become subservient to the views of either of the other two, there would soon be an end of our constitution. The legislature would be changed from that which was originally set up by the general consent and fundamental act of the society: and such a change, however effected, is, according to Mr Locke, (who perhaps carries his theory too far), at once an entire dissolution of the bands of government; and the people are thereby reduced to a state of anarchy, with liberty to constitute to themselves a new legislative power.

Having thus cursorily considered the three usual species of government, and our own singular constitution selected and compounded from them all, we proceed to observe, that, as the power of making laws constitutes the supreme authority, so wherever the supreme authority in any state resides, it is the right of that authority to make laws; that is, in the words of our definition, *to prescribe the rule of civil action*. And this may be discovered from the very end and institution of civil states. For a state is a collective body, composed of a multitude of individuals, united for their safety and convenience, and intending to act together as one man. If it therefore is to act as one man, it ought to act by one uniform will. But, inasmuch as political communities are made up of many natural persons, each of whom has his particular will and inclination, these several wills cannot by any natural union be joined together, or tempered and disposed into a lasting harmony, so as to constitute and produce that one uniform will of the whole. It can therefore be no otherwise produced than by a political union; by the consent of all persons to submit their own private wills to the will of one man, or of one or more assemblies of men, to whom the supreme authority is entrusted; and this will of that one man, or assemblage of men, is in different states, according to their different constitutions, understood to be law.

Thus far as to the *right* of the supreme power to make laws: but farther, it is its *duty* likewise. For since the respective members are bound to conform themselves to the will of the state, it is expedient that they receive directions from the state declaratory of that its will. But as it is impossible, in so great a

multitude, to give injunctions to every particular man, relative to each particular action, therefore the state establishes general rules, for the perpetual information and direction of all persons in all points, whether of positive or negative duty. And this, in order that every man may know what to look upon as his own, what as another's; what absolute and what relative duties are required at his hands; what is to be esteemed honest, dishonest, or indifferent; what degree every man retains of his natural liberty, and what he has given up as the price of the benefits of society; and after what manner each person is to moderate the use and exercise of those rights which the state assigns him, in order to promote and secure the public tranquillity.

From what has been advanced, the truth of the former branch of our definition is (we trust) sufficiently evident; that "municipal law is a rule of civil conduct, prescribed by the supreme power in a state." We proceed now to the latter branch of it; that it is a rule so prescribed, "commanding what is right, and prohibiting what is wrong."

Now, in order to do this completely, it is first of all necessary that the boundaries of right and wrong be established and ascertained by law. And when this is once done, it will follow of course, that it is likewise the business of the law, considered as a rule of civil conduct, to enforce these rights, and to restrain or redress these wrongs. It remains therefore only to consider, in what manner the law is said to ascertain the boundaries of right and wrong; and the methods which it takes to command the one and prohibit the other.

For this purpose, every law may be said to consist of several parts: one, declaratory; whereby the rights to be observed, and the wrongs to be eschewed, are clearly defined and laid down: another, directory; whereby the subject is instructed and enjoined to observe those rights, and to abstain from the commission of those wrongs: a third, remedial; whereby a method is pointed out to recover a man's private rights, or redress his private wrongs: to which may be added a fourth, usually termed the *sanction*, or *vindictory* branch, of the law; whereby it is signified what evil or penalty shall be incurred by such as commit any public wrongs, and transgress or neglect their duty.

With regard to the first of these, the *declaratory* part of the municipal law; this depends not so much upon the law of revelation or of nature, as upon the wisdom and will of the legislator. This doctrine, which before was slightly touched, deserves a more particular explication. Those rights, then, which God and nature have established, and are therefore called *natural rights*, such as are life and liberty, need not the aid of human laws to be more effectually invested in every man than they are; neither do they receive any additional strength when declared by the municipal laws to be inviolable. On the contrary, no human legislature has power to abridge or destroy them, unless the owner shall himself commit some act that amounts to a forfeiture. Neither do divine or natural *duties* (such as, for instance, the worship of God, the maintenance of children, and the like) receive any stronger sanction from being also declared to be duties by the law of the land. The case is the same as to crimes and misdemeanors, that are forbidden by the superior laws, and therefore styled *mala in se*, such as murder, theft, and perjury; which

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which contract no additional turpitude from being declared unlawful by the inferior legislature. For that legislature in all these cases acts only, as was before observed, in subordination to the Great Lawgiver, transcribing and publishing his precepts. So that, upon upon the whole, the declaratory part of the municipal law has no force or operation at all, with regard to actions that are naturally and intrinsically right or wrong.

But with regard to things in themselves indifferent, the case is entirely altered. These become either right or wrong, just or unjust, duties or misdemeanors, according as the municipal legislator sees proper, for promoting the welfare of the society, and more effectually carrying on the purposes of civil life. Thus our own common law has declared, that the goods of the wife do instantly upon marriage become the property and right of the husband; and our statute law has declared all monopolies a public offence: yet that right, and this offence, have no foundation in nature; but are merely created by the law, for the purposes of civil society. And sometimes, where the thing itself has its rise from the law of nature, the particular circumstances and mode of doing it become right or wrong, as the laws of the land shall direct. Thus, for instance, in civil duties; obedience to superiors is the doctrine of revealed as well as natural religion: but who those superiors shall be, and in what circumstances, or to what degrees they shall be obeyed, is the province of human laws to determine. And so, as to injuries or crimes, it must be left to our own legislature to decide, in what cases the seizing another's cattle shall amount to the crime of robbery; and where it shall be a justifiable action, as when a landlord takes them by way of distress for rent.

Thus much for the declaratory part of the municipal law: and the *directory* stands much upon the same footing; for this virtually includes the former, the declaration being usually collected from the direction. The law that says, "Thou shalt not steal," implies a declaration that stealing is a crime. And we have seen, that, in things naturally indifferent, the very essence of right and wrong depends upon the direction of the laws to do or to omit them.

The *remedial* part of a law is so necessary a consequence of the former two, that laws must be very vague and imperfect without it. For in vain would rights be declared, in vain directed to be observed, if there were no method of recovering and asserting those rights when wrongfully withheld or invaded. This is what we mean properly, when we speak of the protection of the law. When, for instance, the declaratory part of the law has said, "that the field or inheritance, which belonged to Titius's father, is vested by his death in Titius;" and the directory part has "forbidden any one to enter on another's property, without the leave of the owner:" if Gaius after this will presume to take possession of the land, the remedial part of the law will then interpose its office; will make Gaius restore the possession to Titius, and also pay him damages for the invasion.

With regard to the sanction of laws, or the evil that may attend the breach of public duties; it is observed, that human legislators have for the most part chosen to make the sanction of their laws rather

vindictory than remuneratory, or to consist rather in punishments than in actual particular rewards: Because, in the first place, the quiet enjoyment and protection of all our civil rights and liberties, which are the sure and general consequence of obedience to the municipal law, are in themselves the best and most valuable of all rewards: because also, were the exercise of every virtue to be enforced by the proposal of particular rewards, it were impossible for any state to furnish stock enough for so profuse a bounty: and farther, because the dread of evil is a much more forcible principle of human actions than the prospect of good. For which reasons, though a prudent bestowing of rewards is sometimes of exquisite use, yet we find that those civil laws, which enforce and enjoin our duty, do seldom, if ever, propose any privilege or gift to such as obey the law; but do constantly come armed with a penalty denounced against transgressors, either expressly defining the nature and quantity of the punishment, or else leaving it to the discretion of the judges, and those who are entrusted with the care of putting the laws in execution.

Of all the parts of a law the most effectual is the *vindictory*. For it is but lost labour to say, "do this, or avoid that," unless we also declare, "this shall be the consequence of your non-compliance." We must therefore observe, that the main strength and force of a law consists in the penalty annexed to it. Herein is to be found the principal obligation of human laws.

Legislators and their laws are said to *compel* and *oblige*: not that, by any natural violence, they constrain a man as to render it impossible for him to act otherwise than as they direct, which is the strict sense of obligation: but because, by declaring and exhibiting a penalty against offenders, they bring it to pass that no man can easily choose to transgress the law; since, by reason of the impending correction, compliance is in a high degree preferable to disobedience. And, even where rewards are proposed as well as punishments threatened, the obligation of the law seems chiefly to consist in the penalty: for rewards, in their nature, can only persuade and allure; nothing is compulsory but punishment.

It is true, it hath been holden, and very justly, by the principal of our ethical writers, that human laws are binding upon mens consciences. But if that were the only or most forcible obligation, the good only would regard the laws, and the bad would let them at defiance. And, true as this principle is, it must still be understood with some restriction. It holds, we apprehend, as to *rights*; and that, when the law has determined the field to belong to Titius, it is matter of conscience no longer to withhold or to invade it. So also in regard to *natural duties*, and such offences as are *mala in se*: here we are bound in conscience, because we are bound by superior laws, before those human laws were in being, to perform the one and abstain from the other. But in relation to those laws which enjoin only positive duties, and forbid only such things as are not *mala in se*, but *mala prohibita* merely, without any intermixture of moral guilt, annexing a penalty to non-compliance; here seems to be conscience no farther concerned, than by directing a submission to the penalty, in case of our breach of those laws: for otherwise the multitude of penal laws in a state would

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Vindictory  
part.19  
Directory  
part.20  
Remedial  
part.

would not only be looked upon as an impolitic, but would also be a very wicked, thing; if every such law were a snare for the conscience of the subject. But in these cases the alternative is offered to every man; " either abstain from this, or submit to such a penalty:" and his conscience will be clear, whichever side of the alternative he thinks proper to embrace. Thus, by the statutes for preserving the game, a penalty is denounced against every unqualified person that kills a hare, and against every person who possesses a partridge in August. And so too, by other statutes, pecuniary penalties are inflicted for exercising trades without serving an apprentice ship thereto, for erecting cottages without annexing four acres of land to each, for not burying the dead in woollen, for not performing statute-work on the public roads, and for innumerable other positive misdemeanours. Now these prohibitory laws do not make the transgression a moral offence, or sin; the only obligation in conscience is to submit to the penalty if levied. It must, however, be observed, that we are here speaking of laws that are simply and purely penal, where the thing forbidden or enjoined is wholly a matter of indifference, and where the penalty inflicted is an adequate compensation for the civil inconvenience supposed to arise from the offence. But where disobedience to the law involves in it also any degree of public mischief or private injury, there it falls within our former distinction, and is also an offence against conscience.

We have now gone through the definition laid down of a municipal law, and have shewn that it is " a rule--of civil conduct--prescribed--by the supreme power in a state--commanding what is right, and prohibiting what is wrong:" in the explication of which we have endeavoured to interweave a few useful principles, concerning the nature of civil government, and the obligation of human laws. Before we conclude this part, it may not be amiss to add a few observations concerning the interpretation of laws.

When any doubt arose upon the construction of the Roman laws, the usage was to state the case to the emperor in writing, and take his opinion upon it. This was certainly a bad method of interpretation. To interrogate the legislature to decide particular disputes, is not only endless, but affords great room for partiality and oppression. The answers of the emperor were called his rescripts, and these had in succeeding cases the force of perpetual laws; though they ought to be carefully distinguished, by every rational civilian, from those general constitutions which had only the nature of things for their guide. The emperor Marcinus, as his historian Capitolinus informs us, had once resolved to abolish these rescripts, and retain only the general edicts: he could not bear that the hasty and crude answers of such princes as Commodus and Caracalla should be revered as laws. But Justinian thought otherwise, and he has preserved them all. In like manner the canon laws, or decretal epistles of the popes, are all of them rescripts in the strictest sense. Contrary to all true forms of reasoning, they argue from particulars to generals.

The fairest and most rational method to interpret the will of the legislator, is by exploring his intentions at the time when the law was made, by signs the most natural and probable. And these signs are either the

words, the context, the subject-matter, the effects and consequence, or the spirit and reason of the law. Let us take a short view of them all.

1. Words are generally to be understood in their usual and most known signification; not so much regarding the propriety of grammar, as their general and popular use. Thus the law mentioned by Puffendorf, which forbade a layman to lay hands on a priest, was adjudged to extend to him who had hurt a priest with a weapon. Again: Terms of art, or technical terms, must be taken according to the acceptance of the learned in each art, trade, and science. So in the act of settlement, where the crown of England is limited " to the princess Sophia, and the heirs of her body being Protestants," it becomes necessary to call in the assistance of lawyers, to ascertain the precise idea of the words " heirs of her body;" which in a legal sense comprise only certain of her lineal descendants. Lastly, where words are clearly repugnant in two laws, the later law takes place of the elder; *leges posteriores priores contrarias abrogant*, is a maxim of universal law, as well as of our own constitutions. And accordingly it was laid down by a law of the twelve tables at Rome, *quod populus postremum jussit, id jus ratum esto*.

2. If words happen to be still dubious, we may establish their meaning from the context; with which it may be of singular use to compare a word or a sentence, whenever they are ambiguous, equivocal, or intricate. Thus the proëme, or preamble, is often called in to help the construction of an act of parliament. Of the same nature and use is the comparison of a law with other laws, that are made by the same legislator, that have some affinity with the subject, or that expressly relate to the same point. Thus, when the law of England declares murder to be felony without benefit of clergy, we must resort to the same law of England to learn what the benefit of clergy is: and, when the common law censures simoniacal contracts, it affords great light to the subject to consider what the canon law has adjudged to be simony.

3. As to the subject-matter, words are always to be understood as having a regard thereto; for that is always supposed to be in the eye of the legislator, and all his expressions directed to that end. Thus, when a law of Edward III. forbids all ecclesiastical persons to purchase provisions at Rome, it might seem to prohibit the buying of grain and other victual; but when we consider that the statute was made to repress the usurpations of the papal see, and that the nominations to benefices by the Pope were called *provisions*, we shall see that the restraint is intended to be laid upon such provisions only.

4. As to the effects and consequence, the rule is, That where words bear either none, or a very absurd signification, if literally understood, we must a little deviate from the received sense of them. Therefore the Bolognian law, mentioned by Puffendorf, which enacted " that whoever drew blood in the streets should be punished with the utmost severity," was held after long debate not to extend to the surgeon who opened the vein of a person that fell down in the street with a fit.

5. But, lastly, the most universal and effectual way of discovering the true meaning of a law, when the words

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Of the interpretation of laws.

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words are dubious, is by considering the *reason* and *spirit* of it, or the cause which moved the legislator to enact it. For when this reason ceases, the law itself ought likewise to cease with it. An instance of this is given in a case put by Cicero, or whoever was the author of the rhetorical treatise inscribed to Herennius. There was a law, That those who in a storm forsook the ship should forfeit all property therein, and the ship and lading should belong entirely to those who staid in it. In a dangerous tempest, all the mariners forsook the ship, except only one sick passenger, who by reason of his disease was unable to get out and escape. By chance the ship came safe to port. The sick man kept possession, and claimed the benefit of the law. Now here all the learned agree, that the sick man is not within the reason of the law; for the reason of making it was, to give encouragement to such as should venture their lives to save the vessel: but this is a merit which he could never pretend to; who neither staid in the ship upon that account, nor contributed any thing to its preservation.

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Equity.

From this method of interpreting laws by the reason of them, arises what we call *equity*: which is thus defined by Grotius, "the correction of that, wherein the law (by reason of its universality) is deficient." For since in laws all cases cannot be foreseen or expressed, it is necessary, that, when the general decrees of the law come to be applied to particular cases, there should be somewhere a power vested of defining those circumstances, which (had they been foreseen) the legislator himself would have expressed. And these are the cases which, according to Grotius, "*lex non exakte definit, sed arbitrio boni viri permittit.*"

## PART II. THE LAW OF ENGLAND.

### INTRODUCTION.

THE municipal law of England, or the rule of civil conduct prescribed to the inhabitants of that kingdom, may with sufficient propriety be divided into two kinds: the *lex non scripta*, the unwritten or common law; and the *lex scripta*, the written or statute law.

The *lex non scripta*, or unwritten law, includes not only general customs, or the common law properly so called; but also the particular customs of certain parts of the kingdom, and likewise those particular laws that are by custom observed only in certain courts and jurisdictions.

In calling these parts of the law *leges non scriptæ*, we would not be understood as if all those laws were at present merely oral, or communicated from the former ages to the present solely by word of mouth. It is true indeed, that, in the profound ignorance of letters which formerly overpread the whole western world, all laws were entirely traditional; for this plain reason, that the nations among which they prevailed had but little idea of writing. Thus the British as well as the Gallic druids committed all their laws as well as learning to memory; and it is said of the primitive Saxons here, as well as their brethren on the continent, that *leges sola memoria et usu retinebant*. But, with us at present, the monuments and evidences of our legal cus-

Equity thus depending, essentially, upon the particular circumstances of each individual case, there can be no established rules and fixed precepts of equity laid down, without destroying its very essence, and reducing it to a positive law. And, on the other hand, the liberty of considering all cases in an equitable light, must not be indulged too far; lest thereby we destroy all law, and leave the decision of every question entirely in the breast of the judge. And law, without equity, tho' hard and disagreeable, is much more desirable for the public good, than equity without law; which would make every judge a legislator, and introduce most infinite confusion; as there would then be almost as many different rules of action laid down in our courts, as there are differences of capacity and sentiment in the human mind.

HAVING thus considered the nature of laws in general, we shall proceed to give a view of the particular laws of our own country; 1. Of England, 2. Of Scotland. The English law, however, being too extensive to admit of detail in a body, we can only here give such a sketch of it as may be sufficient to show the connection of its parts; but the principal of these parts themselves are explained at large, under their proper names, in the general alphabet.—A contrary method is followed with regard to the law of Scotland. This being less extensive, is given in a body, with all its parts not only in regular connection, but sufficiently explained; these parts, again, not being explained in the order of the alphabet, but marked with numerical references to their explanations in the system.

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Plan of the  
two follow-  
ing parts.

toms are contained in the records of the several courts of justice, in books of reports and judicial decisions, and in the treatises of learned sages of the profession, preserved and handed down to us from the times of highest antiquity. However, we therefore style these parts of our law *leges non scriptæ*, because their original institution and authority are not set down in writing, as acts of parliament are; but they receive their binding power, and the force of laws, by long and immemorial usage, and by their universal reception throughout the kingdom: in like manner as Aulus Gellius defines the *jus non scriptum* to be that, which is *tacite et illiterato hominum consensu et moribus expressum*.

Our ancient lawyers, and particularly Fortescue, insist with abundance of warmth, that these customs are as old as the primitive Britons, and continued down through the several mutations of government and inhabitants, to the present time, unchanged and unadulterated. This may be the case as to some. But in general, as Mr Selden in his notes observes, this assertion must be understood with many grains of allowance; and ought only to signify, as the truth seems to be, that there never was any formal exchange of one system of laws for another: though doublets, by the intermixture of adventitious nations, the Romans, the Picts, the Saxons, the Danes, and the Normans, they must have insensibly introduced and incorporated many of their own customs with those that were before established; thereby, in all probability,

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Common  
law.

improving the texture and wisdom of the whole, by the accumulated wisdom of divers particular countries. Our laws, faith lord Bacon, are mixed as our language; and as our language is so much the richer, the laws are the more complete.

And indeed our antiquarians and first historians do all positively assure us, that our body of laws is of this compounded nature. For they tell us, that in the time of Alfred the local customs of the several provinces of the kingdom were grown so various, that he found it expedient to compile his dome-book, or *liber judicialis*, for the general use of the whole kingdom. This book is said to have been extant so late as the reign of Edward the fourth, but is now unfortunately lost. It contained, we may probably suppose, the principal maxims of the common law, the penalties for misdemeanours, and the forms of judicial proceedings. Thus much may at least be collected from that injunction to observe it, which we find in the laws of king Edward the elder, the son of Alfred. *Omnibus qui reipublice prefunt etiam atque etiam mando, ut omnibus aequo se prebeant iudices, perinde ac in judiciali libro scriptum habetur: nec quicumq; forisment quin jus commune audacter libereque dicant.*

But the irruption and establishment of the Danes in England, which followed soon after, introduced new customs, and caused this code of Alfred in many provinces to fall into disuse, or at least to be mixed and debased with other laws of a coarser alloy. So that, about the beginning of the 11<sup>th</sup> century, there were three principal systems of laws prevailing in different districts. 1. The *Mercen-Lage*, or Mercian laws, which were observed in many of the inland counties, and those bordering on the principality of Wales, the retreat of the ancient Britons; and therefore very probably intermixed with the British or Druidical customs. 2. The *West Saxon-Lage*, or laws of the West Saxons, which obtained in the counties to the south and west of the island, from Kent to Devonshire. These were probably much the same with the laws of Alfred above-mentioned, being the municipal law of the far most considerable part of his dominions, and particularly including Berkshire, the seat of his peculiar residence. 3. The *Dane-Lage*, or Danish law, the very name of which speaks its original and composition. This was principally maintained in the rest of the midland counties, and also on the eastern coast, the part most exposed to the visits of that piratical people. As for the very northern provinces, they were at that time under a distinct government.

Out of these three laws, Roger Hoveden and Ranulphus Cestrensis inform us, king Edward the confessor extracted one uniform law, or digest of laws, to be observed throughout the whole kingdom; though Hoveden and the author of an old manuscript chronicle assure us likewise, that this work was projected and begun by his grandfather king Edgar. And indeed a general digest of the same nature has been constantly found expedient, and therefore put in practice by other great nations, which were formed from an assemblage of little provinces, governed by peculiar customs. As in Portugal, under king Edward, about the beginning of the 15<sup>th</sup> century. In Spain, under Alonzo X. who about the year 1250 executed the plan of his father St Ferdinand, and collected all the provincial customs

into one uniform law, in the celebrated code entitled *las partidas*. And in Sweden, about the same era, a universal body of common law was compiled out of the particular customs established by the laghman of every province, and entitled the *land's lagh*, being analogous to the common law of England.

Both these undertakings, of king Edgar and Edward the confessor, seem to have been no more than a new edition, or fresh promulgation, of Alfred's code or dome-book, with such additions and improvements as the experience of a century and an half had suggested. For Alfred is generally styled by the same historians the *legum Anglicanarum conditor*, as Edward the confessor is the *restitutor*. These, however, are the laws which our histories so often mention under the name of the *laws of Edward the confessor*; which our ancestors struggled so hardly to maintain, under the first princes of the Norman line; and which subsequent princes so frequently promised to keep and to restore, as the most popular act they could do, when pressed by foreign emergencies or domestic discontents. These are the laws, that so vigorously withstood the repeated attacks of the civil law; which established in the 12<sup>th</sup> century a new Roman empire over most of the states on the continent: states that have lost, and perhaps upon that account, their political liberties; while the free constitution of England, perhaps upon the same account, has been rather improved than debased. These, in short, are the laws which gave rise and original to that collection of maxims and customs which is now known by the name of the *common law*. A name either given to it, in contradistinction to other laws, as the statute law, the civil law, the law merchant, and the like; or, more probably, as a law common to all the realm, the *jus commune* or *folkrigt* mentioned by king Edward the elder, after the abolition of the several provincial customs and particular laws before-mentioned.

But though this is the most likely foundation of this collection of maxims and customs; yet the maxims and customs, so collected, are of higher antiquity than memory or history can reach: nothing being more difficult than to ascertain the precise beginning and first spring of an ancient and long-established custom. Whence it is that in our law the goodness of a custom depends upon its having been used time out of mind; or, in the solemnity of our legal phrase, time whereof the memory of man runneth not to the contrary. This it is that gives it its weight and authority; and of this nature are the maxims and customs which compose the common law, or *lex non scripta*, of this kingdom.

This unwritten, or common law, is properly distinguishable into three kinds: 1. General customs; which are the universal rule of the whole kingdom, and form the common law in its stricter and more usual signification. 2. Particular customs; which for the most part affect only the inhabitants of particular districts. 3. Certain particular laws; which by custom are adopted and used by some particular courts, of pretty general and extensive jurisdiction.

1. As to general customs, or the common law properly so called; this is that law, by which proceedings and determinations in the king's ordinary courts of justice are guided and directed. This, for the most part, settles the course in which lands descend by inheritance;

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written law:  
General  
customs.

heritance; the manner and form of acquiring and transferring property; the solemnities and obligation of contracts; the rules of expounding wills, deeds, and acts of parliament; the respective remedies of civil injuries; the several species of temporal offences, with the manner and degree of punishment; and an infinite number of minuter particulars, which diffuse themselves as extensively as the ordinary distribution of common justice requires. Thus, for example, that there shall be four superior courts of record, the chancery, the king's bench, the common pleas, and the exchequer;---that the eldest son alone is heir to his ancestor;---that property may be acquired and transferred by writing;---that a deed is of no validity unless sealed and delivered;---that wills shall be construed more favourably, and deeds more strictly;---that money lent upon bond is recoverable by action of debt;---that breaking the public peace is an offence, and punishable by fine and imprisonment;---all these are doctrines that are not set down in any written statute or ordinance; but depend merely upon immemorial usage, that is, upon common law, for their support.

Some have divided the common law into two principal grounds or foundations: 1. Established customs; such as that, where there are three brothers, the eldest brother shall be heir to the second, in exclusion of the youngest: and, 2. Established rules and maxims; as, "that the king can do no wrong, that no man shall be bound to accuse himself," and the like. But these seem to be one and the same thing. For the authority of these maxims rests entirely upon general reception and usage; and the only method of proving that this or that maxim is a rule of the common law, is by shewing that it hath been always the custom to observe it.

But here a very natural, and very material, question arises: How are these customs or maxims to be known, and by whom is their validity to be determined? The answer is, By the judges in the several courts of justice. They are the depositary of the laws; the living oracles who must decide in all cases of doubt, and who are bound by an oath to decide according to the law of the land. Their knowledge of that law is derived from experience and study; from the *viginti annorum lucubrations*, which Fortescue mentions; and from being long personally accustomed to the judicial decisions of their predecessors. And indeed these judicial decisions are the principal and most authoritative evidence, that can be given, of the existence of such a custom as shall form a part of the common law. The judgment itself, and all the proceedings previous thereto, are carefully registered and preserved under the name of *records*, in public repositories set apart for that particular purpose; and to them frequent recourse is had, when any critical question arises, in the determination of which former precedents may give light or assistance. And therefore, even so early as the conquest, we find the *præteritorum memoria eventorum* reckoned up as one of the chief qualifications of those who were held to be *legibus patriæ optime instituti*. For it is an established rule, To abide by former precedents, where the same points come again in litigation: as well to keep the scale of justice even and steady, and not liable to waver with every new judge's opinion; as also because the law in that case being solemnly declared and determined, what before was uncertain, and perhaps indifferent, is

now become a permanent rule, which it is not in the breast of any subsequent judge to alter or vary from according to his private sentiments: he being sworn to determine, not according to his own private judgment, but according to the known laws and customs of the land; not delegated to pronounce a new law, but to maintain and expound the old one. Yet this rule admits of exception, where the former determination is most evidently contrary to reason; much more if it be contrary to the divine law. But, even in such cases, the subsequent judges do not pretend to make a new law, but to vindicate the old one from misrepresentation. For if it be found that the former decision is manifestly absurd or unjust, it is declared, not that such a sentence was bad law, but that it was not law; that is, that it is not the established custom of the realm, as has been erroneously determined. And hence it is that our lawyers are with justice so captious in their economies on the reason of the common law; that they tell us, that the law is the perfection of reason, that it always intends to conform thereto, and that what is not reason is not law. Not that the particular reason of every rule in the law can at this distance of time be always precisely assigned; but it is sufficient that there be nothing in the rule flatly contradictory to reason, and then the law will presume it to be well founded. And it hath been an ancient observation in the laws of England, that whenever a standing rule of law, of which the reason perhaps could not be remembered or discerned, hath been wantonly broke in upon by statutes or new resolutions, the wisdom of the rule hath in the end appeared from the inconveniences that have followed the innovation.

The doctrine of the law then is this: That precedents and rules must be followed, unless flatly absurd or unjust: for though their reason be not obvious at first view, yet we owe such a deference to former times, as not to suppose they acted wholly without consideration. To illustrate this doctrine by examples. It has been determined, time out of mind, that a brother of the half blood shall never succeed as heir to the estate of his half brother, but it shall rather escheat to the king, or other superior lord. Now this is a positive law, fixed and established by custom; which custom is evidenced by judicial decisions; and therefore can never be departed from by any modern judge without a breach of his oath and the law. For herein there is nothing repugnant to natural justice; though the artificial reason of it, drawn from the feudal law, may not be quite obvious to every body. And therefore, on account of a supposed hardship upon the half brother, a modern judge might with it had been otherwise settled; yet it is not in his power to alter it. But if any court were now to determine, that an elder brother of the half blood might enter upon and seize any lands that were purchased by his younger brother, no subsequent judges would scruple to declare that such prior determination was unjust, was unreasonable, and therefore was not law. So that, the law, and the opinion of the judge, are not always convertible terms, or one and the same thing; since it sometimes may happen that the judge may mistake the law. Upon the whole, however, we may take it as a general rule, "That the decisions of courts of justice are the evidence of what is common law;" in the same manner as, in the civil law,



law, what the emperor had once determined was to serve for a guide for the future.

The decisions therefore of courts are held in the highest regard, and are not only preserved as authentic records in the treasuries of the several courts, but are handed out to public view in the numerous volumes of reports which furnish the lawyer's library. These reports are histories of the several cases, with a short summary of the proceedings, which are preserved at large in the record; the arguments on both sides, and the reasons the court gave for its judgment; taken down in short notes by persons present at the determination. And these serve as indexes to, and also to explain, the records; which always, in matters of consequence and nicety, the judges direct to be searched. The reports are extant in a regular series from the reign of king Edward the second inclusive; and from his time to that of Henry the eighth were taken by the prothonotaries, or chief scribes of the court, at the expense of the crown, and published annually, whence they are known under the denomination of the *year-books*. And it is much to be wished that this beneficial custom had, under proper regulations, been continued to this day: for, though king James the first, at the instance of lord Bacon, appointed two reporters with a handsome stipend, for this purpose; yet that wise institution was soon neglected, and from the reign of Henry the eighth to the present time this task has been executed by many private and cotemporary hands; who sometimes through haste and inaccuracy, sometimes through mistake and want of skill, have published very crude and imperfect (perhaps contradictory) accounts of one and the same determination. Some of the most valuable of the ancient reports are those published by lord chief justice Coke; a man of infinite learning in his profession, though not a little infected with the pedantry and quaintness of the times he lived in, which appear strongly in all his works. However, his writings are so highly esteemed, that they are generally cited without the author's name (A).

Besides these reporters, there are also other authors, to whom great veneration and respect are paid by the students of the common law. Such are Glanvil and Bracton, Britton and Fleta, Littleton and Fitzherbert, with some others of ancient date, whose treatises are cited as authority; and are evidence that cases have formerly happened in which such and such points were determined, which are now become settled and first principles. One of the last of these methodical writers in point of time, whose works are of any intrinsic authority in the courts of justice, and do not entirely depend on the strength of their quotations from older authors, is the same learned judge we have just mentioned, Sir Edward Coke; who hath written four volumes of Institutes, as he is pleased to call them, though they have little of the institutional method to warrant

such a title. The first volume is a very extensive comment upon a little excellent treatise of tenures, compiled by judge Littleton in the reign of Edward the fourth. This comment is a rich mine of valuable common-law learning, collected and heaped together from the ancient reports and year-books, but greatly defective in method (B). The second volume is a comment upon many old acts of parliament, without any systematical order; the third a more methodical treatise of the pleas of the crown; and the fourth an account of the several species of courts (C).

And thus much for the first ground and chief cornerstone of the laws of England; which is general immemorial custom, or common law, from time to time declared in the decisions of the courts of justice; which decisions are preserved among the public records, explained in the reports, and digested for general use in the authoritative writings of the venerable sages of the law.

The Roman law, as practised in the times of its liberty, paid also a great regard to custom; but not so much as our law: it only then adopting it, when the written law was deficient. Though the reasons alleged in the digest will fully justify our practice, in making it of equal authority with, when it is not contradicted by, the written law. "For since (says Julianus) the written law binds us for no other reason but because it is approved by the judgment of the people, therefore those laws which the people have approved without writing ought also to bind every body. For where is the difference, whether the people declare their assent to a law by suffrage, or by a uniform course of acting accordingly?" Thus did they reason while Rome had some remains of her freedom; but, when the imperial tyranny came to be fully established, the civil laws speak a very different language. *Quod principi placuit legis habet vigorem, cum populus ei et in eum omne suum imperium et potestatem conferat*, says Ulpian. *Imperator solus et conditor et interpres legis existimatur*, says the code. And again, *Sacrillegii instar est rescripto principis obviari*. And indeed it is one of the characteristic marks of British liberty, that the common law depends upon custom; which carries this internal evidence of freedom along with it, that it probably was introduced by the voluntary consent of the people.

II. The second branch of the unwritten laws of England are particular customs, or laws which affect only the inhabitants of particular districts.

These particular customs, or some of them, are without doubt the remains of that multitude of local customs before-mentioned, out of which the common law, as it now stands, was collected at first by king Alfred, and afterwards by king Edgar and Edward the confessor: each district mutually sacrificing some of its own special usages, in order that the whole kingdom

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(A) His reports, for instance, are styled *cas' reportz*, "the reports;" and in quoting them we usually say, 1 or 2 Rep. not 1 or 2 Coke's Rep. as in citing other authors. The reports of judge Croke are also cited in a peculiar manner, by the name of those princes in whose reigns the cases reported in his three volumes were determined; viz. queen Elizabeth, king James, and king Charles the first; as well as by the number of each volume. For sometimes we call them 1, 2, and 3 Cro.; but more commonly Cro. Eliz. Cro. Jac. and Cro. Car.

(B) It is usually cited either by the name of Co. Litt. or as 1 Inst.

(C) These are cited as 2, 3, or 4 Inst. without any author's name. An honorary distinction, which, we observed, is paid to the works of no other writer: the generality of reports and other tracts being quoted in the name of the compiler, as 2 Ventris, 4 Leonard, 1 Siderfin, and the like.

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might enjoy the benefit of one uniform and universal system of laws. But, for reasons that have been now long forgotten, particular counties, cities, towns, manors, and lordships, were very early indulged with the privilege of abiding by their own customs, in contradistinction to the rest of the nation at large: which privilege is confirmed to them by several acts of parliament.

Such is the custom of gavelkind in Kent and some other parts of the kingdom (though perhaps it was also general till the Norman conquest); which ordains, among other things, that not the eldest son only of the father shall succeed to his inheritance, but all the sons alike; and that, though the ancestor be attainted and hanged, yet the heir shall succeed to his estate, without any escheat to the lord.---Such is the custom that prevails in divers ancient boroughs, and therefore called *borough-english*, that the youngest son shall inherit the estate, in preference to all his elder brothers.---Such is the custom in other boroughs, that a widow shall be intitled, for her dower, to all her husband's lands; whereas at the common law she shall be endowed of one third part only.---Such also are the special and particular customs of manors, of which every one has more or less, and which bind all the copyhold tenants that hold of the said manors.---Such likewise is the custom of holding divers inferior courts, with power of trying causes, in cities and trading towns; the right of holding which, when no royal grant can be shewn, depends entirely upon immemorial and established usage.---Such, lastly, are many particular customs within the city of London, with regard to trade, apprentices, widows, orphans, and a variety of other matters. All these are contrary to the general law of the land, and are good only by special usage; though the customs of London are also confirmed by act of parliament.

To this head may most properly be referred a particular system of customs used only among one set of the king's subjects, called the *custom of merchants*, or *lex mercatoria*: which, however different from the general rules of the common law, is yet ingrafted into it, and made a part of it; being allowed, for the benefit of trade, to be of the utmost validity in all commercial transactions; for it is a maxim of law, that *cuiuslibet in sua arte credendum est*.

The rules relating to particular customs regard either the *proof* of their existence; their *legality* when proved; or their usual method of *allowance*. And first we will consider the rules of *proof*.

As to gavelkind, and borough-english, the law takes particular notice of them; and there is no occasion to prove, that such customs actually exist, but only that the lands in question are subject thereto. All other private customs must be particularly pleaded; and as well the existence of such customs must be shewn, as that the thing in dispute is within the custom alleged. The trial in both cases (both to shew the existence of the custom, as, "that in the manor of Dale lands shall descend only to the heirs male, and never to the heirs female;" and also to shew "that the lands in question are within that manor") is by a jury of 12 men, and not by the judges; except the same particular custom has been before tried, determined, and recorded, in the same court.

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The customs of London differ from all others in point of trial: for, if the existence of the custom be brought in question, it shall not be tried by a jury, but by certificate from the lord mayor and aldermen by the mouth of their recorder; unless it be such a custom as the corporation is itself interested in, as a right of taking toll, &c. for then the law permits them not to certify on their own behalf.

When a custom is actually proved to exist, the next inquiry is into the *legality* of it; for, if it is not a good custom, it ought to be no longer used. *Malus usus abolendus est*, is an established maxim of the law. To make a particular custom good, the following are necessary requisites.

1. That it have been used so long, that the memory of man runneth not to the contrary. So that, if any one can shew the beginning of it, it is no good custom. For which reason, no custom can prevail against an express act of parliament; since the statute itself is a proof of a time when such a custom did not exist.

2. It must have been *continued*. Any interruption would cause a temporary ceasing: the revival gives it a new beginning, which will be within time of memory, and thereupon the custom will be void. But this must be understood with regard to an interruption of the right; for an interruption of the possession only, for 10 or 20 years, will not destroy the custom. As if the inhabitants of a parish have a customary right of watering their cattle at a certain pool, the custom is not destroyed though they do not use it for 10 years; it only becomes more difficult to prove: but if the right be any how discontinued for a day, the custom is quite at an end.

3. It must have been *peaceable*, and acquiesced in; not subject to contention and dispute. For as customs owe their original to common consent, their being immemorably disputed, either at law or otherwise, is a proof that such consent was wanting.

4. Customs must be *reasonable*; or rather, taken negatively, they must not be unreasonable. Which is not always, as Sir Edward Coke says, to be understood of every unlearned man's reason; but of artificial and legal reason, warranted by authority of law. Upon which account a custom may be good, though the particular reason of it cannot be assigned; for it sufficeth, if no good legal reason can be assigned against it. Thus a custom in a parish, that no man shall put his beasts into the common till the third of October, would be good; and yet it would be hard to shew the reason why that day in particular is fixed upon, rather than the day before or after. But a custom, that no cattle shall be put in till the lord of the manor has first put in his, is unreasonable, and therefore bad: for peradventure the lord will never put in his; and then the tenants will lose all their profits.

5. Customs ought to be *certain*. A custom, that lands shall descend to the most worthy of the owner's blood, is void; for how shall this worth be determined? but a custom to descend to the next male of the blood exclusive of females, is certain, and therefore good. A custom to pay two pence an acre in lieu of tithes, is good; but to pay sometimes two pence and sometimes three pence, as the occupier of the land pleases, is bad for its uncertainty. Yet a custom, to pay a year's improved value for a fine on a copyhold estate, is good; though

though the value is a thing uncertain; for the value may at any time be ascertained; and the maxim of law is, *Id certum est, quod certum reddi potest*.

6. Customs, though established by consent, must be (when established) *compulsory*; and not left to the option of every man, whether he will use them or no. Therefore a custom, that all the inhabitants shall be rated toward the maintenance of a bridge, will be good; but a custom, that every man is to contribute thereto at his own pleasure, is idle and absurd, and indeed no custom at all.

7. Lastly, customs must be *consistent* with each other. One custom cannot be set up in opposition to another. For if both are really customs, then both are of equal antiquity, and both established by mutual consent: which to say of contradictory customs, is absurd. Therefore, if one man prescribes that by custom he has a right to have windows looking into another's garden; the other cannot claim a right by custom to stop up or obstruct those windows: for these two contradictory customs cannot both be good, nor both stand together. He ought rather to deny the existence of the former custom.

Next, as to the *allowance* of special customs. Customs, in derogation of the common law, must be construed strictly. Thus, by the custom of gavelkind, an infant of 15 years may by one species of conveyance (called a *deed of feoffment*) convey away his lands in fee simple, or for ever. Yet this custom does not empower him to use any other conveyance, or even to lease them for seven years: for the custom must be strictly pursued. And, moreover, all special customs must submit to the king's prerogative. Therefore, if the king purchases lands of the nature of gavelkind, where all the sons inherit equally; yet, upon the king's demise, his eldest son shall succeed to those lands alone. And thus much for the second part of the *leges non scriptæ*, or those particular customs which affect particular persons or districts only.

III. The third branch of them are those peculiar laws which by custom are adopted and used only in certain peculiar courts and jurisdictions. And by these are understood the civil and canon laws.

It may seem a little improper, at first view, to rank these laws under the head of *leges non scriptæ*, or unwritten laws, seeing they are set forth by authority in their pandects, their codes, and their institutions; their councils, decrees, and decretals; and enforced by an immense number of expositions, decisions, and treatises of the learned in both branches of the law. But this is done after the example of Sir Matthew Hale, because it is most plain, that it is not on account of their being written laws, that either the canon law, or the civil law, have any obligation within this kingdom: neither do their force and efficacy depend upon their own intrinsic authority; which is the case of our written laws or acts of parliament. They bind not the subjects of England, because their materials were collected from popes or emperors; were digested by Justinian, or declared to be authentic by Gregory. These considerations give them no authority here: for the legislature of England doth not, nor ever did, recognize any foreign power, as superior or equal to it in this kingdom; or as having the right to give law to any, the meanest, of its subjects. But all the strength that either the pa-

pal or imperial laws have obtained in this realm (or indeed in any other kingdom in Europe) is only because they have been admitted and received by immemorial usage and custom in some particular cases, and some particular courts; and then they form a branch of the *leges non scriptæ*, or customary law: or else, because they are in some other cases introduced by consent of parliament, and then they owe their validity to the *leges scriptæ*, or statute law. This is expressly declared in those remarkable words of the statute 25 Hen. VIII. c. 21. addressed to the king's royal majesty.—"This your grace's realm, recognizing no further perior under God but only your grace, hath been and is free from subjection to any man's laws, but only to such as have been devised, made, and ordained within this realm for the wealth of the same; or to such other as, by suffurance of your grace and your progenitors, the people of this your realm have taken at their free liberty, by their own consent, to be used among them; and have bound themselves by long use and custom to the observance of the same: not as to the observance of the laws of any foreign prince, potentate, or prelate; but as to the custom and ancient laws of this realm, originally established as laws of the same, by the said suffurance, consents, and custom; and none otherwise."

1. By the civil law, absolutely taken, is generally understood the civil or municipal law of the Roman empire, as comprised in the institutes, the code, and the digest of the emperor Justinian, and the novel constitutions of himself and some of his successors; of which it may not be amiss to give a short and general account.

The Roman law (founded first upon the regal constitutions of their ancient kings, next upon the 12 tables of the decemviri, then upon the laws or statutes enacted by the senate or people, the edicts of the prætor, and the *responsa prudentum* or opinions of learned lawyers, and lastly upon the imperial decrees or constitutions of successive emperors) had grown to so great a bulk, or, as Livy expresses it, *tam immensus aliarum super alias accretarum legum cumulus*, that they were computed to be many camels load by an author who preceded Justinian. This was in part remedied by the collections of three private lawyers, Gregorius, Hermogenes, and Papirius; and then by the emperor Theodosius the younger, by whose orders a code was compiled, A. D. 438, being a methodical collection of all the imperial constitutions then in force: which Theodosian code was the only book of civil law received as authentic in the western part of Europe, till many centuries after; and to this it is probable that the Franks and Goths might frequently pay some regard, in framing legal constitutions for their newly erected kingdoms. For Justinian commanded only in the eastern remains of the empire; and it was under his auspices, that the present body of civil law was compiled and finished by Tribonian and other lawyers, about the year 529.

This consists of, 1. The institutes; which contain the elements or first principles of the Roman law, in four books. 2. The digests or pandects, in 50 books; containing the opinions and writings of eminent lawyers, digested in a systematical method. 3. A new code, or collection of imperial constitutions; the lapse



of a whole century having rendered the former code of Theodosius imperfect. 4. The novels, or new constitutions, posterior in time to the other books, and amounting to a supplement to the code; containing new decrees of successful emperors, as new questions happened to arise. These form the body of Roman law, or *corpus juris civilis*, as published about the time of Justinian; which, however, fell soon into neglect and oblivion, till about the year 1190, when a copy of the digests was found at Amalfi in Italy; which accident, concurring with the policy of the Roman ecclesiastics, suddenly gave new vogue and authority to the civil law, introduced it into several nations, and occasioned that mighty inundation of voluminous comments, with which this system of law, more than any other, is now loaded.

2. The canon law is a body of Roman ecclesiastical law, relative to such matters as that church either has, or pretends to have, the proper jurisdiction over. This is compiled from the opinions of the ancient Latin fathers, the decrees of general councils, the decretal epistles and bulles of the holy see. All which lay in the same disorder and confusion as the Roman civil law: till, about the year 1151, one Gratian an Italian monk, animated by the discovery of Justinian's pandects, reduced the ecclesiastical constitutions also into some method, in three books; which he entitled *Concordia discordantium canonum*, but which are generally known by the name of *Decretum Gratiani*. These reached as low as the time of pope Alexander III. The subsequent papal decrees, to the pontificate of Gregory IX. were published in much the same method under the auspices of that pope, about the year 1230, in five books; entitled *Decretalia Gregorii noni*. A sixth book was added by Boniface VIII. about the year 1298, which is called *Sextus Decretalium*. The Clementine constitutions, or decrees of Clement V. were in like manner authenticated in 1317 by his successor John XXII.; who also published 20 constitutions of his own, called the *Extravagantes Joannis*: all which in some measure answer to the novels of the civil law. To these have been since added some decrees of later popes in five books, called *Extravagantes Communes*. And all these together, Gratian's decree, Gregory's decretals, the sixth decretal, the Clementine constitutions, and the extravagants of John and his successors, form the *corpus juris canonici*, or body of the Roman canon law.

Besides these pontifical collections, which during the times of popery were received as authentic in this island, as well as in other parts of Christendom, there is also a kind of national canon law, composed of legatine and provincial constitutions, and adapted only to the exigencies of this church and kingdom. The legatine constitutions were ecclesiastical laws, enacted in national synods, held under the cardinals Otho and Othobon, legates from pope Gregory IX. and pope Clement IV. in the reign of king Henry III. about the years 1220 and 1268. The provincial constitutions are principally the decrees of provincial synods, held under divers archbishops of Canterbury, from Stephen Langton in the reign of Henry III. to Henry Chichele in the reign of Henry V.; and adopted also by the province of York in the reign of Henry VI. At the dawn of the reformation, in the reign of king

Henry VIII. it was enacted in parliament, that a review should be had of the canon law; and till such review should be made, all canons, constitutions, ordinances and synodals provincial, being then already made, and not repugnant to the law of the land or the king's prerogative, should still be used and executed. And, as no such review has yet been perfected, upon this statute now depends the authority of the canon law in England.

As for the canons enacted by the clergy under James I. in the year 1603, and never confirmed in parliament, it has been solemnly adjudged upon the principles of law and the constitution, that where they are not merely declaratory of the ancient canon law, but are introductory of new regulations, they do not bind the laity, whatever regard the clergy may think proper to pay them.

There are four species of courts, in which the civil and canon laws are permitted under different restrictions to be used. 1. The courts of the archbishops and bishops, and their derivative officers; usually called *courts Christian*, (*curie Christianitatis*), or the *ecclesiastical courts*. 2. The military courts. 3. The courts of admiralty. 4. The courts of the two universities. In all, their reception in general, and the different degrees of that reception, are grounded entirely upon custom; corroborated in the latter instance by act of parliament, ratifying those charters which confirm the customary law of the universities. The more minute consideration of them will fall under their proper articles. It will suffice at present to remark a few particulars relative to them all, which may serve to inculcate more strongly the doctrine laid down concerning them.

1. And first, the courts of common law have the superintendency over these courts; to keep them within their jurisdictions; to determine wherein they exceed them; to restrain and prohibit such excess; and (in case of contumacy) to punish the officer who executes, and in some cases the judge who enforces, the sentence so declared to be illegal.

2. The common law has reserved to itself the exposition of all such acts of parliament, as concern either the extent of these courts, or the matters depending before them. And therefore, if these courts either refuse to allow these acts of parliament, or will expound them in any other sense than what the common law puts upon them, the king's courts at Westminster will grant prohibitions to restrain and control them.

3. An appeal lies from all these courts to the king, in the last resort; which proves that the jurisdiction exercised in them is derived from the crown of England, and not from any foreign potentate, or intrinsic authority of their own.---And, from these three strong marks and ensigns of superiority, it appears beyond a doubt, that the civil and canon laws, though admitted in some cases by custom in some courts, are only subordinate and *leges sub graviore lege*; and that thus admitted, restrained, altered, new-modelled, and amended, they are by no means with us a distinct independent species of laws, but are inferior branches of the customary or unwritten laws of England, properly called the *king's ecclesiastical*, the *king's military*, the *king's maritime*, or the *king's academical*, laws.

Let us next proceed to the *leges scripte*, the written laws

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laws of the kingdom; which are statutes, acts, or edicts, made by the king's majesty, by and with the advice of the lords spiritual and temporal and commons in parliament assembled. The oldest of these now extant, and printed in our statute books, is the famous *magna carta*, as confirmed in parliament 9 Hen. III. though doubtless there were many acts before that time, the records of which are now lost, and the determinations of them perhaps at present currently received for the maxims of the old common law.

The manner of making these statutes being explained under the articles BILL and PARLIAMENT, we shall here only take notice of the different kinds of statutes; and of some general rules with regard to their construction (D).

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Kinds of  
statutes.

First, as to their several kinds. Statutes are either *general* or *special*, public or private. A general or public act is an universal rule that regards the whole community; and of this the courts of law are bound to take notice judicially and *ex officio*, without the statute being particularly pleaded, or formally set forth, by the party who claims an advantage under it. Special or private acts are rather exceptions than rules, being those which only operate upon particular persons and private concerns; such as the Romans entitled *senatus-decreta*, in contradistinction to the *senatus-consulta*, which regarded the whole community; and of these the judges are not bound to take notice, unless they be formally shewn and pleaded. Thus, to shew the distinction, the statute 13 Eliz. c. 10. to prevent spiritual persons from making leases for longer terms than 21 years or three lives, is a public act; it being a rule prescribed to the whole body of spiritual persons in the nation; but an act to enable the bishop of Chester to make a lease to A. B. for 60 years, is an exception to this rule; it concerns only the parties and the bishop's successors, and is therefore a private act.

Statutes also are either *declaratory* of the common law, or *remedial* of some defects therein. Declaratory, where the old custom of the kingdom is almost fallen into disuse, or become disputable; in which case the parliament has thought proper, *in perpetuum rei testimonium*, and for avoiding all doubts and difficulties, to declare what the common law is and ever hath been. Thus the statute of treasons, 25 Edw. III. cap. 2. doth not make any new species of treasons; but only, for the benefit of the subject, declares and enumerates those several kinds of offence which before were treason at the common law. Remedial statutes are those which are made to supply such defects, and abridge such superfluities, in the common law, as arise either from the general imperfection of all human laws, from

change of time and circumstances, from the mistakes and unadvised determinations of unlearned judges, or from any other cause whatsoever. And this being done, either by enlarging the common law where it was too narrow and circumscribed, or by restraining it where it was too lax and luxuriant, hath occasioned another subordinate division of remedial acts of parliament into *enlarging* and *restraining* statutes. To instance again in the case of treason. Clipping the current coin of the kingdom was an offence not sufficiently guarded against by the common law: therefore it was thought expedient by statute 5 Eliz. c. 11. to make it high treason, which it was not at the common law: so that this was an *enlarging* statute. At common law, also, spiritual corporations might lease out their estates for any term of years, till prevented by the statute 13 Eliz. before-mentioned: this was therefore a *restraining* statute.

Secondly, the rules to be observed with regard to the construction of statutes are principally these which follow.

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Construction  
of  
statutes.

1. There are three points to be considered in the construction of all remedial statutes; the old law, the mischief, and the remedy: that is, how the common law stood at the making of the act; what the mischief was, for which the common law did not provide; and what remedy the parliament hath provided to cure this mischief. And it is the business of the judges so to construe the act, as to suppress the mischief and advance the remedy. Let us instance again in the same restraining statute of 13 Eliz. c. 10. By the common law, ecclesiastical corporations might let as long leases as they thought proper: the mischief was, that they let long and unreasonable leases, to the impoverishment of their successors: the remedy applied by the statute was by making void all leases by ecclesiastical bodies for longer terms than three lives or 21 years. Now in the construction of this statute it is held, that leases, tho' for a longer term, if made by a bishop, are not void during the bishop's continuance in his see; or, if made by a dean and chapter, they are not void during the continuance of the dean; for the act was made for the benefit and protection of the successor. The mischief is therefore sufficiently suppressed by vacating them after the determination of the interest of the granters; but the leases, during their continuance, being not within the mischief, are not within the remedy.

2. A statute, which treats of things or persons of an inferior rank, cannot by any *general words* be extended to those of a superior. So a statute, treating of "deans, prebendaries, parsons, vicars, and others

having

(D) The method of citing these acts of parliament is various. Many of the ancient statutes are called after the name of the place where the parliament was held that made them; as the statutes of Merton and Marleberge, of Westminster, Gloucester, and Winchester. Others are denominated entirely from their subject; as the statutes of Wales and Ireland, the *articuli clerici*, and the *prærogativa regis*. Some are distinguished by their initial words, a method of citing very ancient: being used by the Jews, in denominating the books of the pentateuch; by the Christian church, in distinguishing their hymns and divine offices; by the Romanists, in describing their papal bulles; and in short by the whole body of ancient civilians and canonists, among whom this method of citation generally prevailed, not only with regard to chapters, but inferior sections also; in imitation of all which we still call some of the old statutes by their initial words, as the statute of *quia emptores*, and that of *circumspicite agatis*. But the most usual method of citing them, especially since the time of Edward the second, is by naming the year of the king's reign in which the statute was made, together with the chapter or particular act, according to its numeral order; as, 9 Geo. II. c. 4. For all the acts of one session of parliament taken together make properly but one statute; and therefore, when two sessions have been held in one year, we usually mention stat. 1. or 2. Thus the bill of rights is cited, as 1 W. & M. st. 2. c. 2. signifying that it is the second chapter or act of the second statute or the laws made in the second sessions of parliament held in the first year of king William and queen Mary.

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having spiritual promotion," is held not to extend to bishops, though they have spiritual promotion; deans being the highest persons named, and bishops being of a still higher order.

3. Penal statutes must be construed strictly. Thus the statute 1 Edw. VI. c. 12. having enacted that those who are convicted of stealing *horses* should not have the benefit of clergy, the judges conceived that this did not extend to him who should steal but one *horse*, and therefore procured a new act for that purpose in the following year. And, to come nearer to our own times, by the statute 14 Geo. II. c. 6. stealing *sheep or other cattle*, was made felony without benefit of clergy. But these general words, "or other cattle," being looked upon as much too loose to create a capital offence, the act was held to extend to nothing but mere sheep. And therefore, in the next sessions, it was found necessary to make another statute, 15 Geo. II. c. 34. extending the former to bulls, cows, oxen, steers, bullocks, heifers, calves, and lambs, by name.

4. Statutes against frauds are to be liberally and beneficially expounded. This may seem a contradiction to the last rule; most statutes against frauds being in their consequences penal. But this difference is here to be taken: where the statute acts upon the offender, and inflicts a penalty, as the pillory or a fine, it is then to be taken strictly; but when the statute acts upon the offence, by setting aside the fraudulent transaction, here it is to be construed liberally. Upon this footing the statute of 13 Eliz. c. 5. which voids all gifts of goods, &c. made to defraud creditors and others, was held to extend by the general words to a gift made to defraud the queen of a forfeiture.

5. One part of a statute must be so construed by another, that the whole may (if possible) stand: *ut res magis valeat quam pereat*. As if land be vested in the king and his heirs by act of parliament, saving the right of A; and A has at that time a lease of it for three years; here A shall hold it for his term of three years, and afterwards it shall go to the king. For this interpretation furnishes matter for every clause of the statute to work and operate upon. But,

6. A saving, totally repugnant to the body of the act, is void. If therefore an act of parliament vests land in the king and his heirs, saving the right of all persons whatsoever; or vests the land of A in the king, saving the right of A: in either of these cases the saving is totally repugnant to the body of the statute, and (if good) would render the statute of no effect or operation; and therefore the saving is void, and the land vests absolutely in the king.

7. Where the common law and a statute differ, the common law gives place to the statute; and an old statute gives place to a new one. And this upon the general principle laid down in the last section, that *leges posteriores priores contrarias abrogant*. But this is to be understood, only when the latter statute is couched in negative terms, or by its matter necessarily implies a negative. As if a former act says, that a juror upon such a trial shall have twenty pounds a-year, and a new statute comes and says he shall have twenty marks; here the latter statute, tho' it does not express, yet necessarily implies, a negative, and virtually repeals the former. For if twenty marks be made qualification sufficient, the former statute which requires twenty

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pounds is at an end. But if both acts be merely affirmative, and the substance such that both may stand together, here the latter does not repeal the former, but they shall both have a concurrent efficacy. If by a former law an offence be indictable at the quarter-sessions, and a later law makes the same offence indictable at the assizes; here the jurisdiction of the sessions is not taken away, but both have a concurrent jurisdiction, and the offender may be prosecuted at either: unless the new statute subjoins express negative words; as, that the offence shall be indictable at the assizes, and not elsewhere.

8. If a statute, that repeals another, is itself repealed afterwards, the first statute is hereby revived, without any formal words for that purpose. So when the statutes of 26 and 35 Hen. VIII. declaring the king to be the supreme head of the church, were repealed by a statute 1 and 2 Philip and Mary, and this latter statute was afterwards repealed by an act of 1 Eliz. there needed not any express words of revival in queen Elizabeth's statute, but these acts of king Henry were impliedly and virtually revived.

9. Acts of parliament derogatory from the power of subsequent parliaments bind not. So the statute 11 Hen. VII. c. 1. which directs, that no person for assisting a king *de facto* shall be attainted of treason by act of parliament or otherwise, is held to be good only as to common prosecutions for high treason; but will not restrain or clog any parliamentary attainder. Because the legislature, being in truth the sovereign power, is always of equal, always of absolute authority: it acknowledges no superior upon earth, which the prior legislature must have been if its ordinances could bind the present parliament. And upon the same principle Cicero, in his letters to Atticus, treats with a proper contempt these restraining clauses, which endeavour to tie up the hands of succeeding legislatures. "When you repeal the law itself, (says he,) you at the same time repeal the prohibitory clause which guards against such repeal."

10. Lastly, acts of parliament that are impossible to be performed are of no validity: and if there arise out of them collaterally any absurd consequences, manifestly contradictory to common reason, they are with regard to those collateral consequences void. We lay down the rule with these restrictions; though we know it is generally laid down more largely, that acts of parliament contrary to reason are void. But if the parliament will positively enact a thing to be done which is unreasonable, we know of no power that can control it: and the examples usually alleged in support of this sense of the rule do none of them prove, that, where the main object of a statute is unreasonable, the judges are at liberty to reject it; for that were to fetter the judicial power above that of the legislature, which would be subversive of all government. But where some collateral matter arises out of the general words, and happens to be unreasonable; there the judges are in decency to conclude that this consequence was not foreseen by the parliament, and therefore they are at liberty to expound the statute by equity, and only *quoad hoc* disregard it. Thus if an act of parliament gives a man power to try all causes that arise within his manor of Dale; yet, if a cause should arise in which he himself is party, the act is construed not to extend to that, because it is unreasonable that any man should

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determine his own quarrel. But, if we could conceive it possible for the parliament to enact, that he should try as well his own causes as those of other persons, there is no court that has power to defeat the intent of the legislature, when couched in such evident and express words as leave no doubt whether it was the intent of the legislature or no.

These are the several grounds of the laws of England: over and above which, equity is also frequently called in to assist, to moderate, and to explain them. What equity is, and how impossible in its very essence to be reduced to stated rules, hath been shewn above. It may be sufficient, therefore, to add in this place, that (besides the liberality of sentiment with which our common-law judges interpret acts of parliament, and such rules of the unwritten law as are not of a positive kind) there are also courts of equity established for the benefit of the subject, to detect latent frauds and concealments, which the process of the courts of law is not adapted to reach; to enforce the execution of such matters of trust and confidence, as are binding in conscience, though not cognizable in a court of law; to deliver from such dangers as are owing to misfortune or oversight; and to give a more specific relief, and more adapted to the circumstances of the case, than can always be obtained by the generality of the rules of the positive or common law. This is the business of the courts of equity, which however are only conversant in matters of property. For the freedom of our constitution will not permit, that in criminal cases a power should be lodged in any judge to contrive the law otherwise than according to the letter. This caution, while it admirably protects the public liberty, can never bear hard upon individuals. A man cannot suffer more punishment than the law assigns, but he may suffer less. The laws cannot be strained by partiality to inflict a penalty beyond what the letter will warrant; but, in cases where the letter induces any apparent hardship, the crown has the power to pardon.

The objects of the laws of England are, 1. The rights of persons. 2. The rights of things. 3. Private wrongs. 4. Public wrongs.

## CH A P. I.

### Of the RIGHTS of PERSONS.

#### [xlv.] SECT. I. Of the absolute rights of individuals.

(1.) THE objects of the Laws of England are, 1. Rights, 2. Wrongs.

(2.) Rights are the rights of persons, or the rights of things.

(3.) The rights of persons are such as concern, and are annexed to, the persons of men: and, when the person to whom they are due is regarded, they are called (simply) rights; but, when we consider the person from whom they are due, they are then denominated duties.

(4.) Persons are either natural, that is, such as they are formed by nature; or artificial, that is, created by human policy, as bodies politic or corporations.

(5.) The rights of natural persons are, 1. Absolute, or such as belong to individuals. 2. Relative, or such

as regard members of society.

(6.) The absolute rights of individuals, regarded by the municipal laws, (which pay no attention to duties of the absolute kind) compose what is called political or civil liberty.

(7.) Political or civil liberty is the natural liberty of mankind, so far restrained by human laws as is necessary for the good of society.

(8.) The absolute rights or civil liberties of Englishmen, as frequently declared in parliament, are principally three; the right of personal security, of personal liberty, and of private property.

(9.) The right of personal security consists in the legal enjoyment of life, limb, body, health, and reputation.

(10.) The right of personal liberty consists in the free power of loco-motion, without illegal restraint or banishment.

(11.) The right of private property consists in every man's free use and disposal of his own lawful acquisitions, without injury or illegal diminution.

(12.) Besides these three primary rights, there are others which are secondary and subordinate; viz. (to preserve the former from unlawful attacks) 1. The constitution and power of parliaments; 2. The limitation of the king's prerogative:—And (to vindicate them when actually violated) 3. The regular administration of public justice; 4. The right of petitioning for redress of grievances; 5. The right of having and using arms for self-defence.

## SECT. II. Of the parliament.

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(1.) The relations of persons are, 1. Public. 2. Private. The public relations are those of magistrates and people. Magistrates are supreme or subordinate. And of supreme magistrates, in England, the parliament is the supreme legislative, the king the supreme executive.

(2.) Parliaments, in some shape, are of as high antiquity as the Saxon government in this island; and have subsisted, in their present form, at least five hundred years.

(3.) The parliament is assembled by the king's writs, and its sitting must not be intermitted above three years.

(4.) Its constituent parts are the king's majesty, the lords spiritual and temporal, and the commons represented by their members: each of which parts has a negative, or necessary, voice in making laws.

(5.) With regard to the general law of parliament; its power is absolute: each house is the judge of its own privileges; and all the members of either house are entitled to the privilege of speech, of person, of their domestics, and of their lands and goods.

(6.) The peculiar privileges of the lords (besides their judicial capacity) are to hunt in the king's forests; to be attended by the pages of the law; to make proxies; to enter protests; and to regulate the election of the 16 peers of North-Britain.

(7.) The peculiar privileges of the commons are to frame taxes for the subject; and to determine the merits of their own elections, with regard to the qualifications of the electors and elected, and the proceedings at elections themselves.

(8.) Bills are usually twice read in each house, committed, engrossed, and then read a third time; and

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when they have obtained the concurrence of both houses, and received the royal assent, they become *acts of parliament*.

(9.) The houses may adjourn themselves; but the king only can prorogue the parliament.

(10.) Parliaments are dissolved, 1. At the king's will. 2. By the demise of the crown, that is, within six months after. 3. By length of time, or having sat for the space of seven years.

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### SECT. III. *Of the king and his title.*

(1.) THE supreme executive power of this kingdom is lodged in a single person; the king or queen.

(2.) This royal person may be considered with regard to, 1. His title. 2. His royal family. 3. His councils. 4. His duties. 5. His prerogative. 6. His revenue.

(3.) With regard to his *title*; the crown of England, by the positive constitution of the kingdom, hath ever been defendible, and so continues.

(4.) The crown is defendible in a course peculiar to itself.

(5.) This course of descent is subject to limitation by parliament.

(6.) Notwithstanding such limitations, the crown retains its defendible quality, and becomes hereditary in the prince to whom it is limited.

(7.) King Egbert, king Canute, and king William I. have been successively constituted the common stocks, or ancestors, of this descent.

(8.) At the revolution the convention of estates, or representative body of the nation, declared, that the misconduct of king James II. amounted to an abdication of the government, and that the throne was thereby *vacant*.

(9.) In consequence of this vacancy, and from a regard to the ancient line, the convention appointed the next protestant heirs of the blood royal of king Charles I. to fill the vacant throne, in the old order of succession; with a temporary exception, or preference, to the person of king William III.

(10.) On the impending failure of the protestant line of king Charles I. (whereby the throne might again have become vacant) the king and parliament extended the settlement of the crown to the protestant line of king James I. viz. to the princess Sophia of Hanover, and the heirs of her body, being Protestants: And she is now the common stock, from whom the heirs of the crown must descend.

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### SECT. IV. *Of the king's royal family.*

(1.) THE king's royal family consists, first, of the queen: who is regnant, consort, or dowager.

(2.) The queen *consort* is a public person, and hath many personal prerogatives and distinct revenues.

(3.) The prince and princess of Wales, and the princess-royal, are peculiarly regarded by the law.

(4.) The other princes of the blood-royal are only intitled to precedence.

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### SECT. V. *Of the councils belonging to the king.*

(1.) THE king's councils are, 1. The parliament. 2. The great council of peers. 3. The judges, for matters of law. 4. The privy council.

(2.) In *privy-counsellors* may be considered, 1. Their

creation. 2. Their qualifications. 3. Their duties. 4. Their powers. 5. Their privileges. 6. Their dissolution.

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### SECT. VI. *Of the king's duties.*

(1.) THE king's duties are to govern his people according to law, to execute judgment in mercy, and to maintain the established religion. These are his part of the original contract between himself and the people; founded in the nature of society, and expressed in his oath at the coronation.

### SECT. VII. *Of the king's prerogative.*

(1.) PREROGATIVE is that special power and pre-eminence, which the king hath above other persons, and out of the ordinary course of law, in right of his regal dignity.

(2.) Such prerogatives are either *direct*, or *incidental*. The *incidental*, arising out of other matters, are considered as they arise: We now treat only of the *direct*.

(3.) The *direct* prerogatives regard, 1. The king's dignity, or royal character; 2. His authority, or regal power; 3. His revenue, or royal income.

(4.) The king's dignity consists in the legal attributes of, 1. Personal sovereignty. 2. Absolute perfection. 3. Political perpetuity.

(5.) In the king's authority, or regal power, consists the executive part of government.

(6.) In *foreign* concerns; the king, as the representative of the nation, has the right or prerogative, 1. Of sending and receiving ambassadors. 2. Of making treaties. 3. Of proclaiming war or peace. 4. Of issuing reprisals. 5. Of granting safe-conducts.

(7.) In *domestic* affairs; the king is, first, a constituent part of the supreme legislative power; hath a negative upon all new laws; and is bound by no statute, unless specially named therein.

(8.) He is also considered as the general of the kingdom, and may raise fleets and armies, build forts, appoint havens, erect beacons, prohibit the exportation of arms and ammunition, and confine his subjects within the realm, or recall them from foreign parts.

(9.) The king is also the fountain of justice, and general conservator of the peace; and therefore may erect courts (wherein he hath a legal ubiquity) prosecute offenders, pardon crimes, and issue proclamations.

(10.) He is likewise the fountain of honour, of office, and of privilege.

(11.) He is also the arbiter of *domestic* commerce; (not of *foreign*, which is regulated by the law of merchants); and is therefore entitled to the erection of public marts, the regulation of weights and measures; and the coinage or legitimation of money.

(12.) The king is, lastly, the supreme head of the church; and, as such, convenes, regulates and dissolves synods, nominates bishops, and receives appeals in all ecclesiastical causes.

### SECT. VIII. *Of the king's revenue.*

(1.) THE king's revenue is either *ordinary* or *extraordinary*. And the ordinary is, 1. Ecclesiastical. 2. Temporal.

(2.) THE king's ecclesiastical revenue consists in, 1. The custody of the temporalities of vacant bishopricks.

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rick. 2. Corodies and pensions. 3. Extra-parochial tithes. 4. The first fruits and tenths of benefices.

(3.) The *king's* ordinary *temporal* revenue consists in, 1. The demesne lands of the crown. 2. The hereditary excise; being part of the consideration for the purchase of his feudal profits, and the prerogatives of purveyance and pre-emption. 3. An annual sum issuing from the duty on wine licences; being the residue of the same consideration. 4. His forests. 5. His courts of justice. 6. Royal fish. 7. Wrecks, and things jet-sam, flotam, and ligan. 8. Royal mines. 9. Treasure trove. 10. Waifs. 11. Eitrays. 12. Forfeitures for offences, and deadlands. 13. Escheats of lands. 14. Custody of idiots and lunatics.

(4.) The *king's* extraordinary revenue consists in aids, subsidies, and supplies, granted him by the commons in parliament.

(5.) Heretofore these were usually raised by grants of the (nominal) *tenth* or *fifteenth* part of the moveables in every township; or by scutages, hydages, and tallages; which were succeeded by *subsidies* assessed upon individuals, with respect to their lands and goods.

(6.) A new system of taxation took place about the time of the revolution: our modern taxes are therefore, 1. *Annual*. 2. *Perpetual*.

(7.) The *annual taxes* are, 1. The land-tax, or the ancient subsidy raised upon a new assessment. 2. The malt-tax, being an annual excise on malt, mum, cyder, and perry.

(8.) The *perpetual taxes* are, 1. The customs, or tonnage and poundage of all merchandise exported or imported. 2. The excise-duty, or inland imposition on a great variety of commodities. 3. The salt-duty, or excise on salt. 4. The post-office, or duty for the carriage of letters. 5. The stamp-duty on paper, parchment, &c. 6. The duty on houses and windows. 7. The duty on licences for hackney coaches and chairs. 8. The duty on offices and pensions.

(9.) Part of this revenue is applied to pay the interest of the national debt, till the principal is discharged by parliament.

(10.) The produce of these several taxes were originally separate and *specific funds*, to answer *specific loans* upon their respective credits; but are now consolidated by parliament into three principal funds, the *aggregate, general, and South-sea funds*, to answer all the debts of the nation: the public faith being also superadded, to supply deficiencies, and strengthen the security of the whole.

(11.) The surpluses of these funds, after paying the interest of the national debt, are carried together, and denominated the *sinking fund*: which, unless otherwise appropriated by parliament, is annually to be applied towards paying off some part of the principal.

(12.) But, previous to this, the *aggregate fund* is now charged with an annual sum for the *civil list*; which is the immediate proper revenue of the crown, settled by parliament on the king at his accession, for defraying the charges of civil government.

### SECT. IX. Of subordinate magistrates.

(1.) SUBORDINATE magistrates, of the most general use and authority, are, 1. *Sheriffs*. 2. *Coroners*. 3. *Justices of the Peace*. 4. *Constables*. 5. *Surveyors*

of the *highways*. 6. *Overseers of the poor*.

(2.) The *sheriff* is the keeper of each county, annually nominated in due form by the king; and is (within his county) a judge, a conservator of the peace, a ministerial officer, and the king's bailiff.

(3.) *Coroners* are permanent officers of the crown in each county, elected by the freeholders; whose office it is to make enquiry concerning the death of the king's subjects, and certain revenues of the crown; and also, in particular cases, to supply the office of sheriff.

(4.) *Justices of the peace* are magistrates in each county, fitably qualified, and commissioned by the king's majesty: with authority to conserve the peace; to hear and determine felonies, and other misdemeanours; and to do many other acts, committed to their charge by particular statutes.

(5.) *Constables* are officers of hundreds and townships, appointed at the leet, and empowered to preserve the peace, to keep watch and ward, and to apprehend offenders.

(6.) *Surveyors of the highways* are officers appointed annually in every parish; to remove annoyances in, and to direct the reparation of, the public roads.

(7.) *Overseers of the poor* are officers appointed annually in every parish; to relieve such impotent, and employ such sturdy poor, as are *settled* in each parish,—by birth,—by parentage,—by marriage,—or by forty days residence; accompanied with, 1. Notice. 2. Renting a tenement of ten pounds annual value. 3. Paying their assessed taxations. 4. Serving an annual office. 5. Hiring and service for a year. 6. Apprenticeship for seven years. 7. Having a sufficient estate in the parish.

### SECT. X. Of the people, whether aliens, denizens, or natives.

(1.) THE people are either *aliens*, that is, born out of the dominions, or allegiance, of the crown of Great Britain; or *natives*, that is, born within it.

(2.) Allegiance is the duty of all subjects; being the reciprocal tie of the people to the prince, in return for the protection he affords them; and, in *natives*, this duty of allegiance is natural and perpetual; in *aliens*, is local and temporary only.

(3.) The rights of *natives* are also natural and perpetual: those of *aliens*, local and temporary only; unless they be made denizens by the king, or naturalized by parliament.

### SECT. XI. Of the clergy.

(1.) THE people, whether aliens, denizens, or natives, are also either *clergy*, that is, all persons in holy orders, or in ecclesiastical offices; or *laity*, which comprehends the rest of the nation.

(2.) The *clerical* part of the nation, thus defined, are, 1. Archbishops and bishops; who are elected by their several chapters, at the nomination of the crown, and afterwards confirmed and consecrated by each other. 2. Deans and chapters. 3. Arch-deacons. 4. Rural deans. 5. Parsons (under which are included appropriators), and vicars; to whom there are generally requisite, holy orders, presentation, institution, and induction. 6. Curates. To which may be added, 7. Churchwardens. 8. Parish-clerks and sextons.

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SECT. XII. *Of the civil state.*

(1.) THE *laity* are divisible into three states; *civil*, *military*, and *maritime*.

(2.) The *civil* state (which includes all the nation, except the clergy, the army, and the navy; and many individuals among them also,) may be divided into the *nobility*, and the *commonalty*.

(3.) The *nobility* are dukes, marquises, earls, viscounts, and barons. These had anciently duties annexed to their respective honours: they are created either by writ, that is, by summons to parliament; or by the king's letters-patent, that is, by royal grant: and they enjoy many privileges, exclusive of their senatorial capacity.

(4.) The *commonalty* consist of, knights of the garter, knights bannerets, baronets, knights of the bath, knights bachelors, esquires, gentlemen, yeomen, tradesmen, artificers, and labourers.

iv. SECT. XIII. *Of the military and maritime states.*

(1.) THE *military* state, by the standing constitutional law, consists of the militia of each county, raised from among the people by lot, officered by the principal landholders, and commanded by the lord lieutenant.

(2.) The more disciplined occasional troops of the kingdom are kept on foot only from year to year, by parliament; and, during that period, are governed by martial law, or arbitrary articles of war, formed at the pleasure of the crown.

(3.) The *maritime* state consists of the officers and mariners of the British navy; who are governed by express and permanent laws, or the articles of the navy, established by act of parliament.

lvii. SECT. XIV. *Of master and servant.*

(1.) THE *private*, economical, relations of persons are those of, 1. *Master and servant*. 2. *Husband and wife*. 3. *Parent and child*. 4. *Guardian and ward*.

(2.) The first relation may subsist between a *master* and four species of *servants*; (for slavery is unknown to our laws): *viz.* 1. *Menial servants*; who are *hired*. 2. *Apprentices*; who are *bound* by indentures. 3. *Labourers*; who are *casually employed*. 4. *Stewards, bailiffs, and factors*; who are *rather in a ministerial* state.

(3.) From this relation result diverse powers to the master, and emoluments to the servant.

(4.) The master hath a property in the service of his servant; and must be answerable for such acts as the servant does by his express, or implied, command.

lviii. SECT. XV. *Of husband and wife.*

(1.) THE second private relation is that of *marriage*; which includes the reciprocal rights and duties of *husband and wife*.

(2.) *Marriage* is duly contracted between persons, 1. *Consenting*. 2. *Free* from canonical impediments, which make it *voidable*: 3. *Free* also from the civil impediments,—of prior marriage;—of want of age;—of non-consent of parents or guardians, where requisite;—and of want of reason; either of which make it *totally void*. And it must be celebrated by a clergyman, in due form and place.

(3.) *Marriage* is dissolved, 1. *By death*. 2. *By di-*

vorce in the spiritual court; not a *nuptia et thoro* only, but a *vinculo matrimonii*, for canonical cause existing previous to the contract. 3. *By act of parliament*, as for adultery.

(4.) By marriage the husband and wife become one person in law; which unity is the principal foundation of their respective rights, duties, and disabilities.

SECT. XVI. *Of parent and child.*

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(1.) THE third, and most universal, private relation is that of *parent and child*.

(2.) *Children* are, 1. *Legitimate*; being those who are born in lawful wedlock, or within a competent time after. 2. *Bastards*, being those who are not so.

(3.) The duties of parents to *legitimate* children are, 1. *Maintenance*. 2. *Protection*. 3. *Education*.

(4.) The power of parents consists principally in correction, and consent to marriage. Both may after death be delegated by will to a guardian; and the former also, living the parent, to a tutor or master.

(5.) The duties of *legitimate* children to parents are obedience, protection, and maintenance.

(6.) The duty of parents to *bastards* is only that of maintenance.

(7.) The rights of a *bastard* are such only as he can acquire; for he is incapable of inheriting any thing.

SECT. XVII. *Of guardian and ward.*

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(1.) THE fourth private relation is that of *guardian and ward*, which is plainly derived from the last; these being, during the continuance of their relation, reciprocally subject to the same rights and duties.

(2.) *Guardians* are of divers sorts: 1. *Guardians by nature*, or the parents. 2. *Guardians for nurture*, assigned by the ecclesiastical courts. 3. *Guardians in socage*, assigned by the common law. 4. *Guardians by statute*, assigned by the father's will. All subject to the superintendence of the court of chancery.

(3.) *Full age* in male or female for all purposes is the age of 21 years, (different ages being allowed for different purposes;) till which age the person is an *infant*.

(4.) An *infant*, in respect of his tender years, hath various privileges, and various disabilities, in law; chiefly with regard to suits, crimes, estates, and contracts.

SECT. XVIII. *Of corporations.*

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(1.) *Bodies politic*, or *corporations*, which are *artificial* persons, are established for preserving in perpetual succession certain rights; which, being conferred on *natural* persons only, would fail in process of time.

(2.) *Corporations* are, 1. *Aggregate*, consisting of many members. 2. *Sole*, consisting of one person only.

(3.) *Corporations* are also either *spiritual*, erected to perpetuate the rights of the church; or *lay*. And the lay are, 1. *Civil*; erected for many temporal purposes. 2. *Eleemosynary*; erected to perpetuate the charity of the founder.

(4.) *Corporations* are usually erected, and named, by virtue of the king's royal charter; but may be created by act of parliament.

(5.) The powers incident to all corporations are, 1. *To maintain perpetual succession*. 2. *To act* in their corporate capacity like an individual. 3. *To hold lands*, subject

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subject to the statutes of mortmain. 4. To have a common feal. 5. To make by laws. Which last power, in spiritual or eleemosynary corporations, may be executed by the king or the founder.

(6.) The duty of corporations is to answer the ends of their institution.

(7.) To enforce this duty, all corporations may be visited: spiritual corporations by the ordinary; lay corporations by the founder, or his representatives; viz. the civil by the king (who is the *fundator incipiens* of all) represented in his court of king's bench; the eleemosynary by the endower, (who is the *fundator perficiens* of such), or by his heirs or assigns.

(8.) Corporations may be dissolved, 1. By act of parliament. 2. By the natural death of all their members. 3. By surrender of their franchises. 4. By forfeiture of their charter.

## CHAP. II.

### Of the RIGHTS of THINGS.

#### SECT. I. Of Property in general.

(1.) ALL dominion over external objects has its original from the gift of the Creator to man in general.

(2.) The substance of things was, at first, common to all mankind; yet a temporary property, in the use of them, might even then be acquired, and continued, by occupancy.

(3.) In process of time a permanent property was established in the substance, as well as the use, of things; which was also originally acquired by occupancy only.

(4.) Left this property should determine by the owner's dereliction or death, whereby the thing would again become common, societies have established conveyances, wills, and heirships, in order to continue the property of the first occupant: and, where by accident such property becomes discontinued or unknown, the thing usually reverts to the sovereign of the state, by virtue of the municipal law.

(5.) But of some things, which are incapable of permanent substantial dominion, there still subsists only the same transient usufructuary property, which originally subsisted in all things.

#### SECT. II. Of real property; and, first, of corporeal hereditaments.

(1.) In this property, or exclusive dominion, consist the rights of things; which are, 1. Things real. 2. Things personal.

(2.) In things real may be considered, 1. Their several kinds. 2. The tenures, by which they may be holden. 3. The estates which may be acquired therein. 4. Their title, or the means of acquiring and losing them.

(3.) All the several kinds of things real are reducible to one of these three, viz. lands, tenements, or hereditaments; whereof the second includes the first, and the third includes the first and second.

(4.) Hereditaments therefore, or whatever may come to be inherited, (being the most comprehensive denomination of things real,) are either corporeal or incorporeal.

(5.) Corporeal hereditaments consist wholly of lands, in their largest legal sense; wherein they include not only the face of the earth, but every other object of sense adjoining thereto, and subsisting either above or beneath it.

#### SECT. III. Of incorporeal hereditaments.

(1.) INCORPOREAL hereditaments are rights issuing out of things corporeal, or concerning, or annexed to, or exercisable within, the same.

(2.) Incorporeal hereditaments are, 1. Advowsons. 2. Tithes. 3. Commons. 4. Ways. 5. Offices. 6. Dignities. 7. Franchises. 8. Corodies or pensions. 9. Annuities. 10. Rents.

(3.) An advowson is a right of presentation to an ecclesiastical benefice; either appendant, or in gross. This may be, 1. Presentative. 2. Collative. 3. Donative.

(4.) Tithes are the tenth part of the increase yearly arising from the profits and stock of lands, and the personal industry of mankind. These, by the ancient and positive law of the land, are due of common right to the parson, or (by endowment) to the vicar; unless specially discharged, 1. By real composition. 2. By Prescription, either *de modo decimandi*, or *de non decimando*.

(5.) Common is a profit which a man hath in the lands of another; being, 1. Common of pasture; which is either appendant, appurtenant, because of vicinage, or in gross. 2. Common of piscary. 3. Common of turbary. 4. Common of clovers, or botes.

(6.) Ways are a right of passing over another man's ground.

(7.) Offices are the right to exercise a public or private employment.

(8.) For dignities, which are titles of honour, see Chap. I. Sect. 12.

(9.) Franchises are a royal privilege, or branch of the king's prerogative, subsisting in the hands of a subject.

(10.) Corodies are allotments for one's sustenance; which may be converted into pensions. (See Chap. I. Sect. 8.)

(11.) An annuity is a yearly sum of money, charged upon the person, and not upon the lands of the grantor.

(12.) Rents are a certain profit issuing yearly out of lands and tenements; and are reducible to, 1. Rent-service. 2. Rent-charge. 3. Rent-secck.

#### SECT. IV. Of the Feodal System.

(1.) The doctrine of tenures is derived from the feodal law; which was planted in Europe by its northern conquerors at the dissolution of the Roman empire.

(2.) Pure and proper feuds were parcels of land allotted by a chief to his followers, to be held on the condition of personally rendering due military service to their lord.

(3.) These were granted by investiture; were held under the bond of fealty; were inheritable only by descendants; and could not be transferred without the mutual consent of the lord and vassal.

(4.) Improper feuds were derived from the other; but

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but differed from them in their original, their services and renders, their descent, and other circumstances.

(5.) The lands of England were converted into *feuds*, of the improper kind, soon after the Norman conquest: which gave rise to the grand maxim of tenure, viz. That all lands in the kingdom are *holden*, mediately or immediately, of the king.

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#### SECT. V. Of the ancient English tenures.

(1.) THE distinction of tenures consisted in the nature of their services: as, 1. *Chivalry*, or *knight-service*; where the service was free, but uncertain. 2. *Free socage*; where the service was free, and certain. 3. *Pure villenage*; where the service was base, and uncertain. 4. *Privileged villenage*, or *villain socage*; where the service was base, but certain.

(2.) The most universal ancient tenure was that in *chivalry*, or by *knight-service*; in which the tenant of every knight's fee was bound, if called upon, to attend his lord to the wars. This was granted by livery, and perfected by homage and fealty; which usually drew after them suit of court.

(3.) The other fruits and consequences of the tenure by knight-service were, 1. Aid. 2. Relief. 3. Primer seisin. 4. Wardship. 5. Marriage. 6. Fines upon alienation. 7. Escheat.

(4.) *Grand serjeanty* differed from *chivalry* principally in its render, or service; and not in its fruits and consequences.

(5.) The personal service in *chivalry* was at length gradually changed into pecuniary assessments, which were called *scutage* or *escuage*.

(6.) These military tenures (except the services of grand serjeanty) were, at the restoration of King Charles, totally abolished, and reduced to free socage by act of parliament.

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#### SECT. VI. Of the modern English tenures.

(1.) *FREE socage* is a tenure by any free, certain, and determinate service.

(2.) This tenure, the relic of Saxon liberty, includes *petit serjeanty*, tenure in *burgage*, and *gavelkind*.

(3.) Free socage lands partake strongly of the feudal nature, as well as those in *chivalry*: being holden; subject to some service, at the least to fealty and suit of court; subject to relief, to wardship, and to escheat, but not to marriage; subject also formerly to aids, primer seisin, and fines for alienation.

(4.) *Pure villenage* was a precarious and slavish tenure, at the absolute will of the lord, upon uncertain services of the basest nature.

(5.) From hence, by tacit consent or encroachment, have arisen the modern *copholds*, or tenure by copy of court-roll; in which lands may be still held at the (nominal) will of the lord, (but regulated) according to the custom of the manor.

(6.) These are subject, like socage lands, to services, relief, and escheat; and also to heriots, wardship, and fines upon descent and alienation.

(7.) *Privileged villenage*, or *villain socage*, is an exalted species of copyhold tenure, upon base, but certain, services; subsisting only in the ancient demesnes of the crown; whence the tenure is denominated the tenure in *ancient demesne*.

(8.) These copyholds of ancient demesne have di-

vers immunities annexed to their tenure; but are still held by copy of court-roll, according to the custom of the manor, though not at the will of the lord.

(9.) *Frankalmoin* is a tenure by spiritual services at large, whereby many ecclesiastical and eleemosynary corporations now hold their lands and tenements; being of a nature distinct from tenure by divine service in certain.

#### SECT. VII. Of freehold estates of inheritance.

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(1.) ESTATES in lands, tenements, and hereditaments, are such interest as the tenant hath therein; to ascertain which, may be considered, 1. The quantity of interest. 2. The time of enjoyment. 3. The number and connexions of the tenants.

(2.) Estates, with respect to their quantity of interest, or duration, are either *freehold*, or *less than freehold*.

(3.) A *freehold* estate, in lands, is such as is created by livery of seisin at common law; or, in tenements of an incorporeal nature, by what is equivalent thereto.

(4.) Freehold estates are either estates of inheritance, or not of inheritance, viz. for life only: and inheritances are, 1. *Absolute*, or *fee simple*. 2. *Limited fees*.

(5.) Tenant in *fee simple* is he that hath lands, tenements, or hereditaments, to hold to him and his heirs for ever.

(6.) *Limited fees* are, 1. *Qualified*, or *base*, fees. 2. *Fees conditional* at the common law.

(7.) *Qualified or base fees* are those which, having a qualification subjoined thereto, are liable to be defeated when that qualification is at an end.

(8.) *Conditional fees*, at the common law, were such as were granted to the donee, and the heirs of his body, in exclusion of collateral heirs.

(9.) These were held to be fees, granted on condition that the donee had issue of his body; which condition being once performed by the birth of issue, the donee might immediately alienate the land: but, the statute *de donis* being made to prevent such alienation, thereupon from the division of the fee (by construction of this statute) into a particular estate and a reversion, the conditional fees began to be called *fee-tail*.

(10.) All tenements real, or favouring of the realty, are subject to entails.

(11.) Estates tail may be, 1. general, or special; 2. male, or female; 3. given in frank marriage.

(12.) Incident to estates tail are, 1. Waste. 2. Dower. 3. Courtesy. 4. Bar;—by fine, recovery, or lineal warranty with affects.

(13.) Estates tail are now, by many statutes and resolutions of the courts, almost brought back to the state of conditional fees at the common law.

#### SECT. VIII. Of freeholds, not of inheritance.

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(1.) *FREEHOLDS*, not of inheritance, or for life only, are, 1. *Conventional*, or created by the act of the parties. 2. *Legal*, or created by operation of law.

(2.) *Conventional* estates for life are created by an express grant for term of one's own life, or *pur autre vie*; or by a general grant, without expressing any term at all.

(3.) Incident to this, and all other estates for life, are cloggers, and emblements: and to estates *pur autre vie*.



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*vie* general occupancy was also incident; as special occupancy still is, if *cestuy que vie* survives the tenant.

(4.) *Legal estates for life* are, 1. Tenancy in *tail*, after *possibility* of issue *extinct*. 2. Tenancy by the *curtesy* of England. 3. Tenancy in *dower*.

(5.) Tenancy in *tail*, after *possibility* of issue *extinct*, is where an estate is given in special *tail*; and, before issue had, a person dies from whose body the issue was to spring; whereupon the tenant (if surviving) becomes tenant in *tail*, after *possibility* of issue *extinct*.

(6.) This estate partakes both of the incidents to an estate *tail*, and those of an estate for life.

(7.) Tenancy by the *curtesy* of England is where a man's wife is seized of an estate of inheritance; and he by her has issue, born alive, which was capable of inheriting her estate; in which case he shall, upon her death, hold the tenements for his own life, as tenant by the *curtesy*.

(8.) Tenancy in *dower* is where a woman's husband is seized of an estate of inheritance, of which her issue might by any possibility have been heir; and the husband dies: the woman is hereupon entitled to *dower*, or one third part of the lands and tenements, to hold for her natural life.

(9.) *Dower* is either by the common law; by special custom; *ad osium ecclesie*; or, *ex assensu patris*.

(10.) *Dower* may be forfeited or barred, particularly by an estate in *jointure*.

#### SECT. IX. Of estates less than freehold.

(1.) *ESTATES less than freehold* are, 1. *Estates for years*. 2. *Estates at will*. 3. *Estates at sufferance*.

(2.) An estate for *years* is where a man, seized of lands and tenements, letteth them to another for a certain period of time, which transfers the interest of the term; and the lessee enters thereon, which gives him possession of the term, but not legal seisin of the land.

(3.) Incident to this estate are covenants; and also emblements, if it determines before the full end of the term.

(4.) An estate at *will* is where lands are let by one man to another, to hold at the will of both parties; and the lessee enters thereon.

(5.) *Copholds* are estates held at the will of the lord, (regulated) according to the custom of the manor.

(6.) An estate at *sufferance* is where one comes into possession of land by lawful title, but keeps it afterwards without any title at all.

#### SECT. X. Of estates upon condition.

(1.) *ESTATES* (whether freehold or otherwise) may also be held upon *condition*; in which case their existence depends on the happening, or not happening, of some uncertain event.

(2.) These estates are, 1. On condition *implied*. 2. On condition *expressed*. 3. Estates in *gage*. 4. Estates by *statute*, merchant or staple. 5. Estates by *eligit*.

(3.) Estates on condition *implied* are where a grant of an estate has, from its essence and constitution, a condition inseparably annexed to it; though none be expressed in words.

(4.) Estates on condition *expressed* are where an express qualification or provision is annexed to the grant

of an estate.

(5.) On the performance of these conditions either expressed or implied (if *precedent*) the estate may be vested or enlarged; or, on the breach of them (if *subsequent*) an estate already vested may be defeated.

(6.) Estates in *gage*, in *vadio*, or in pledge, are estates granted as a security for money lent; being 1. *In vivo vadio*, or *living gage*; where the profits of land are granted till a debt be paid, upon which payment the grantor's estate will revive. 2. *In mortuo vadio*, in *dead*, or *mort gage*; where an estate is granted, on condition to be void at a day certain, if the grantor then repays the money borrowed; on failure of which, the estate becomes absolutely dead to the grantor.

(7.) Estates by *statute-merchant*, or *statute-staple*, are also estates conveyed to creditors, in pursuance of certain statutes, till their profits shall discharge the debt.

(8.) Estates by *eligit* are where, in consequence of a judicial writ so called, lands are delivered by the sheriff to a plaintiff, till their profits shall satisfy a debt adjudged to be due by law.

#### SECT. XI. Of estates in possession, remainder, and reversion.

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(1.) *ESTATES*, with respect to their time of enjoyment, are either in immediate *possession*, or in *expectancy*; which estates in *expectancy* are created at the same time, and are parcel of the same estates, as those upon which they are expectant. These are, 1. *Remainders*. 2. *Reversions*.

(2.) A *remainder* is an estate limited to take effect, and be enjoyed, after another *particular* estate is determined.

(3.) Therefore, 1. There must be a precedent particular estate, in order to support a remainder. 2. The remainder must pass out of the grantor, at the creation of the particular estate. 3. The remainder must vest in the grantee, during the continuance, or at the determination, of the particular estate.

(4.) *Remainders* are, 1. Vested; where the estate is fixed to remain to a certain person, after the particular estate is spent. 2. Contingent; where the estate is limited to take effect, either to an uncertain person, or upon an uncertain event.

(5.) An *executory devise* is such a disposition of lands, by will, that an estate shall not vest thereby at the death of the deviser, but only upon some future contingency, and without any precedent particular estate to support it.

(6.) A *reversion* is the residue of an estate left in the grantor, to commence in possession after the determination of some particular estate granted: to which are incident fealty, and rent.

(7.) Where two estates, the one less, the other greater, the one in possession, the other in expectancy, meet together in one and the same person, and in one and the same right, the less is merged in the greater.

#### SECT. XII. Of estates, in severalty, joint tenancy, coparcenary, and common.

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(1.) *ESTATES*, with respect to the number and connections of their tenants, may be held, 1. In *severalty*.

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ty. 2. In joint-tenancy. 3. In coparcenary. 4. In common.

(2.) An estate in *severalty* is where one tenant holds it in his own sole right, without any other person being joined with him.

(3.) An estate in *joint-tenancy* is where an estate is granted to two or more persons; in which case the law construes them to be *joint-tenants*, unless the words of the grant expressly exclude such construction.

(4.) Joint-tenancy has a unity of interest, of title, of time, and of possession: they are seized *per my & per tout*: and therefore upon the decease of one joint-tenant, the whole interest remains to the survivor.

(5.) Joint-tenancy may be dissolved, by destroying one of its four constituent unities.

(6.) An estate in *coparcenary* is where an estate of inheritance descends from the ancestor to two or more persons; who are called *parceners*, and all together make but one heir.

(7.) Parceners have an unity of interest, title, and possession; but are only seized *per my*, and not *per tout*: wherefore there is no survivorship among parceners.

(8.) Incident to this estate is the law of *hotchpot*.

(9.) Coparcenary may also be dissolved, by destroying any of its three constituent unities.

(10.) An estate in *common* is where two or more persons hold lands, possibly by distinct titles, and for distinct interests; but by unity of possession, because none knoweth his own severalty.

(11.) Tenants in common have therefore an unity of possession, (without survivorship; being seized *per my*, and not *per tout*;) but no necessary unity of title, time, or interest.

(12.) This estate may be created, 1. By dissolving the constituent unities of the two former; 2. By express limitation in a grant: and may be destroyed, 1. By uniting the several titles in one tenant; 2. By partition of the land.

### lxxv. SECT. XIII. *Of the title to things real, in general.*

(1.) A title to things real is the means whereby a man cometh to the just possession of his property.

(2.) Herein may be considered, 1. A mere or naked possession. 2. The right of possession; which is, *is*, an apparent, *adly*, an actual, right. 3. The mere right of property. 4. The conjunction of actual possession with both these rights; which constitutes a perfect title.

### lxxvi. SECT. XIV. *Of title by descent.*

(1.) THE title to things real may be reciprocally acquired or lost, 1. By descent. 2. By purchase.

(2.) Descent is the means whereby a man, on the death of his ancestor, acquires a title to his estate, in right of representation, as his heir at law.

(3.) To understand the doctrine of descents, we must form a clear notion of *consanguinity*; which is the connexion, or relation, of persons descended from the same stock or common ancestor; and it is, 1. *Lineal*, where one of the kinsmen is lineally descended from the other. 2. *Collateral*, where they are lineally descended, not one from the other, but both from the same common ancestor.

(4.) The rules of descent, or *canons of inheritance*, observed by the laws of England, are these:

1<sup>st</sup>, Inheritances shall lineally descend to the issue of the person last actually seized, *in infinitum*; but shall never lineally ascend.

2<sup>d</sup>, The male issue shall be admitted before the female.

3<sup>d</sup>, Where there are two or more males in equal degree, the eldest only shall inherit; but the females all together.

4<sup>th</sup>, The lineal descendants, *in infinitum*, of any person deceased shall represent their ancestor; that is, shall stand in the same place as the person himself would have done, had he been living.

5<sup>th</sup>, On failure of lineal descendants, or issue, of the person last seized, the inheritance shall descend to the blood of the first purchaser; subject to the three preceding rules. To evidence which blood, the two following rules are established.

6<sup>th</sup>, The collateral heir of the person last seized must be his next collateral kinsman, of the whole blood.

7<sup>th</sup>, In collateral inheritances, the male stocks shall be preferred to the female; that is, kindred derived from the blood of the male ancestors shall be admitted before those from the blood of the female: unless where the lands have, in fact, descended from a female.

### SECT. XV. *Of title by purchase, and first by escheat.*

(1.) PURCHASE, or perquisition, is the possession of an estate which a man hath by his own act or agreement; and not by the mere act of law, or descent from any of his ancestors. This includes, 1. *Escheat*. 2. *Occupancy*. 3. *Prescription*. 4. *Forfeiture*. 5. *Alienation*.

(2.) *Escheat* is where, upon deficiency of the tenant's inheritable blood, the estate falls to the lord of the fee.

(3.) *Inheritable blood* is wanting to, 1. Such as are not related to the person last seized. 2. His maternal relations in paternal inheritances, and *vice versa*. 3. His kindred of the half blood. 4. Monsters. 5. Bastards. 6. Aliens, and their issue. 7. Persons attainted of treason or felony. 8. Papists, in respect of themselves only, by the statute law.

### SECT. XVI. *Of title by occupancy.*

(1.) OCCUPANCY is the taking possession of those things which before had no owner.

(2.) Thus, at the common law, where tenant *pur auter vie* died during the life of *cestuy que vie*, he, who could first enter, might lawfully retain the possession; unless by the original grant the heir was made a special occupant.

(3.) The law of *derelictions* and *alluvions* has narrowed the title by occupancy.

### SECT. XVII. *Of title by prescription.*

(1.) PRESCRIPTION (as distinguished from *custom*) is a personal immemorial usage of enjoying a right in some incorporeal hereditament, by a man, and either his ancestors or those whose estate of inheritance he hath: of which the first is called *prescribing in his ancestors*, the latter in a *que estate*.

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SECT. XVIII. *Of title by forfeiture.*

(1.) FORFEITURE is a punishment annexed by law to some illegal act, or negligence, in the owner of things real; whereby the estate is transferred to another, who is usually the party injured.

(2.) Forfeitures are occasioned, 1. By crimes. 2. By alienation, contrary to law. 3. By *lapse*. 4. By *simony*. 5. By nonperformance of conditions. 6. By *waste*. 7. By breach of copyhold customs. 8. By bankruptcy.

(3.) Forfeitures for crimes, or misdemeanours, are for, 1. Treason. 2. Felony. 3. Misdemeanour of treason. 4. *Præmunire*. 5. Assaults on a judge, and batteries, sitting the courts. 6. Popish recusancy, &c.

(4.) Alienations, or conveyances, which induce a forfeiture, are, 1. Those in mortmain, made to corporations contrary to the statute law. 2. Those made to aliens. 3. Those made by particular tenants, when larger than their estates will warrant.

(5.) *Lapse* is a forfeiture of the right of presentation to a vacant church, by neglect of the patron to present within six calendar months.

(6.) *Simony* is the corrupt presentation of any one to an ecclesiastical benefice, whereby that turn becomes forfeited to the crown.

(7.) For forfeiture by nonperformance of conditions, see Sect. 10.

(8.) *Waste* is a spoil, or destruction, in any corporeal hereditaments, to the prejudice of him that hath the inheritance.

(9.) Copyhold estates may have also other peculiar causes of forfeiture, according to the custom of the manor.

(10.) Bankruptcy is the act of becoming a bankrupt; that is, a trader who secretes himself, or does certain other acts tending to defraud his creditors, (See Sect. 22.)

(11.) By bankruptcy all the estates of the bankrupt are transferred to the assignees of his commissioners, to be sold for the benefit of his creditors.

SECT. XIX. *Of title by alienation.*

(1.) ALIENATION, conveyance, or purchase in its more limited sense, is a means of transferring real estates, wherein they are voluntarily resigned by one man, and accepted by another.

(2.) This formerly could not be done by a tenant, without licence from his lord; nor by a lord, without attornment of his tenant.

(3.) All persons are capable of purchasing; and all that are in possession of any estates, are capable of conveying them; unless under peculiar disabilities by law; as being attainted, non compos, infants, under dures, feme-coverts, aliens, or papists.

(4.) Alienations are made by common assurances; which are, 1. By deed, or matter in pais. 2. By matter of record. 3. By special custom. 4. By devise.

SECT. XX. *Of alienation by deed.*

(1.) In assurances by deed may be considered, 1. Its general nature. 2. Its several species.

(2.) A deed, in general, is the solemn act of the parties; being, usually, a writing sealed and delivered; and it may be, 1. A deed indented, or indenture. 2. A

deed-poll.

(3.) The requisites of a deed are, 1. Sufficient parties, and proper subject-matter. 2. A good and sufficient consideration. 3. Writing on paper, or parchment, duly stamped. 4. Legal and orderly parts: (which are usually, 1st, the premises; 2dly, the habendum; 3dly, the tenendum; 4thly, the reddendum; 5thly, the conditions; 6thly, the warranty, which is either lineal or collateral; 7thly, the covenants; 8thly, the conclusion, which includes the date.) 5. Reading it, if desired. 6. Sealing, and, in many cases, signing it also. 7. Delivery. 8. Attestation.

(4.) A deed may be avoided, 1. By the want of any of the requisites before-mentioned. 2. By subsequent matter; as, 1st, Rature, or alteration. 2dly, Defacing its seal. 3dly, Cancelling it. 4thly, Disagreement of those whose consent is necessary. 5thly, Judgment of a court of justice.

(5.) Of the several species of deeds, some serve to convey real property, some only to charge and discharge it.

(6.) Deeds which serve to convey real property, or conveyances, are either by common law, or by statute. And, of conveyances by common law, some are original or primary, others derivative or secondary.

(7.) Original conveyances are, 1. Feoffments. 2. Gifts. 3. Grants. 4. Leases. 5. Exchanges. 6. Partitions. Derivative are, 7. Releases. 8. Confirmations. 9. Surrenders. 10. Assignments. 11. Descentances.

(8.) A feoffment is the transfer of any corporeal hereditament to another, perfected by livery of seisin, or delivery of bodily possession from the feoffor to the feoffee; without which no freehold estate therein can be created at common law.

(9.) A gift is properly the conveyance of lands in tail.

(10.) A grant is the regular method, by common law, of conveying incorporeal hereditaments.

(11.) A lease is the demise, granting, or letting to farm of any tenement, usually for a less term than the lessor hath therein; yet sometimes possibly for a greater; according to the regulations of the restraining and enabling statutes.

(12.) An exchange is the mutual conveyance of equal interests, the one in consideration of the other.

(13.) A partition is the division of an estate held in joint-tenancy, in coparcenary, or in common, between the respective tenants; so that each may hold his distinct part in severalty.

(14.) A release is the discharge or conveyance of a man's right, in lands and tenements, to another that hath some former estate in possession therein.

(15.) A confirmation is the conveyance of an estate or right in fee, whereby a voidable estate is made sure, or a particular estate is increased.

(16.) A surrender is the yielding up of an estate for life, or years, to him that hath the immediate remainder or reversion; wherein the particular estate may merge.

(17.) An assignment is the transfer, or making over to another, of the whole right one has in any estate; but usually in a lease, for life or years.

(18.) A descentance is a collateral deed, made at the same time with the original conveyance; contain-

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ing some condition, upon which the estate may be defeated.

(19.) Conveyances by *statute* depend much on the doctrine of *uses and trusts*: which are a confidence reposed in the *terre-tenant*, or tenant of the land, that he shall permit the profits to be enjoyed, according to the directions of *cestuy que use*, or *cestuy que trust*.

(20.) The statute of uses, having transferred all uses into actual possession, (or, rather, having drawn the the possession to the use), has given birth to divers other species of conveyance: 1. A *covenant* to stand seized to use. 2. A *bargain and sale*, enrolled. 3. A *lease and release*. 4. A *deed to lead or declare* the use of other more direct conveyances. 5. A *revocation of use*; being the execution of a power, reserved at the creation of the use, of recalling at a future time the use or estate so creating. All which owe their present operation principally to the statute of uses.

(21.) Deeds which do not convey, but only charge real property, and discharge it, are, 1. *Obligations*. 2. *Recognizances*. 3. *Discharges* upon both.

### xxixiii. SECT. XXI. Of alienation by matter of record.

(1.) *ASSURANCES* by matter of record are where the function of some court of record is called in, to substantiate and witness the transfer of real property. These are, 1. *Private acts of parliament*. 2. *The king's grants*. 3. *Fines*. 4. *Common recoveries*.

(2.) *Private acts of parliament* are a species of assurances, calculated to give (by the transcendent authority of parliament) such reasonable powers or relief as are beyond the reach of the ordinary course of law.

(3.) *The king's grants*, contained in charters or letters patent, are all entered on record, for the dignity of the royal person, and security of the royal revenue.

(4.) A *fine* (sometimes said to be a feoffment of record) is an amicable composition and agreement of an actual, or fictitious, suit; whereby the estate in question is acknowledged to be the right of one of the parties.

(5.) The *parts* of a fine are, 1. The writ of covenant. 2. The licence to agree. 3. The concord. 4. The note. 5. The foot. To which the statute hath added, 6. Proclamations.

(6.) Fines are of four kinds: 1. *Sur cognizance de droit, come ceo que il ad de son done*. 2. *Sur cognizance de droit tantum*. 3. *Sur concessit*. 4. *Sur done, grant, et render*; which is a double fine.

(7.) The *force and effect* of fines (when levied by such as have themselves any interest in the estate) are to assure the lands in question to the cognizee, by barring the respective rights of parties, privies, and strangers.

(8.) A *common recovery* is by an actual, or fictitious, suit or action for land, brought against the tenant of the freehold; who thereupon vouches another, who undertakes to warrant the tenant's title: but, upon such vouchee's making default, the land is recovered by judgment at law against the tenant; who, in return, obtains judgment against the vouchee to recover lands of equal value in recompense.

(9.) The *force and effect* of a recovery are to assure lands to the recoverer, by barring estates tail, and all

remainders and reversions expectant thereon; provided the tenant in tail either suffers, or is vouched in, such recovery.

(10.) The *uses* of a fine or recovery may be directed by, 1. Deeds to lead such uses; which are made previous to the levying or suffering them. 2. Deeds to declare the uses; which are made subsequent.

### SECT. XXII. Of alienation by special custom.

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(1.) *ASSURANCES* by special custom are confined to the transfer of copyhold estates.

(2.) This is elicited by, 1. *Surrender* by the tenant into the hands of the lord to the use of another, according to the custom of the manor. 2. *Presentment*, by the tenants or homage, of such surrender. 3. *Admittance* of the surrenderee by the lord, according to the uses expressed in such surrender.

(3.) *Admittance* may also be had upon original grants to the tenant from the lord, and upon descents to the heir from the ancestor.

### SECT. XXIII. Of alienation by devise.

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(1.) *DEVISE* is a disposition of lands and tenements, contained in the last will and testament of the owner.

(2.) This was not permitted by the common law, as it stood since the conquest; but was introduced by the statute law, under Henry VIII. since made more universal by the statute of tenures under Charles II. with the introduction of additional solemnities by the statute of frauds and perjuries in the same reign.

(3.) The *construction* of all common assurances should be, 1. Agreeable to the intention. 2. To the words, of the parties. 3. Made upon the entire deed. 4. Bearing strongest against the contractor. 5. Conformable to law. 6. Rejecting the latter of two totally repugnant clauses in a deed, and the former in a will. 7. Most favourable in case of a devise.

### SECT. XXIV. Of things personal.

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(1.) *THINGS personal* are comprehended under the general name of *chattels*; which includes whatever wants either the duration, or the immobility, attending things real.

(2.) In these are to be considered, 1. Their *distribution*. 2. The *property* of them. 3. The *title* to that property.

(3.) As to the *distribution* of chattels, they are, 1. *Chattels real*. 2. *Chattels personal*.

(4.) *Chattels real* are such quantities of interest, in things *immoveable*, as are short of the duration of freeholds; being limited to a time certain, beyond which they cannot subsist. (See Sect. 7.)

(5.) *Chattels personal* are things *moveable*; which may be transferred from place to place, together with the person of the owner.

### SECT. XXV. Of property in things personal.

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(1.) *PROPERTY*, in chattels personal, is either in *possession*, or in *action*.

(2.) Property in *possession*, where a man has the actual enjoyment of the thing, is, 1. *Absolute*. 2. *Qualified*.

(3.) *Absolute* property is where a man has such an exclusive right in the thing, that it cannot cease to be his, without his own act or default.

(4.) *Qualified*.

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(4.) *Qualified* property is such as is not, in its nature, permanent; but may sometimes subsist, and at other times not subsist.

(5.) This may arise, 1. Where the subject is incapable of absolute ownership. 2. From the peculiar circumstances of the owners.

(6.) Property in *action*, is where a man hath not the actual *occupation* of the thing; but only a *right* to it, arising upon some contract, and recoverable by an action at law.

(7.) The property of chattels personal is liable to remainders, expectant on estates for life; to joint-tenancy; and to tenancy in common.

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#### SECT. XXVI. *Of title to things personal by occupancy.*

(1.) *THE title* to things personal may be acquired or lost by, 1. *Occupancy*. 2. *Prerogative*. 3. *Forfeiture*. 4. *Custom*. 5. *Succession*. 6. *Marriage*. 7. *Judgment*. 8. *Gift*, or grant. 9. *Contract*. 10. *Bankruptcy*. 11. *Testament*. 12. *Administration*.

(2.) *Occupancy* still gives the first occupant a right to those few things, which have no legal owner, or which are incapable of permanent ownership. Such as, 1. Goods of alien enemies. 2. Things found. 3. The benefit of the elements. 4. Animals *feræ naturæ*. 5. Emblems. 6. Things gained by accession; or, 7. By confusion. 8. Literary property.

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#### SECT. XXVII. *Of title by prerogative, and forfeiture.*

(1.) By *prerogative* is vested in the crown, or its grantees, the property of the royal revenue; (see Chap. I. Sect. 8.) and also the property of all game in the kingdom, with the right of pursuing and taking it.

(2.) By *forfeiture*, for crimes and misdemeanours, the right of goods and chattels may be transferred from one man to another; either in part or totally.

(3.) Total forfeitures of goods arise from conviction of, 1. Treason, and misprison thereof. 2. Felony. 3. Excusable homicide. 4. Outlawry for treason or felony. 5. Flight. 6. Standing mute. 7. Assaults on a judge; and batteries, sitting the courts. 8. *Præsumere*. 9. Pretended prophecies. 10. Owling. 11. Residing abroad of artificers. 12. Challenges to fight, for debts at play.

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#### SECT. XXVIII. *Of title by custom.*

(1.) By *custom*, obtaining in particular places, a right may be acquired in chattels: the most usual of which customs are those relating to, 1. *Heriots*. 2. *Mortuaries*. 3. *Heir-looms*.

(2.) *Heriots* are either *heriot-service*, which differs little from a rent; or *heriot-custom*, which is a customary tribute, of goods and chattels, payable to the lord of the fee on the decease of the owner of lands.

(3.) *Mortuaries* are a customary gift, due to the minister in many parishes, on the death of his parishioners.

(4.) *Heir-looms* are such personal chattels, as descend by special custom to the heir, along with the inheritance of his ancestor.

#### SECT. XXIX. *Of title by succession, marriage, and judgment.*

(1.) By *succession* the right of chattels is vested in corporations aggregate; and likewise in such corporations *sole* as are the heads and representatives of bodies aggregate.

(2.) By *marriage* the chattels real and personal of the wife are vested in the husband, in the same degree of property, and with the same powers, as the wife when sole had over them; provided he reduces them to possession.

(3.) The wife also acquires, by *marriage*, a property in her *paraphernalia*.

(4.) By *judgment*, consequent on a suit at law, a man may in some cases, not only *recover*, but originally *acquire*, a right to personal property. As, 1. To penalties recoverable by action popular. 2. To damages. 3. To costs of suit.

#### SECT. XXX. *Of title by gift, grant, and contract.*

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(1.) A *gift*, or *grant*, is a voluntary conveyance of a chattel personal in possession, without any consideration or equivalent.

(2.) A *contract* is an agreement, upon sufficient consideration, to do or not to do a particular thing: and, by such contract, any personal property (either in possession or in action) may be transferred.

(3.) Contracts may either be express or implied; either executed or executory.

(4.) *The consideration* of contracts is, 1. A good consideration. 2. A valuable consideration; which is, 1. *Do, ut des*. 2. *Facio, ut facias*. 3. *Facio, ut des*. 4. *Do, ut facias*.

(5.) The most usual *species* of personal contracts are, 1. *Sale* or *exchange*. 2. *Bailment*. 3. *Hiring* or *borrowing*. 4. *Debt*.

(6.) *Sale* or *exchange* is a transmutation of property from one man to another, in consideration of some recompense in value.

(7.) *Bailment* is the delivery of goods in trust; upon a contract, express or implied, that the trust shall be faithfully performed by the bailee.

(8.) *Hiring* or *borrowing* is a contract, whereby the possession of chattels is transferred for a particular time, on condition that the identical goods (or, sometimes, their value) be restored at the time appointed; together with (in case of *hiring*) a stipend or price for the use.

(9.) This price, being calculated to answer the hazard as well as inconvenience of lending, gives birth to the doctrine of *interest*, or *usury*, upon loans; and, consequently, to the doctrine of *bottomry* or *respondentia*, and *insurance*.

(10.) *Debt* is any contract, whereby a certain sum of money becomes due to the creditor. This is, 1. A debt of record. 2. A debt upon special contract. 3. A debt upon simple contract; which last includes paper credit, or bills of exchange, and promissory notes.

#### SECT. XXXI. *Of title by bankruptcy.*

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(1.) *BANKRUPTCY* (as defined in Sect. 18.) is the  
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act of becoming a bankrupt.

(2.) Herein may be considered, 1. Who may become a bankrupt. 2. The *acts* whereby he may become a bankrupt. 3. The *proceedings* on a commission of bankrupt. 4. How his *property* is transferred thereby.

(3.) Persons of full age, *using the trade* of merchandise, by buying, and selling, and seeking their livelihood thereby, are liable to become bankrupts; for debts of a sufficient amount.

(4.) A trader, who endeavours to avoid his creditors, or evade their just demands, by any of the ways specified in the several statutes of bankruptcy, doth thereby commit an *act* of bankruptcy.

(5.) The *proceedings* on a commission of bankrupt, so far as they affect the bankrupt himself, are principally by, 1. Petition. 2. Commission. 3. Declaration of bankruptcy. 4. Choice of assignees. 5. The bankrupt's surrender. 6. His examination. 7. His discovery. 8. His certificate. 9. His allowance. 10. His indemnity.

(6.) The *property* of a bankrupt's personal estate is, immediately upon the act of bankruptcy, veiled by construction of law in the assignees: and they, when they have collected, distribute the whole by equal dividends among all the creditors.

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#### SECT. XXXII. *Of title by testament, and administration.*

(1.) CONCERNING *testaments* and *administrations*, considered jointly, are to be observed, 1. Their *original and antiquity*. 2. *Who* may make a testament. 3. Its *nature and incidents*. 4. What are *executors* and *administrators*. 5. Their *office and duty*.

(2.) *Testaments* have subsisted in England immemorially; whereby the deceased was at liberty to dispose of his personal estate, reserving anciently to his wife and children their *reasonable part* of his effects.

(3.) The goods of *intestates* belonged anciently to the king; who granted them to the prelates to be disposed in pious uses: but, on their abuse of this trust in the times of popery, the legislature compelled them to delegate their power to *administrators* expressly provided by law.

(4.) *All persons* may make a testament, unless disabled by, 1. Want of discretion. 2. Want of free-will. 3. Criminal conduct.

(5.) *Testaments* are the legal declaration of a man's intentions, which he wills to be performed after his death. These are, 1. Written. 2. Nuncupative.

(6.) An *executor* is he, to whom a man by his will commits the execution thereof.

(7.) *Administrators* are, 1. *Durante minore etate* of an infant executor or administrator; or *durante absentia*; or *pendente lite*. 2. *Cum testamento annexo*; when no executor is named, or the executor refuses to act. 3. General administrators; in pursuance of the statutes of Edward III. and Henry VIII. 4. Administrators *de bonis non*; when a former executor or administrator dies without completing his trust.

(8.) The *office and duty* of executors, (and, in many points, of administrators also,) are, 1. To bury the deceased. 2. To prove the will, or take out administration. 3. To make an inventory. 4. To collect the goods and chattels. 5. To pay debts; observing

the rules of priority. 6. To pay legacies, either general or specific; if they be veiled, and not lapsed. 7. To distribute the undivided surplus, according to the statute of distributions.

### CHAP. III.

#### OF PRIVATE WRONGS.

SECT. I. *Of the redress of private wrongs, by the mere act of the parties.* xciv.

(1.) *WRONGS* are the privation of right; and are, 1. Private. 2. Public.

(2.) *Private wrongs*, or *civil injuries*, are an infringement, or privation, of the civil rights of individuals, considered as individuals.

(3.) The *redress* of civil injuries is one principal object of the laws of England.

(4.) This *redress* is effected, 1. By the mere *act* of the parties. 2. By the mere *operation of law*. 3. By *both together, or suit in court*.

(5.) *Redress*, by the mere *act* of the parties, is that which arises, 1. From the *sole act* of the party injured. 2. From the *joint act* of all the parties.

(6.) Of the first sort are, 1. Defence of one's self, or relations. 2. Recaption of goods. 3. Entry on lands and tenements. 4. Abatement of nuisances. 5. Distress; for rent, for suit or service, for amercements, for damage, or for divers statutable penalties; —made of such things only as are legally distrainable; —and taken and disposed of according to the due course of law. 6. Seizing of heriots, &c.

(7.) Of the second sort are, 1. Accord. 2. Arbitration.

SECT. II. *Of redress by the mere operation of law.* xcvi.

*Redress*, effected by the mere *operation of law*, is, 1. In the case of *retainer*; where a creditor is executor or administrator, and is thereupon allowed to retain his own debt. 2. In the case of *remitter*; where one, who has a *good title* to lands, &c. comes into possession by a *bad one*, and is thereupon remitted to his ancient good title, which protects his ill-acquired possession.

#### SECT. III. *Of courts in general.* xcvi.

(1.) *Redress*, that is effected by the *act* both of law and of the parties, is by *suit or action* in the courts of justice.

(2.) Herein may be considered, 1. The *courts* themselves. 2. The *cognizance* of wrongs, or injuries, therein. And, of *courts*, 1. Their *nature and incidents*. 2. Their several *species*.

(3.) A *court* is a place wherein justice is judicially administered, by officers delegated by the crown; being a court either of record, or not of record.

(4.) *Incident* to all courts are a plaintiff, defendant, and judge: and, with us, there are also usually attorneys; and advocates or counsel, viz. either barristers, or sergeants at law.

SECT. IV. *Of the public courts of common law and equity.* xcvi.

(1.) *Courts of justice*, with regard to their several *species*,



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*species*, are, 1. Of a *public*, or general, jurisdiction throughout the realm. 2. Of a *private*, or special, jurisdiction.

(2.) *Public* courts of justice are, 1. The courts of *common law* and *equity*. 2. The *ecclesiastical* courts. 3. The *military* courts. 3. The *maritime* courts.

(3.) The general and public courts of *common law* and *equity* are, 1. The court of *piepoudre*. 2. The court-baron. 3. The hundred court. 4. The county court. 5. The court of common pleas. 6. The court of king's bench. 7. The court of exchequer. 8. The court of chancery. (Which two last are courts of *equity* as well as *law*.) 9. The courts of exchequer-chamber. 10. The house of peers. To which may be added, as auxiliaries, 11. The courts of assize and *nisi prius*.

xcix. SECT. V. *Of courts ecclesiastical, military, and maritime.*

(1.) *ECCLESIASTICAL* courts, (which were separated from the temporal by William the Conqueror, or courts *Christian*, are, 1. The court of the archdeacon. 2. The court of the bishop's consistory. 3. The court of arches. 4. The court of peculiars. 5. The prerogative court. 6. The court of delegates. 7. The court of review.

(2.) The only permanent *military* court is that of chivalry; the courts martial, annually established by act of parliament, being only temporary.

(3.) *Maritime* courts are, 1. The court of admiralty and vice-admiralty. 2. The court of delegates. 3. The lords of the privy council, and others, authorised by the king's commission, for appeals in prize-causes.

c. SECT. VI. *Of courts of a special jurisdiction.*

COURTS of a special or private jurisdiction are, 1. The forest courts; including the courts of attachments, regard, *swienmote*, and justice-seat. 2. The court of commissioners of sewers. 3. The court of policies of assurance. 4. The court of the marshallsea and the palace court. 5. The courts of the principality of Wales. 6. The court of the duchy-chamber of Lancaster. 7. The courts of the counties palatine, and other royal franchises. 8. The *stannary* courts. 9. The courts of London, and other corporations.—To which may be referred the courts of requests, or courts of conscience; and the modern regulations of certain courts baron and county courts. 10. The courts of the two universities.

ci. SECT. VII. *Of the cognisance of private wrongs.*

(1.) ALL private wrongs or civil injuries are cognisable either in the courts *ecclesiastical*, *military*, *maritime*, or those of *common law*.

(2.) Injuries cognisable in the *ecclesiastical* courts are, 1. *Pecuniary*. 2. *Matrimonial*. 3. *Testamentary*.

(3.) *Pecuniary* injuries, here cognisable, are, 1. *Subtraction of tithes*. For which the remedy is by suit to compel their payment, or an equivalent; and also their double value. 2. *Nonpayment* of ecclesiastical dues. Remedy: by suit for payment. 3. *Spoilation*. Remedy: by suit for restitution. 4. *Dilapidations*. Remedy: by suit for damages. 5. *Non-repair* of the church, &c.; and *nonpayment* of church-rates. Re-

medy: by suit to compel them.

(4.) *Matrimonial* injuries are, 1. *Falsification of marriage*. Remedy: by suit for perpetual silence. 2. *Subtraction of conjugal rights*. Remedy: by suit for restitution. 3. *Inhability* for the marriage state. Remedy: by suit for divorce. 4. *Refusal* of decent maintenance to the wife. Remedy: by suit for alimony.

(5.) *Testamentary* injuries are, 1. *Disputing the validity of wills*. Remedy: by suit to establish them. 2. *Obstructing of administrations*. Remedy: by suit for the granting them. 3. *Subtraction of legacies*. Remedy: by suit for the payment.

(6.) The course of proceedings herein is much conformed to the civil and canon law: but their only compulsive process is that of excommunication; which is enforced by the temporal writ of *significavit*, or *de excommunicato capiendo*.

(7.) Civil injuries, cognisable in the court *military*, or court of chivalry, are, 1. Injuries in point of honour. Remedy: by suit for honourable amends. 2. *Encroachments in coat-armour*, &c. Remedy: by suit to remove them. The proceedings are in a summary method.

(8.) Civil injuries cognisable in the courts *maritime*, are injuries, in their nature of common-law cognisance, but arising wholly upon the sea, and not within the precincts of any county. The proceedings are herein also much conformed to the civil law.

(9.) All other injuries are cognisable only in the courts of *common law*: of which in the remainder of this chapter.

(10.) Two of them are, however, commisable by thes, and other, inferior courts; viz. 1. *Refusal, or neglect, of justice*. Remedies: by writ of *procedendo*, or *mandamus*. 2. *Encroachment of jurisdiction*. Remedy: by writ of prohibition.

SECT. VIII. *Of wrongs, and their remedies, respecting the rights of persons,*

(1.) In treating of the cognisance of injuries by the courts of *common law*, may be considered, 1. The injuries themselves, and their respective remedies. 2. The pursuit of those remedies in the several courts.

(2.) Injuries between subject and subject, cognisable by the courts of *common law*, are in general remedied by putting the party injured into possession of that right whereof he is unjustly deprived.

(3.) This is effected, 1. By *delivery* of the thing detained to the rightful owner. 2. Where that remedy is either impossible or inadequate, by giving the party injured a *satisfaction* in damages.

(4.) The instruments, by which these remedies may be obtained, are *suits* or *actions*; which are defined to be the legal demand of one's right: and these are, 1. *Personal*. 2. *Real*. 3. *Mixed*.

(5.) Injuries (whereof some are with, others without, force), are, 1. Injuries to the rights of persons. 2. Injuries to the rights of property. And the former are, 1. Injuries to the *absolute*. 2. Injuries to the *relative*, rights of persons.

(6.) The *absolute* rights of individuals are, 1. *Personal security*. 2. *Personal liberty*. 3. *Private property*. (See Chap. I. Sect. 1.) To which the injuries must be correspondent.

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(7.) Injuries to *personal security* are, 1. Against a man's *life*. 2. Against his *limbs*. 3. Against his *body*. 4. Against his *health*. 5. Against his *reputation*.—The first must be referred to the next chapter.

(8.) Injuries to the *limbs and body* are, 1. *Threats*. 2. *Assault*. 3. *Battery*. 4. *Wounding*. 5. *Mayhem*. Remedy: by action of trespass, *vi et armis*; for damages.

(9.) Injuries to *health*, by any unwholesome practices, are remedied by a special action of trespass, on the case; for damages.

(10.) Injuries to *reputation* are, 1. Slanderous and malicious *words*. Remedy: by action on the case; for damages. 2. *Libels*. Remedy: the same. 3. Malicious *prosecutions*. Remedy: by action of conspiracy, or on the case; for damages.

(11.) The sole injury to *personal liberty* is *false imprisonment*. Remedies: 1. By writ of, 1st, *Mainprize*; 2dly, *Odio et atia*; 3dly, *Homine replegiando*. 4thly, *Habeas corpus*; to remove the wrong. 2. By action of trespass; to recover damages.

(12.) For injuries to *private property*, see the next section.

(13.) Injuries to *relative rights* affect, 1. *Husbands*. 2. *Parents*. 3. *Guardians*. 4. *Masters*.

(14.) Injuries to an *husband* are, 1. *Abduction*, or taking away his wife. Remedy: by action of trespass, *de uxore rapta et abducta*; to recover possession of his wife, and damages. 2. *Criminal conversation* with her. Remedy: by action on the case; for damages. 3. *Beating her*. Remedy: by action on the case, *per quod consortium amittit*; for damages.

(15.) The only injury to a *parent*, or *guardian*, is the *abduction* of their children or wards. Remedy: by action of trespass, *de filiis, vel custodiis, raptis vel abductis*; to recover possession of them, and damages.

(16.) Injuries to a *master* are, 1. *Retaining his servants*. Remedy: by action on the case; for damages. 2. *Beating them*. Remedy: by action on the case, *per quod servitium amittit*; for damages.

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#### SECT. IX. Of injuries to personal property.

(1.) INJURIES to the rights of *property* are either to those of *personal*, or *real*, property.

(2.) *Personal property* is either in *possession*, or in *action*.

(3.) Injuries to *personal property in possession* are, 1. By *dispossession*. 2. By *damage*, while the owner remains in possession.

(4.) *Dispossession* may be effected, 1. By an *unlawful taking*. 2. By an *unlawful detaining*.

(5.) For the *unlawful taking* of goods and chattels *personal*, the remedy is, 1. *Actual restitution*, which (in case of a wrongful distress) is obtained by action of *replevin*. 3. *Satisfaction in damages*: 1st, in case of *rescous*, by action of *rescous*, poundbreach, or on the case; 2dly, in case of other unlawful takings, by action of trespass, or trover.

(6.) For the *unlawful detaining* of goods lawfully taken, the remedy is also, 1. *Actual restitution*; by action of *replevin*, or *detinue*. 2. *Satisfaction in damages*: by action on the case, for *trover and conversion*.

(7.) For *damage* to *personal property*, while in the owner's possession, the remedy is in damages; by ac-

tion of trespass *vi et armis*, in case the act be immediately injurious; or by action of trespass on the case, to redress consequential damage.

(8.) Injuries to *personal property, in action*, arise by breach of *contract*, 1. *Express*. 2. *Implied*.

(9.) Breaches of *express contracts* are, 1. By *nonpayment of debts*. Remedy: 1st, *Specific payment*; recoverable by action of debt. 2dly, *Damages for nonpayment*; recoverable by action on the case. 2. By *nonperformance of covenants*. Remedy: by action of covenant, 1st, to recover damages, in covenants *personal*; 2dly, to compel performance, in covenants *real*. 3. By *nonperformance of promises, or assumpsits*. Remedy: by action on the case; for damages.

(10.) *Implied contracts* are such as arise, 1. From the nature and constitution of *government*. 2. From *reason* and the construction of law.

(11.) Breaches of contracts, implied in the nature of *government*, are by the *nonpayment* of money which the laws have directed to be paid. Remedy: by action of debt; (which, in such cases, is frequently a *popular*, frequently a *qui tam*, action) to compel the specific payment: or, sometimes, by action on the case; for damages.

(12.) Breaches of contracts, implied in *reason* and construction of law, are by the *nonperformance* of legal presumptive *assumpsits*: for which the remedy is in damages; by an action on the case, on the implied *assumpsits*, 1. Of a *quantum meruit*. 2. Of a *quantum valebat*. 3. Of money expended for another. 4. Of receiving money to another's use. 5. Of an *infrinal computassent*, on an account stated; (the remedy on an account unstated being by action of account.) 6. Of performing one's duty, in any employment, with integrity, diligence, and skill. In some of which cases an action of deceit (or on the case, in nature of deceit,) will lie.

#### SECT. X. Of injuries to real property: and, first, of dispossession, or ouster, of the freehold.

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(1.) INJURIES affecting *real property* are, 1. *Ouster*. 2. *Trespass*. 3. *Nuisance*. 4. *Waste*. 5. *Subtraction*. 6. *Disturbance*.

(2.) *Ouster* is the amotion of possession; and is, 1. From *freeholds*. 2. From *chattels*; real.

(3.) *Ouster from freeholds* is effected by, 1. *Abatement*. 2. *Intrusion*. 3. *Disseisin*. 4. *Discontinuance*. 5. *Deforcement*.

(4.) *Abatement* is the entry of a stranger, after the death of the ancestor, before the heir.

(5.) *Intrusion* is the entry of a stranger, after a particular estate of freehold is determined, before him in remainder or reversion.

(6.) *Disseisin* is a wrongful putting out of him that is seized of the freehold.

(7.) *Discontinuance* is where tenant in tail, or the husband of tenant in fee, makes a larger estate of the land than the law alloweth.

(8.) *Deforcement* is any other detainer of the freehold from him who hath the property, but who never had the possession.

(9.) The universal remedy for all these is *restitution* or delivery of possession; and, sometimes, damages for the detention. This is effected, 1. By mere *entry*. 2. By action *possessory*. 3. By writ of *right*.

(10.)

(10.) Mere entry on lands, by him who hath the apparent right of possession, will (if peaceable) devest the mere possession of a wrongdoer. But forcible entries are remedied by immediate restitution, to be given by a justice of the peace.

(11.) Where the wrongdoer hath not only mere possession, but also an apparent right of possession, this may be devest by him who hath the actual right of possession, by means of the possessory actions of writ of entry, or assize.

(12.) A writ of entry is a real action, which improves the title of the tenant, by shewing the unlawful means under which he gained or continues possession. And it may be brought either against the wrongdoer himself, or in the degrees called the *per*, the *per* and *cui*, and the *post*.

(13.) An assize is a real action, which proves the title of the demandant, by shewing his own, or his ancestor's, possession. And it may be brought either to remedy abatements; viz. the assize of *mort d'ancestor*, &c.: Or to remedy recent disseisins; viz. the assize of *novel disseisin*.

(14.) Where the wrongdoer hath gained the actual right of possession, he who hath the right of property can only be remedied by a writ of *right*, or some writ of a similar nature. As, 1. Where such right of possession is gained by the discontinuance of tenant in tail. Remedy, for the right of property: by writ of *formedon*. 2. Where gained by recovery in a possessory action, had against tenants of particular estates by their own default. Remedy: by writ of *quod ei de forceat*. 3. Where gained by Recovery in a possessory action, had upon the merits.—4. Where gained by the *statute of limitations*. Remedy, in both cases: by a mere writ of *right*, the highest writ in the law.

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#### SECT. XI. Of dispossession, or ouster, of chattels real.

(1.) OUSTER from chattels real is, 1. From estates by statute and *elect*. 2. From an estate for years.

(2.) Ouster from estates by statute or *elect*, is effected by a kind of *disseisin*. Remedy: restitution and damages; by assize of *novel disseisin*.

(3.) Ouster from an estate for years, is effected by a like disseisin, or *ejectment*. Remedy: restitution, and damages; 1. By writ of *ejectione firmae*. 2. By writ of *quare ejecit infra terminum*.

(4.) A writ of *ejectione firmae*, or action of trespass in ejectment, lieth where lands, &c. are let for a term of years, and the lessee is ousted or ejected from his term; in which case he shall recover possession of his term, and damages.

(5.) This is now the usual method of trying titles to land, instead of an action real: viz. By, 1. The claimant's making an actual (or supposed) lease upon the land to the plaintiff. 2. The plaintiff's actual (or supposed) entry thereupon. 3. His actual (or supposed) ouster and ejectment by the defendant. For which injury this action is brought, either against the tenant, or (more usually) against some casual, or seditious, ejector; in whose stead the tenant may be admitted defendant, on condition that the lease, entry, and ouster be confessed, and that nothing else be disputed but the merits of the title claimed by the lessor of the plaintiff.

(6.) A writ of *quare ejecit infra terminum* is an action of a similar nature; only not brought against the wrongdoer or ejector himself, but such as are in possession under his title.

#### SECT. XII. Of trespass.

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TRESPASS is an entry upon, and damage done to, another's lands, by one's self, or one's cattle; without any lawful authority, or cause of justification: which is called a *breach of his close*. Remedy: damages; by action of trespass, *quare clausum fregit*: besides that of distress, damage feasant. But, unless the title to the land came chiefly in question, or the trespass was wilful or malicious, the plaintiff (if the damages be under forty shilling,) shall recover no more costs than damages.

#### SECT. XIII. Of nuisance.

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(1.) NUISANCE, or annoyance, is any thing that worketh damage or inconvenience: and it is either a public and common nuisance, of which in the next chapter; or, a private nuisance, which is any thing done to the hurt or annoyance of, 1. The corporeal, 2. The incorporeal, hereditaments of another.

(2.) The remedies for a private nuisance, (besides that of abatement,) are, 1. Damages; by action on the case; (which also lies for special prejudice by a public nuisance.) 2. Removal thereof, and damages; by assize of nuisance. 3. Like removal, and damages; by writ of *Quod permittat prosternere*.

#### SECT. XIV. Of waste.

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(1.) WASTE is a spoil and destruction in lands and tenements, to the injury of him who hath, 1. An immediate interest (as, by right of common) in the lands. 2. The remainder or reversion of the inheritance.

(2.) The remedies, for a commoner, are restitution, and damages; by assize of common: Or, damages only; by action on the case.

(3.) The remedy, for him in remainder, or reversion, is, 1. Preventive: by writ of *estrepement* at law, or injunction out of chancery; to stay waste. 2. Corrective: by action of waste; to recover the place wasted, and damages.

#### SECT. XV. Of subtraction.

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(1.) SUBTRACTION is when one, who owes services to another, withdraws or neglects to perform them. This may be, 1. Of rents, and other services, due by tenure. 2. Of those due by custom.

(2.) For subtraction of rents and services, due by tenure, the remedy is, 1. By distress; to compel the payment, or performance. 2. By action of debt; 3. By assize. 4. By writ of *consuetudinibus et servitiis*;—to compel the payment. 5. By writ of *cessavit*;—and 6. By writ of right *sur disclaimer*;—to recover the land itself.

(3.) To remedy the oppression of the lord, the law has also given, 1. The writ of *Ne injuste vexes*: 2. The writ of *mesne*.

(4.) For subtraction of services, due by custom, the remedy is, 1. By writ of *Seila ad molendinum, furnum, torrale, &c.* to compel the performance, and recovery of damages. 2. By action on the case; for damages only.

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# SECT. XVI. Of disturbance.

(1.) DISTURBANCE is the hindering, or disquieting, the owners of an incorporeal hereditament, in their regular and lawful enjoyment of it.

(2.) Disturbances are, 1. Of *franchises*. 2. Of *commons*. 3. Of *ways*. 4. Of *tenure*. 5. Of *patronage*.

(3.) Disturbance of *franchises*, is remedied by a special action on the case; for damages.

(4.) Disturbance of *commons*, is, 1. *Intercommoning* without right. Remedy: Damages; by an action on the case, or of trespass: besides distress, damage feasant; to compel satisfaction. 2. *Surcharging* the common. Remedies: Distress, damage feasant; to compel satisfaction: Action on the case; for damages: or, Writ of admeasurement of pasture; to apportion the common;—and writ of *secunda supererogatione*; for the supernumerary cattle, and damages. 3. *Inclusion*, or obstruction. Remedies: Restitution of the common, and damages; by assise of *novel disseisin*, and by writ of *quod permittat*: or, Damages only; by action on the case.

(5.) Disturbance of *ways*, is the obstruction, 1. Of a way in gross, by the owner of the land. 2. Of a way appendant, by a stranger. Remedy, for both: damages; by action on the case.

(6.) Disturbance of *tenure*, by driving away tenants, is remedied by a special action on the case; for damages.

(7.) Disturbance of *patronage*, is the hindrance of a patron to present his clerk to a benefice; whereof *usurpation*, within six months, is now become a species.

(8.) Disturbers may be, 1. The pseudo-patron, by his wrongful presentation. 2. His clerk, by demanding institution. 3. The ordinary, by refusing the clerk of the true patron.

(9.) The remedies are, 1. By assise of *darrein presentment*; 2. By writ of *quare impedit*;—to compel institution and recover damages: Consequent to which are the writs of *quare incumbravit*, and *quare non admittit*; for subsequent damages. 3. By writ of right of advowson; to compel institution, or establish the permanent right.

# SECT. XVII. Of injuries proceeding from, or affecting, the crown.

(1.) INJURIES to which the crown is a party are, 1. Where the crown is the aggressor. 2. Where the crown is the sufferer.

(2.) The crown is the aggressor, whenever it is in possession of any property to which the subject hath a right.

(3.) This is remedied, 1. By *petition of right*; where the right is grounded on facts disclosed in the petition itself. 2. By *monstrans de droit*; where the claim is grounded on facts, already appearing on record. The effect of both which is to remove the hands (or possession) of the king.

(4.) Where the crown is the sufferer, the king's remedies are, 1. By such common-law actions as are consistent with the royal dignity. 2. By *inquest of office*, to recover possession: which, when found, gives the king his right by solemn matter of record; but

may afterwards be traversed by the subject. 3. By writ of *scire facias*, to repeal the king's patent or grant. 4. By *information of intrusion*, to give damages for any trespass on the lands of the crown; or of *debt*, to recover moneys due upon contract, or forfeited by the breach of any penal statute; or sometimes (in the latter case) by *information in rem*: all filed in the exchequer *ex officio* by the king's attorney-general. 5. By writ of *quo warranto*, or information in the nature of such writ; to seize into the king's hands any franchise usurped by the subject, or to oust an usurper from any public office. 6. By writ of *mandamus*, unless cause; to admit or restore any person intitled to a franchise or office: to which if a false cause be returned, the remedy is by traverse, or by action on the case for damages; and, in consequence, a peremptory *mandamus*, or writ of restitution.

# SECT. XVIII. Of the pursuit of remedies by action; and, first, of the original writ.

(1.) THE pursuit of the several remedies furnished by the laws of England, is, 1. By *action* in the courts of common law. 2. By *proceedings* in the courts of equity.

(2.) Of an *action* in the court of *common pleas* (originally the proper court for prosecuting civil suits) the orderly parts are, 1. The *original writ*. 2. The *process*. 3. The *pleadings*. 4. The *issue*, or *demurrer*. 5. The *trial*. 6. The *judgment*. 7. The *proceedings* in nature of *appeal*. 8. The *execution*.

(3.) The *original writ* is the beginning or foundation of a suit, and is either *optional* (called a *præcipe*), commanding the defendant to do something in certain, or otherwise shew cause to the contrary; or *peremptory*, (called a *fi fecerit te securum*), commanding, upon security given by the plaintiff, the defendant to appear in court, to shew wherefore he hath injured the plaintiff: both issuing out of chancery under the king's great seal, and returnable in bank during term-time.

# SECT. XIX. Of process.

(1.) PROCESS is the means of compelling the defendant to appear in court.

(2.) This includes, 1. *Summons*. 2. The writ of attachment, or *pone*; which is sometimes the first or original process. 3. The writ of *distingas*, or distress infinite. 4. The writs of *capias ad respondendum*, and *testatum capias*: or, instead of these, in the king's bench, the bill of Middlesex, and writ of *latitat*;—and, in the exchequer, the writ of *quo minus*. 5. The *alias* and *pluries* writs. 6. The exigent, or writ of *exigi facias*, proclamations, and outlawry. 7. Appearance, and common bail. 8. The arrest. 9. Special bail, first to the sheriff, and then to the action.

# SECT. XX. Of pleadings.

PLEADINGS are the mutual altercations of the plaintiff and defendant in writing; under which are comprised, 1. The declaration or count; (wherein, incidentally, of the vine, nonuit, retraxit, and discontinuance.) 2. The defence, claim of cognizance, impleading, view,oyer, ad-prayer, voucher, or age; 3. The plea; which is either a *dilatory* plea, (1st, to the jurisdiction; 2dly, in disability of the plaintiff; 3dly, in abatement: ) or it is a plea to the action; sometimes

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times confessing the action, either in whole, or in part; (wherein of a tender, paying money into court, and set-off;) but usually denying the complaint, by pleading either, 1st, the general issue; or, 2dly, a special bar; (wherein of justifications, the statutes of limitation, &c.) 4. Replication, rejoinder, surrejoinder, rebutter, surrebutter, &c. Therein of estoppels, colour, duplicity, departure, new assignment, protraction, averment, and other incidents of pleading.

### SECT. XXI. *Of issue and demurrer.*

(1.) *Issue* is where the parties, in a course of pleading, come to a point affirmed on one side and denied on the other: which, if it be a matter of law, is called a *demurrer*; if it be a matter of fact, still retains the name of an *issue*, of fact.

(2.) *Continuance* is the detaining of the parties in court from time to time, by giving them a day certain to appear upon. And, if any new matter arises since the last continuance or adjournment, the defendant may take advantage of it, even after demurrer or issue, by alleging it in a plea *pau darrein continuance*.

(3.) The determination of an issue in law, or demurrer, is by the opinion of the judges of the court; which is afterwards entered on record.

### SECT. XXII. *Of the several species of trial.*

(1.) *TRIAL* is the examination of the matter of fact put in issue.

(2.) The species of trials are, 1. By the record. 2. By inspection. 3. By certificate. 4. By witnesses. 5. By wager of battel. 6. By wager of law. 7. By jury.

(3.) Trial by the record is had, when the existence of such record is the point in issue.

(4.) Trial by inspection or examination is had by the court, principally when the matter in issue is the evident object of the senses.

(5.) Trial by certificate is had in those cases, where such certificate must have been conclusive to a jury.

(6.) Trial by witnesses (the regular method in the civil law) is only used on a writ of dower, when the death of the husband is in issue.

(7.) Trial by wager of battel, in civil cases, is only had on a writ of right: but, in lieu thereof, the tenant may have, at his option, the trial by the grand assize.

(8.) Trial by wager of law is only had, where the matter in issue may be supposed to have been privily transacted, between the parties themselves, without the intervention of other witnesses.

### SECT. XXIII. *Of the trial by jury.*

(1.) *TRIAL* by jury is, 1. Extraordinary; as, by the grand assize, in writs of right; and by the grand jury, in writs of attain. 2. Ordinary.

(2.) The method and process of the ordinary trial by jury is, 1. The writ of *venire facias* to the sheriff, coroners, or clerks; with the subsequent compulsive process of *habeas corpora*, or *disfringas*. 2. The carrying down of the record to the court of *nisi prius*. 3. The sheriff's return; or panel of, 1st, special, 2dly, common jurors. 4. The challenges; 1st, to the array; 2dly, to the polls of the jurors; either, *propter honorem respectum*, *propter defectum*, *propter affectum*

(which is sometimes a principal challenge, sometimes to the favours), or *propter delictum*. 5. The *tales de circumstantibus*. 6. The oath of the jury. 7. The evidence; which is either by proofs, 1st, written; 2dly, parol;—or, by the private knowledge of the jurors. 6. The verdict; which may be, 1st, privy; 2dly, public; 3dly, special.

### SECT. XXIV. *Of judgment; and its incidents.*

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(1.) *WHATEVER* is transacted at the trial, in the court of *nisi prius*, is added to the record under the name of a *poslea*: consequent upon which is the judgment.

(2.) Judgment may be *arrested* or *stayed* for causes, 1. Extrinsic, or *dehors* the record; as in the case of *new trials*. 2. Intrinsic, or within it; as where the declaration varies from the writ, or the verdict from the pleadings, and issue; or where the case, laid in the declaration, is not sufficient to support the action in point of law.

(3.) Where the issue is immaterial, or insufficient, the court may award a *repleader*.

(4.) *Judgment* is the sentence of the law, pronounced by the court, upon the matter contained in the record.

(5.) Judgments are, 1. Interlocutory; which are incomplete till perfected by a writ of inquiry. 2. Final.

(6.) *Costs*, or expences of suit, are now the necessary consequence of obtaining judgment.

### SECT. XXV. *Of proceedings, in the nature of appeals.*

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(1.) *PROCEEDINGS*, in the nature of appeals from judgment, are, 1. A writ of *attaint*; to impeach the verdict of a jury; which of late has been superseded by new trials. 2. A writ of *audita querela*; to discharge a judgment by matter that has since happened. 3. A writ of *error*, from one court of record to another; to correct judgments, erroneous in point of law, and not helped by the statutes of amendment and *jeofails*.

(2.) Writs of error lie, 1. To the court of *king's bench*, from all inferior courts of record; from the court of *common-pleas* at Westminster; and from the court of *king's bench* in Ireland. 2. To the courts of *exchequer-chamber*, from the law side of the court of *exchequer*; and from proceedings in the court of *king's bench* by bill. 3. To the house of *peers*, from proceedings in the court of *king's bench* by original, and on writs of error; and from the several courts of *exchequer-chamber*.

### SECT. XXVI. *Of execution.*

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*EXECUTION* is the putting in force of the sentence or judgment of the law. Which is effected, 1. Where possession of any hereditament is recovered: by writ of *habere facias seisinam*, *possessionem*, &c. 2. Where any thing is awarded to be done or rendered, by a special writ for that purpose: as, by writ of abatement, in case of nuisance; *retorno habendo*, and *capias in withernam*, in replevin; *disfringas* and *seire facias*, in detinue. 3. Where money only is recovered; by writ of, 1st, *capias ad satisfaciendum*, against the body of the defendant; or, in default thereof, *seire facias*

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*cias* against his bail. 2dly, *Fieri facias*, against his goods and chattels. 3dly, *Levari facias*, against his goods and the profits of his lands. 4thly, *Elegit*, against his goods, and the possession of his lands. 5thly, *Extendi facias*, and other process, on statutes, recognizances, &c. against his body, lands, and goods.

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## SECT. XXVII. Of proceedings in the courts of equity.

(1.) MATTERS of equity which belong to the peculiar jurisdiction of the court of *chancery*, are, 1. The guardianship of infants. 2. The custody of idiots and lunatics. 3. The superintendence of charities. 4. Commissions of bankruptcy.

(2.) The court of *exchequer* and the duchy-court of *Lancaster*, have also some peculiar causes, in which the interest of the king is more immediately concerned.

(3.) *Equity* is the true sense and sound interpretation of the rules of law; and, as such, is equally attended to by the judges of the courts both of common law and equity.

(4.) The essential differences, whereby the English courts of equity are distinguished from the courts of law, are, 1. The mode of *proof*, by a discovery on the oath of the party; which gives a jurisdiction in matters of account, and fraud. 2. The mode of *trial*; by depositions taken in any part of the world. 3. The mode of *relief*; by giving a more specific and extensive remedy than can be had in the courts of law; as, by carrying agreements into execution, staying waste or other injuries by injunction, directing the sale of incumbered lands, &c. 4. The true construction of *securities* for money, by considering them merely as a pledge. 5. The execution of *trusts*, or second uses, in a manner analogous to the law of legal estates.

(5.) The proceedings in the court of *chancery*, (to which those in the *exchequer*, &c. very nearly conform,) are, 1. Bill. 2. Writ of *subpœna*; and, perhaps, injunction. 3. Process of contempt; viz. (ordinarily) attachment, attachment with proclamations, commission of rebellion, serjeant at arms, and sequestration. 4. Appearance. 5. Demurrer. 6. Plea. 7. Answer. 8. Exceptions; amendments; cross, or supplemental, bills; bills of revivor, interpleader, &c. 9. Replication. 10. Issue. 11. Depositions, taken upon interrogatories; and subsequent publication thereof. 12. Hearing. 13. Interlocutory decree; feigned issue, and trial; reference to the master, and report; &c. 14. Final decree. 15. Rehearing, or bill of review. 16. Appeal to parliament.

## CHAP. IV.

### OF PUBLIC WRONGS.

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## SECT. I. Of the nature of crimes, and their punishment.

(1.) IN treating of *public wrongs* may be considered, 1. The general nature of crimes and punishments. 2. The persons capable of committing crimes. 3. Their several degrees of guilt. 4. The several species of crimes, and their respective punishments. 5. The means of prevention. 6. The method of punishment.

(2.) A *crime*, or *misdeameour*, is an act committed, or omitted, in violation of a public law either forbidding or commanding it.

(3.) Crimes are distinguished from civil injuries, in that they are a breach and violation of the public rights, due to the whole community, considered as a community.

(4.) *Punishments* may be considered with regard to, 1. The power; 2. The end; 3. The measure;—of their infliction.

(5.) The power, or right, of inflicting human punishments for natural crimes, or such as are *mala in se*, was by the law of nature vested in every individual: but, by the fundamental contract of society, is now transferred to the sovereign power; in which also is vested, by the same contract, the right of punishing positive offences, or such as are *mala prohibita*.

(6.) The end of human punishments is to prevent future offences; 1. By amending the offender himself. 2. By deterring others through his example. 3. By depriving him of the power to do future mischief.

(7.) The measure of human punishments must be determined by the wisdom of the sovereign power, and not by any uniform universal rule: though that wisdom may be regulated, and assisted, by certain general, equitable, principles.

## SECT. II. Of the persons capable of committing crimes.

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(1.) ALL persons are capable of committing crimes unless there be in them a *defect of will*: for, to constitute a legal crime, there must be both a vitious will, and a vitious act.

(2.) The will does not concur with the act, 1. Where there is a defect of understanding. 2. Where no will is exerted. 3. Where the act is constrained by force and violence.

(3.) A vitious will may therefore be wanting, in the cases of, 1. Infancy. 2. Idiocy, or lunacy. 3. Drunkenness; which doth not, however, excuse. 4. Misfortune. 5. Ignorance, or mistake of fact. 6. Compulsion, or necessity; which is, 1st, that of civil subjection; 2dly, that of duress *per minas*; 3dly, that of choosing the least pernicious of two evils, where one is unavoidable; 4thly, that of want, or hunger; which is no legitimate excuse.

(4.) The king, from his excellence and dignity, is also incapable of doing wrong.

## SECT. III. Of principals and accessories.

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(1.) The different degrees of guilt in criminals are, 1. As principals. 2. As accessories.

(2.) A principal in a crime is, 1. He who commits the fact. 2. He who is present at, aiding, and abetting, the commission.

(3.) An accessory is he who doth not commit the fact, nor is present at the commission; but is in some sort concerned therein, either before or after.

(4.) Accessories can only be in petit treason, and felony: in high treason, and misdemeanours, all are principals.

(5.) An accessory, before the fact, is one who, being absent when the crime is committed, hath procured, counselled, or commanded, another to commit it.

(6.) An



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(6.) An accessory *after the fact*, is where a person, knowing a felony to have been committed, receives, relieves, comforts, or assists, the felon. Such accessory is usually entitled to the benefit of clergy; where the principal, and accessory *before the fact*, are excluded from it.

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#### SECT. IV. Of offences against God and religion.

(1.) CRIMES and misdemeanours cognizable by the laws of England are such as more immediately offend, 1. God, and his holy religion. 2. The law of nations. 3. The king, and his government. 4. The public, or commonwealth. 5. Individuals.

(2.) Crimes more immediately offending God and religion are, 1. *Apostasy*. For which the penalty is incapacity, and imprisonment. 1. *Heresy*. Penalty, for one species thereof: the same. 3. Offences against the established church:—Either, by *reviling its ordinances*. Penalties: fine; deprivation; imprisonment; forfeiture.—Or, by *nonconformity* to its worship: 1st, 'Thro' total *irreligion*. Penalty: fine. 2dly, 'Thro' protestant *dissentings*. Penalty: suspended by the toleration act. 3dly, 'Thro' *popery*, either in professors of the popish religion, popish recusants, convict, or popish priests. Penalties: incapacity; double taxes; imprisonment; fines; forfeitures; abjuration of the realm; judgment of felony, without clergy; and judgment of high treason. 4. *Blasphemy*. Penalty: fine, imprisonment, and corporal punishment. 5. *Prophane swearing and cursing*. Penalty: fine, or house of correction. 6. *Witchcraft*; or, at least, the pretence thereto. Penalty: imprisonment, and pillory. 7. *Religious impostures*. Penalty: fine, imprisonment, and corporal punishment. 8. *Simony*. Penalties: forfeiture of double value; incapacity. 9. *Sabbath-breaking*. Penalty: fine. 10. *Drunkenness*. Penalty: fine, or stocks. 11. *Lewdness*. Penalties: fine; imprisonment; house of correction.

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#### SECT. V. Of offences against the law of nations.

(1.) The law of nations is a system of rules, deducible by natural reason, and established by universal consent, to regulate the intercourse between independent states.

(2.) In England, the law of nations is adopted in its full extent, as part of the law of the land.

(3.) Offences against this law are principally incident to whole states or nations; but, when committed by private subjects, are then the objects of the municipal law.

(4.) Crimes against the law of nations, animated on by the laws of England, are, 1. Violation of *safe-conducts*. 2. Infringement of the rights of *ambassadors*. Penalty, in both: arbitrary. 3. *Piracy*. Penalty: judgment of felony, without clergy.

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#### SECT. VI. Of high treason.

(1.) CRIMES and misdemeanours more peculiarly offending the king and his government are, 1. *High treason*. 2. *Felonies* injurious to the prerogative. 3. *Præmunire*. 4. Other *misprisions and contempts*.

(2.) *High treason* may, according to the statute of Edward III. be committed, 1. By *compassing or imagining the death of the king, or queen-consort, or their eldest son and heir*; demonstrated by some overt act,

2. By *violating the king's companion, his eldest daughter, or the wife of his eldest son*. 3. By some overt act of *levying war against the king in his realm*. 4. By *adherence to the king's enemies*. 5. By *counterfeiting the king's great or privy seal*. 6. By *counterfeiting the king's money, or importing counterfeit money*. 7. By *killing the chancellor, treasurer, or king's justices, in the execution of their offices*.

(3.) *High treasons*, created by subsequent statutes, are such as relate, 1. To *papists*: as, the repeated defence of the Pope's jurisdiction; the coming from beyond sea of a natural-born Popish priest; the renouncing of allegiance, and reconciliation to the Pope or other foreign power. 2. To the *coinage*, or other sign, nature of the king: as, counterfeiting (or, importing and uttering counterfeit) foreign coin, here current; forging the sign manual, privy signet, or privy seal; falsifying, &c. the current coin. 3. To the *protestant succession*: as, corresponding with, or remitting to, the late Pretender's sons; endeavouring to impede the succession; writing or printing, in defence of any Pretender's title, or in derogation of the act of settlement, or of the power of parliament to limit the descent of the crown.

(4.) The punishment of high treason, in *males*, is (generally) to be, 1. Drawn. 2. Hanged. 3. Embowelled alive. 4. Beheaded. 5. Quartered. 6. The head and quarters to be at the king's disposal. But, in treasons relating to the coin, only to be drawn, and hanged till dead. *Females*, in both cases, are to be drawn, and burned alive.

#### SECT. VII. Of felonies injurious to the king's prerogative.

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(1.) FELONY is that offence which occasions the total forfeiture of lands or goods at common law; now usually also punishable with death, by hanging; unless through the benefit of clergy.

(2.) *Felonies* injurious to the king's prerogative (of which some are within, others without, clergy) are, 1. Such as relate to the *coin*: as, the wilful uttering of counterfeit money, &c.; (to which head some inferior misdemeanours affecting the coinage may be also referred). 2. Conspiring or attempting to kill a *privy counsellor*. 3. Serving *foreign states*, or enlisting soldiers for *foreign service*. 4. Embezzling the king's *armour or stores*. 5. *Desertion* from the king's armies, by land or sea.

#### SECT. VIII. Of præmunire.

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(1.) PRÆMUNIRE, in its original sense, is the offence of adhering to the temporal power of the Pope, in derogation of the regal authority. Penalty: outlawry, forfeiture, and imprisonment: which hath since been extended to some offences of a different nature.

(2.) Among these are, 1. Importing Popish *trinkets*. 2. Contributing to the maintenance of Popish seminaries abroad, or Popish priests in England. 3. Molesting the possessors of *abbey-lands*. 4. Acting as broker in an usurious contract, for more than ten per cent. 5. Obtaining any *stay* of proceedings in suits for monopolies. 6. Obtaining an exclusive patent for gunpowder or arms. 7. Exertion of purveyance or pre-emption. 8. Asserting a legislative authority in both or either house of parliament. 9. Sending any subjects

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subject a prisoner beyond sea. 10. Refusing the oaths of allegiance and supremacy. 11. Preaching, teaching, or advised speaking, in defence of the right of any pretender to the crown, or in derogation of the power of parliament to limit the succession. 12. Treating of other matters, by the assembly of peers of Scotland, convened for electing their representatives in parliament. 15. Unwarrantable undertakings by unlawful subscriptions to public funds.

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#### SECT. IX. *Of misprisions and contempts affecting the king and government.*

(1.) MISPRISIONS and *contempts* are all such high offences as are under the degree of capital.

(2.) These are, 1. *Negative*, in concealing what ought to be revealed. 2. *Positive*, in committing what ought not to be done.

(3.) *Negative* misprisions are, 1. Misprison of *treason*. Penalty: forfeiture and imprisonment. 2. Misprison of *felony*. Penalty: fine and imprisonment. 3. Concealment of *treasure trove*. Penalty: fine and imprisonment.

(4.) *Positive* misprisions, or high misdemeanors and contempts, are, 1. *Mal-administration* of public trusts, which includes the crime of *peculation*. Usual penalties: banishment; fines; imprisonment; disability. 2. Contempts against the king's *prerogative*. Penalty: fine, and imprisonment. 3. Contempt against his *person and government*. Penalty: fine, imprisonment, and infamous corporal punishment. 4. Contempts against his *title*. Penalties: fine, and imprisonment; or fine, and disability. 5. Contempts against his *palaces, or courts of justice*. Penalties: fine; imprisonment; corporal punishment; loss of right hand; forfeiture.

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#### SECT. X. *Of offences against public justice.*

(1.) CRIMES especially affecting the *commonwealth* are offences, 1. Against the *public justice*. 2. Against the *public peace*. 3. Against the *public trade*. 4. Against the *public health*. 5. Against the *public police or economy*.

(2.) Offences against the *public justice*, are, 1. *Embezzling* or *vacating* records, and *personating* others in courts of justice. Penalty: judgment of felony, usually without clergy. 2. *Compelling* prisoners to become *approvers*. Penalty: judgment of felony.—3. *Obstructing* the execution of process. 4. *Escapes*. 5. *Breach* of prison. 6. *Refuse*.—Which four may, (according to the circumstances), be either felonies, or misdemeanors punishable by fine and imprisonment. 7. *Returning* from *transportation*. This is felony, without clergy. 8. Taking *rewards*, to *help* one to his stolen goods. Penalty: the same as for the theft. 9. *Receiving* stolen goods. Penalties: transportation; fine; and imprisonment.—10. *Theftbote*. 11. Common *barretry*, and suing in a feigned name. 12. *Maintenance*. 13. *Champerty*. Penalty, in these four: fine, and imprisonment. 14. *Compounding* prosecutions on penal statutes. Penalty: fine, pillory, and disability. 15. *Conspiracy*; and threats of accusation in order to extort money, &c. Penalties: the villenous judgment; fine; imprisonment; pillory; whipping; transportation. 16. *Perjury*, and subornation thereof. Penalties: infamy; imprisonment; fine, or pillory; and, sometimes, transportation or house of correction. 17. *Bri-*

*bery*. Penalty: fine, and imprisonment. 18. *Embriacery*. Penalty: infamy, fine, and imprisonment. 19. *False verdict*. Penalty: the judgment in attaint. 20. *Negligence* of public officers, &c. Penalty: fine, and forfeiture of the office. 21. *Oppression* by magistrates. 22. *Extortion* of officers. Penalty, in both: imprisonment, fine, and sometimes forfeiture of the office.

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#### SECT. XI. *Of offences against the public peace.*

OFFENCES against the *public peace* are, 1. *Riotous assemblies* to the number of *twelve*. 2. Appearing armed, or hunting in *disguise*. 3. *Threatening*, or *demanding* any valuable thing, by letter.—All these are felonies, without clergy. 4. *Destruction* of *turnpikes*, &c. Penalties: whipping; imprisonment; judgment of felony, with and without clergy.—5. *Affrays*. 6. *Riots, routs*, and *unlawful assemblies*. 7. *Tumultuous petitioning*. 8. *Forcibly entry*, and *detainer*. Penalty, in all four: fine, and imprisonment. 9. *Going unusually armed*. Penalty: forfeiture of arms, and imprisonment. 10. *Spreading false news*. Penalty: fine, and imprisonment. 11. *Pretended prophecies*. Penalties: fine; imprisonment; and forfeiture. 12. *Challenges* to fight. Penalty: fine, imprisonment, and sometimes forfeiture. 13. *Libels*. Penalty: fine, imprisonment, and corporal punishment.

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#### SECT. XII. *Of offences against public trade.*

OFFENCES against the *public trade*, are, 1. *Swearing*. Penalties: fines; forfeiture; imprisonment; loss of left hand; transportation; judgment of felony. 2. *Smuggling*. Penalties: fines; loss of goods; judgment of felony, without clergy. 3. *Fraudulent bankruptcy*. Penalty: judgment of felony without clergy. 5. *Urgery*. Penalty: fine, and imprisonment. 5. *Cheating*. Penalties: fine; imprisonment; pillory; tumbrel; whipping; or other corporal punishment; transportation.—6. *Forestalling*. 7. *Regrating*. 8. *Engrossing*. Penalties, for all three: loss of goods; fine; imprisonment; pillory. 9. *Monopolies*, and combinations to raise the price of commodities. Penalties: fines; imprisonment; pillory; loss of ear; infamy; and, sometimes, the pains of *praemunire*. 10. *Exercising a trade*, not having served as an apprentice. Penalty; fine. 11. *Transporting*, or *residing abroad*, of *artificers*. Penalties: fine; imprisonment; forfeiture; incapacity; becoming aliens.

cxixv.

#### SECT. XIII. *Of offences against the public health, and the public police or economy.*

(1.) OFFENCES against the *public health* are, 1. *Irregularity*, in the time of the *plague*, or of *quarantine*. Penalties: whipping; judgment of felony, with and without clergy. 2. *Selling unwholesome provisions*. Penalties: amercement; pillory; fine; imprisonment; abjuration of the town.

(2.) Offences against the *public police or economy* or domestic order of the kingdom, are, 1. Those relating to *clandestine* and *irregular marriages*. Penalties: judgment of felony, with and without clergy. 2. *Bigamy*, or (more properly) *polygamy*. Penalty: judgment of felony.—3. *Wandering*, by *soldiers or mariners*. 4. *Remaining* in England, by *Egyptians*; or being in their *fellowship* one month. Both these are felonies, without clergy. 5. *Common nuisances*, 1<sup>st</sup>, by annoy-

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annoyances or purpessures in highways, bridges, and rivers; *2dly*, by offensive trades and manufactures; *3dly*, by disorderly houses; *4thly*, by lotteries; *5thly*, by cottages; *6thly*, by fireworks; *7thly*, by eveldropping. Penalty, in all; fine.—*8thly*, By common scolding. Penalty: the cucking stool. 6. *Idleness, disorder, vagrancy, and incorrigible roguery*. Penalties: imprisonment; whipping; judgment of felony. 7. *Luxury*, in diet. Penalty, discretionary. 8. *Gaming*. Penalties: to gentlemen, fines; to others, fine and imprisonment; to cheating gamblers, fine, infamy, and the corporal pains of perjury. 9. *Destroying the game*. Penalties: fines, and corporal punishment.

#### SECT. XIV. *Of homicide.*

(1.) CRIMES especially affecting individuals are, 1. Against their persons. 2. Against their habitations. 3. Against their property.

(2.) Crimes against the persons of individuals, are, 1. By homicide, or destroying life. 2. By other corporal injuries.

(3.) Homicide is, 1. *Justifiable*. 2. *Excusable*. 3. *Felonious*.

(4.) Homicide is *justifiable*, 1. By necessity, and command of law. 2. By permission of law; *1st*, for the furtherance of public justice; *2dly*, for prevention of some forcible felony.

(5.) Homicide is *excusable*, 1. *Per infortunium*, or by mis-adventure. 3. *Se defendendo*, or in self-defence, by chance-medley. Penalty, in both: forfeiture of goods; which however is pardoned of course.

(6.) *Felonious homicide* is the killing of a human creature without justification or excuse. This is, 1. Killing one's self. 2. Killing another.

(7.) Killing one's self, or self-murder, is where one deliberately, or by any unlawful malicious act, puts an end to his own life. This is felony; punished by ignominious burial, and forfeiture of goods and chattels.

(8.) Killing another is, 1. *Manslaughter*. 2. *Murder*.

(9.) *Manslaughter* is the unlawful killing of another, without malice, express or implied. This is either, 1. Voluntary, upon a sudden heat. 2. Involuntary, in the commission of some unlawful act. Both are felony, but within clergy; except in the case of *stabbing*.

(10.) *Murder* is when a person, of sound memory and discretion, unlawfully killeth any reasonable creature, in being, and under the king's peace; with malice aforethought, either express or implied. This is felony, without clergy; punished with speedy death, and hanging in chains, or dissection.

(11.) *Petit treason* (being an aggravated degree of murder) is where the servant kills his master, the wife her husband, or the ecclesiastic his superior. Penalty: in men, to be drawn and hanged; in women, to be drawn and burned.

cxkxvii.

#### SECT. XV. *Of offences against the persons of individuals.*

CRIMES affecting the persons of individuals, by other corporal injuries not amounting to homicide, are, 1. *Mayhem*; and also *shooting* at another. Penalties: fine; imprisonment; judgment of felony, without cler-

gy. 2. *Forcible abduction, and marriage or defilement*, of an heiress; which is felony: also, *stealing, and deflowering or marrying*, any woman-child under the age of sixteen years; for which the penalty is imprisonment, fine, and temporary forfeiture of her lands.—3. *Rape*, and also *carnal knowledge*, of a woman-child under the age of ten years. 4. *Buggery*, with man or beast. Both these are felonies, without clergy.—5. *Assault*. 6. *Battery*; especially of clergymen. 7. *Wounding*. Penalties, in all three: fine; imprisonment; and other corporal punishment. 8. *False imprisonment*. Penalties: fine; imprisonment; and (in some atrocious cases) the pains of *pæmuniæ*, and incapacity of office or pardon. 9. *Kidnapping*, or forcibly stealing away the king's subjects. Penalty: fine; imprisonment; and pillory.

#### SECT. XVI. *Of offences against the habitations of individuals.*

cxkxviii.

(1.) CRIMES, affecting the habitation of individuals, are, 1. *Arson*. 2. *Burglary*.

(2.) *Arson* is the malicious and wilful burning of the house, or out-house, of another man. This is felony; in some cases within, in others without, clergy.

(3.) *Burglary* is the breaking and entering, by night, into a mansion-house; with intent to commit a felony. This is felony, without clergy.

#### SECT. XVII. *Of offences against private property.*

cxkxix.

(1.) CRIMES affecting the private property of individuals are, 1. *Larceny*. 2. *Malicious mischief*. 3. *Forgery*.

(2.) *Larceny* is, 1. *Simple*. 2. *Mixed*, or *compound*.

(3.) *Simple larceny* is the felonious taking, and carrying away, of the personal goods of another. And it is, 1. *Grand larceny*; being above the value of twelve pence. Which is felony; in some cases within, in others without, clergy. 2. *Petit larceny*; to the value of twelve pence or under. Which is also felony, but not capital; being punished with whipping, or transportation.

(4.) *Mixed, or compound, larceny* is that wherein the taking is accompanied with the aggravation of being, 1. From the house. 2. From the person.

(5.) *Larcinies from the house*, by day or night, are felonies without clergy, when they are, 1. *Larcinies, above twelve pence, from a church*;—or by breaking a tent or booth in a market or fair, by day or night, the owner or his family being therein;—or by breaking a dwelling-house by day, any person being therein;—or from a dwelling-house by day, without breaking, any person therein being put in fear;—or from a dwelling-house by night, without breaking, the owner or his family being therein and put in fear. 2. *Larcinies, of five shillings, by breaking the dwelling-house, shop, or warehouse, by day, though no person be therein;—or, by privately stealing in any shop, warehouse, coach-house, or stable, by day or night, without breaking, and though no person be therein*. 3. *Larcinies, of forty shillings, from a dwelling-house or its out-houses, without breaking, and though no person be therein*.

(6.) *Larceny from the person* is, 1. *By privately stealing*, from the person of another, above the value of twelve pence. 2. *By robbery*; or the felonious and forcible



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forcible taking, from the person of another, in or near the highway, goods or money of any value, by putting him in fear. These are both felonies without clergy. An attempt to rob is also felony.

(7.) Malicious *mischief*, by destroying dikes, goods, cattle, ships, garments, shipwrecks, trees, woods, churches, chapels, meeting-houses, houses, out-houses, corn, hay, straw, sea or river banks, hopbuds, coal-mines (or engines thereunto belonging), or any fences for inclosures by act of parliament, is felony; and, in most cases, without benefit of clergy.

(8.) *Forgery* is the fraudulent making or alteration of a writing, in prejudice of another's right. Penalties: fine; imprisonment; pillory; loss of nose and ears; forfeiture; judgment of felony, without clergy.

cxl. **SECT. XVIII. Of the means of preventing offences.**

(1.) CRIMES and misdemeanours may be prevented, by compelling suspected persons to give security: which is effected by binding them in a conditional recognizance to the king, taken in court, or by a magistrate.

(2.) These recognizances may be conditioned, 1. To keep the peace. 2. To be of the good behaviour.

(3.) They may be taken by any justice or conservator of the peace, at his own discretion; or, at the request of such as are intitled to demand the same.

(4.) All persons, who have given sufficient cause to apprehend an intended breach of the peace, may be bound over to keep the peace; and all those, that be not of good fame, may be bound to the good behaviour; and may, upon refusal in either case, be committed to gaol.

cxli. **SECT. XIX. Of courts of a criminal jurisdiction.**

(1.) In the method of punishment may be considered, 1. The several courts of criminal jurisdiction. 2. The several proceedings therein.

(2.) The criminal courts are, 1. Those of a public and general jurisdiction throughout the realm. 2. Those of a private and special jurisdiction.

(3.) Public criminal courts are, 1. The high court of parliament; which proceeds by impeachment. 2. The court of the lord high steward; and the court of the king in full parliament: for the trial of capitally indicted peers. 3. The court of king's bench. 4. The court of chivalry. 5. The court of admiralty, under the king's commission. 6. The courts of oyer and terminer, and general goal-delivery. 7. The court of quarter-sessions of the peace. 8. The sheriff's tourn. 9. The court leet. 10. The court of the coroner. 11. The court of the clerk of the market.

(4.) Private criminal courts are, 1. The court of the lord steward, &c. by statute of Henry VII. 2. The court of the lord steward, &c. by statute of Henry VIII. 3. The university courts.

cxlii. **SECT. XX. Of summary convictions.**

(1.) PROCEEDINGS in criminal courts are, 1. Summary. 2. Regular.

(2.) Summary proceedings are such, whereby a man may be convicted of divers offences, without any formal process or jury, at the discretion of the judge or

judges appointed by act of parliament, or common law.

(3.) Such are, 1. Trials of offences and frauds against the laws of excise and other branches of the king's revenue. 2. Convictions before justices of the peace upon a variety of minute offences, chiefly against the public police. 3. Attachments for contempts to the superior courts of justice.

**SECT. XXI. Of arrests.**

cxliii.

(1.) REGULAR proceedings in the courts of common law, are, 1. Arrest. 2. Commitment and bail. 3. Prosecution. 4. Process. 5. Arraignment, and its incidents. 6. Plea and issue. 7. Trial and conviction. 8. Clergy. 9. Judgment, and its consequences. 10. Reversal of judgment. 11. Reprieve or pardon. 12. Execution.

(2.) An arrest is the apprehending, or restraining, of one's person; in order to be forthcoming to answer a crime whereof one is accused or suspected.

(3.) This may be done, 1. By warrant. 2. By an officer, without warrant. 3. By a private person, without warrant. 4. By hue and cry.

**SECT. XXII. Of commitment and bail.**

cxliv.

(1.) COMMITMENT is the confinement of one's person in prison, for safe custody, by warrant from proper authority; unless, in bailable offences, he puts in sufficient bail, or security for his future appearance.

(2.) The magistrate is bound to take reasonable bail, if offered; unless the offender be not bailable.

(3.) Such are, 1. Persons accused of treason; or, 2. Of murder; or, 3. Of manslaughter, by indictment; or if the prisoner was clearly the slayer. 4. Prison-breakers, when committed for felony. 5. Outlaws. 6. Those who have abjured the realm. 7. Approvers, and appellers. 8. Persons taken with the mainour. 9. Persons accused of arson. 10. Excommunicated persons.

(4.) The magistrate may, at his discretion, admit to bail, or otherwise, persons not of good fame, charged with other felonies, whether as principals or as accessories.

(5.) If they be of good fame, he is bound to admit them to bail.

(6.) The court of king's bench, or its judges in time of vacation, may bail in any case whatsoever.

**SECT. XXIII. Of the several modes of prosecution.**

cxlv.

(1.) PROSECUTION, or the manner of accusing offenders, is either by a previous finding of a grand jury; as, 1. By presentment. 2. By indictment. Or, without such finding, 3. By information. 4. By appeal.

(2.) A presentment is the notice taken by a grand jury of any offence, from their own knowledge or observation.

(3.) An indictment is a written accusation of one or more persons of a crime or misdemeanor, preferred to, and presented on oath by, a grand jury; expressing, with sufficient certainty, the person, time, place, and offence.

(4.) An information is, 1. At the suit of the king and a subject, upon penal statutes. 4. At the suit of the

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the king only. Either, 1. Filed by the attorney-general *ex officio*, for such misdemeanours as affect the king's person or government: or, 2. Filed by the master of the crown-office (with leave of the court of king's bench) at the relation of some private subject, for other gross and notorious misdemeanours. All differing from indictments in this; that they are exhibited by the informer, or the king's officer; and not on the oath of a grand jury.

(5.) An *appeal* is an accusation or suit, brought by one private subject against another, for larciny, rape, mayhem, arson, or homicide; which the king cannot discharge or pardon, but the party alone can release.

calvi. **SECT. XXIV. Of process upon an indictment.**

(1.) PROCESS to bring in an offender, when indicted in his absence, is, in misdemeanour, by *venire facias*, distress infinite, and *capias*: in capital crimes, by *capias* only: and, in both, by outlawry.

(2.) During this stage of proceedings, the indictment may be removed into the court of king's bench from any inferior jurisdiction, by writ of *certiorari facias*: and cognizance must be claimed in places of exclusive jurisdiction.

cxlvii. **SECT. XXV. Of arraignment, and its incidents.**

(1.) ARRAIGNMENT is the calling of the prisoner to the bar of the court, to answer the matter of the indictment.

(2.) Incident herunto are, 1. The standing mute of the prisoner; for which, in petit treason, and felonies of death, he shall undergo the *peine fort & dure*. 2. His confession; which is either *simple*, or by way of *approvement*.

cxlviii. **SECT. XXVI. Of plea, and issue.**

(1.) THE *plea*, or defensive matter alleged by the prisoner, may be, 1. A plea to the jurisdiction. 2. A demurrer in point of law. 3. A plea in abatement. 4. A special plea in bar; which is, 1st, *Auterfoits acquit*; 2dly, *Auterfoits convict*; 3dly, *Auterfoits attaint*; 4thly, a pardon. 5. The general issue, not guilty.

2. Hereupon *issue* is joined by the clerk of the arraigns, on behalf of the king.

cxlix. **SECT. XXVII. Of trial, and conviction.**

(1.) TRIALS of offences, by the laws of England were and are, 1. By *ordeal*, of either fire or water. 2. By the *corfned*. Both these have been long abolished. 3. By *battel*, in appeals and approvements. 4. By the *peers* of Great Britain. 5. By *jury*.

(2.) The method and process of trial by *jury* is, 1. The impanelling of the jury. 2. Challenges; 1st, for cause; 2dly, peremptory. 3. *Tales de circumstantibus*. 4. The oath of the jury. 5. The evidence. 6. The verdict, either general or special.

(3.) *Conviction* is when the prisoner pleads, or is found, guilty: whereupon, in felonies, the prosecutor is intitled to, 1. His expenses. 2. Restitution of his goods.

cli. **SECT. XXVIII. Of the benefit of clergy.**

(1.) CLERGY, or the benefit thereof, was originally derived from the usurped jurisdiction of the Popish

ecclesiastics; but hath since been new-modelled by several statutes.

(2.) It is an exemption of the clergy from any other secular punishment for felony, than imprisonment for a year, at the court's discretion; and it is extended likewise, absolutely, to lay peers, for the first offence; and to all lay-commoners, for the first offence also, upon condition of branding, imprisonment, or transportation.

(3.) All felonies are intitled to the benefit of clergy, except such as are now ousted by particular statutes.

(4.) Felons, on receiving the benefit of clergy, (tho' they forfeit their goods to the crown,) are discharged of all clergyable felonies before committed, and restored in all capacities and credits.

clii. **SECT. XXIX. Of judgment, and its consequences.**

(1.) JUDGMENT (unless any matter be offered in arrest thereof) follows upon conviction; being the pronouncing of that punishment which is expressly ordained by law.

(2.) *Attainder* of a criminal is the immediate consequence, 1. Of having judgment of death pronounced upon him. 2. Of outlawry for a capital offence.

(3.) The consequences of attainder are, 1. *Forfeiture* to the king. 2. *Corruption of blood*.

(4.) *Forfeiture* to the king, is, 1. Of real estates, upon attainder;—in high treason, absolutely, till the death of the late Pretender's sons;—in felonies, for the king's year, day, and waste;—in misprision of treason, assaults on a judge, or battery sitting the courts; during the life of the offender. 2. Of personal estates, upon conviction; in all treason, misprision of treason, felony, excusable homicide, petit larciny, standing mute upon arraignment, the above-named contempts of the king's courts, and flight.

(5.) *Corruption of blood* is an utter extinction of all inheritable quality therein: so that, after the king's forfeiture is first satisfied, the criminal's lands escheat to the lord of the fee; and he can never afterwards inherit, be inherited, or have any inheritance derived through him.

cliii. **SECT. XXX. Of reversal of judgment.**

(1.) JUDGMENTS, and their consequences, may be avoided, 1. By *falsifying*, or *reversing*, the attainder. 2. By *reprieve*, or *pardon*.

(2.) Attainders may be *falsified*, or *reversed*, 1. Without a writ of error; for matter *dehors* the record. 2. By writ of error; for mistakes in the judgment, or record. 3. By act of parliament; for favour.

(3.) When an *outlawry* is reversed, the party is restored to the same plight as if he had appeared upon the *capias*. When a *judgment*, on conviction, is reversed, the party stands as if never accused.

cliv. **SECT. XXXI. Of reprieves and pardon.**

(1.) A REPRIEVE is a temporary suspension of the judgment, 1. *Ex arbitrio judicis*. 2. *Ex necessitate legis*; for pregnancy, insanity, or the trial of identity of person, which must always be tried *instantly*.

(2.) A pardon is a permanent avoider of the judgment by the king's majesty, in offences against his crown and dignity; drawn in due form of law, allowed in

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in open court, and thereby making the offender a new man.

(3.) The king cannot pardon, 1. Imprisonment of the subject beyond the seas. 2. Offences prosecuted by appeal. 3. Common nufances. 4. Offences against popular or penal statutes, after information brought by a subject. Nor is his pardon pleadable to an impeachment by the commons in parliament.

## PART III. THE LAW OF SCOTLAND.

## SECT. XXXII. Of execution.

Law of  
Scotland.

cliv.

(1.) EXECUTION is the completion of human punishment, and must be strictly performed in the manner which the law directs.

(2.) The warrant for execution is sometimes under the hand and seal of the judge; sometimes by writ from the king; sometimes by rule of court; but commonly by the judge's signing the calendar of prisoners, with their separate judgments in the margin.

clv.

Municipal  
law.

## GENERAL OBSERVATIONS.

1. THE municipal law of Scotland, as of most other countries, consists partly of statutory or written law, which has the express authority of the legislative power; partly of customary or unwritten law, which derives force from its presumed or tacit consent.

Statutory  
law.  
Acts of par-  
liament.

2. Under our statutory or written law is comprehended, (1.) Our acts of parliament: not only those which were made in the reign of James I. of Scotland, and from thence down to our union with England in 1707, but such of the British statutes enacted since the union as concerned this part of the united kingdom.

Regiam  
Majestatem

3. The remains of our ancient written law were published by Sir John Skene clerk-register, in the beginning of the last century, by licence of parliament. The books of *Regiam Majestatem*, to which the whole collection owes its title, seem to be a system of Scots law, written by a private lawyer at the command of David I.; and though no express confirmation of that treatise by the legislature appears, yet it is admitted to have been the ancient law of our kingdom by express statutes. The borough-laws, which were also enacted by the same king David, and the statutes of William, Alexander II. David II. and the three Roberts, are universally allowed to be genuine. Our parliaments have once and again appointed commissions to revise and amend the *Regiam Majestatem*, and the other ancient books of our law, and to make their report: but, as no report appears to have been made, nor consequently any ratification by parliament, none of these remains are received, as of proper authority, in our courts; yet they are of excellent use in proving and illustrating our most ancient customs.

Acts of fe-  
derunt.

4. Our written law comprehends, (2.) The acts of federunt, which are ordinances for regulating the forms of proceeding before the court of session in the administration of justice, made by the judges, who have a delegated power from the legislature for that purpose. Some of these acts dip upon matter of right, which declare what the judges apprehend to be the law of Scotland, and what they are to observe afterwards as a rule of judgment.

Authority  
of the civil  
and canon  
laws.

5. The civil or Roman and cannon laws, though they are not perhaps to be deemed proper parts of our written law, have undoubtedly had the greatest influence in Scotland. The powers exercised by our sovereigns and judges have been justified upon no other ground, than that they were conformable to the civil

or canon laws; and a special statute was judged necessary, upon the reformation, to rescind such of their constitutions as were repugnant to the Protestant doctrine. From that period, the canon law has been little respected, except in questions of tithes, patronages, and some few more articles of ecclesiastical right; but the Roman continues to have great authority in all cases where it is not derogated from by statute or custom, and where the genius of our law suffers us to apply it.

6. Our unwritten or customary law, is that which, without being expressly enacted by statute, derives its force from the tacit consent of king and people; which consent is presumed from the ancient custom of the community. Custom, as it is equally founded in the will of the lawgiver with written law, has therefore the same effects: hence, as one statute may be explained or repealed by another, so a statute may be explained by the uniform practice of the community, and even go into disuse by a posterior contrary custom. But this power of custom to derogate from prior statutes, is generally confined by lawyers to statutes concerning private right, and does not extend to those which regard public policy.

Customary  
or common  
law.

7. An uniform tract of the judgments or decisions of the court of session, is commonly considered as part of our customary law; and without doubt, where a particular custom is thereby fixed or proved, such custom of itself constitutes law: but decisions, though they bind the parties litigating, have not, in their own nature, the authority of law in similar cases; yet, where they continue uniform, great weight is justly laid on them. Neither can the judgments of the house of peers of Great Britain reach farther than to the parties in the appeal, since in these the peers act as judges, not as lawgivers.

Decisions  
of the session.

8. Though the laws of nature are sufficiently published by the internal suggestion of natural light, civil laws cannot be considered as a rule for the conduct of life, till they are notified to those whose conduct they are to regulate. The *Scots* acts of parliament were, by our most ancient custom, proclaimed in all the different shires, boroughs, and baron-courts, of the kingdom. But after our statutes came to be printed, that custom was gradually neglected; and at last, the publication of our laws, at the market-cross of Edinburgh, was declared sufficient; and they became obligatory forty days thereafter. British statutes are deemed sufficiently notified, without formal promulgation; either because the printing is truly a publication; or because every subject is, by a maxim of the English law, party to

Judgments  
of the house  
of peers.Promulgation  
of laws.



Law of Scotland.

to them, as being present in parliament, either by himself or his representative. After a law is published, no pretence of ignorance can excuse the breach of it.

9. As laws are given for the rule of our conduct, they can regulate future cases only; for past actions, being out of our power, can admit of no rule. Declaratory laws form no exception to this; for a statute, where it is declaratory of a former law, does no more than interpret its meaning; and it is included in the notion of interpretation, that it must draw back to the date of the law interpreted.

Interpretation of laws.

10. By the rules of interpreting statute law received in Scotland, an argument may be used from the title to the act itself, *a rubro ad nigrum*; at least, where the rubric has been either originally framed, or afterwards adopted by the legislature. The preamble or narrative, which recites the inconveniences that had arisen from the former law; and the causes inducing the enactment, may also lead a judge to the general meaning of the statute. But the chief weight is to be laid on the statutory words.

11. Laws, being directed to the unlearned as well as the learned, ought to be construed in their most obvious meaning, and not explained away by subtle distinctions; and no law is to suffer a figurative interpretation, where the proper sense of the words is as commodious, and equally fitted to the subject of the statute. Laws ought to be explained so as to exclude absurdities, and in the sense which appears most agreeable to former laws, to the intention of the lawgiver, and to the general frame and structure of the constitution. In prohibitory laws, where the right of acting is taken from a person, solely for the private advantage of another, the consent of him, in whose behalf the law was made, shall support the act done in breach of it; but the consent of parties immediately interested has no effect in matters which regard the public utility of a state. Where the words of a statute are capable but of one meaning, the statute must be observed, however hard it may bear on particular persons. Nevertheless, as no human system of laws can comprehend all possible cases, more may be sometimes meant by the lawgiver than is expressed; and hence certain statutes, where extension is not plainly excluded, may be extended beyond the letter, to similar and omitted cases: others are to be confined to the statutory words.

Strict.

12. A strict interpretation is to be applied, (1.) To corrective statutes, which repeal or restrict former laws; and to statutes which enact heavy penalties, or restrain the natural liberties of mankind. (2.) Laws, made on occasion of present exigencies in a state, ought not to be drawn to similar cases, after the pressure is over. (3.) Where statutes establish certain solemnities as requisite to deeds, such solemnities are not suppleable by equivalents; for solemnities lose their nature, when they are not performed specifically. (4.) A statute, which enumerates special cases, is, with difficulty, to be extended to cases not expressed; but, where a law does not descend to particulars, there is greater reason to extend it to similar cases. (5.) Statutes, which carry a dispensation or privilege to particular persons or societies, suffer a strict interpretation; because they derogate from the general law, and imply a burden upon the rest of the community. But at no rate can a privilege be explained to the prejudice of those in whose

behalf it was granted. As the only foundation of customary law is usage, which consists in fact, such law can go no farther than the particular usage has gone.

Law of Scotland.

Ample.

13. All statutes, concerning matters specially favoured by law, receive an ample interpretation; as laws for the encouragement of commerce, or of any useful public undertaking, for making effectual the wills of dying persons, for restraining fraud, for the security of creditors, &c. A statute, tho' its subject-matter should not be a favourite of the law, may be extended to similar cases, which did not exist when the statute was made; and for which, therefore, it was not in the lawgiver's power to provide.

14. Every statute, however unfavourable, must receive the interpretation necessary to give it effect: and, on the other hand, in the extension of favourable laws, scope must not be given to the imagination, in discovering remote resemblances; the extension must be limited to the cases immediately similar. Where there is ground to conclude that the legislature has omitted a case out of the statute purposely, the statute cannot be extended to that case, let it be ever so similar to the cases expressed.

15. The objects of the laws of Scotland, according to Mr Erskine, are, Persons, Things, and Actions.

## C H A P. I.

## O F P E R S O N S.

**A**MONG persons, judges, who are invested with jurisdiction, deserve the first consideration.

S E C T. I. *Of jurisdiction and judges in general.*

civi.

Jurisdiction

**JURISDICTION** is a power conferred upon a judge or magistrate, to take cognizance of and decide causes according to law, and to carry his sentences into execution. That tract of ground, or district, within which a judge has the right of jurisdiction, is called his *territory*: and every act of jurisdiction exercised by a judge without his territory, either by pronouncing sentence, or carrying it into execution, is null.

2. The supreme power, which has the right of enacting laws, falls naturally to have the right of erecting courts, and appointing judges, who may apply these laws to particular cases: but, in Scotland, this right has been always intrusted with the crown, as having the executive power of the state.

King the fountain of jurisdiction.

3. Jurisdiction is either supreme, inferior, or mixed. That jurisdiction is supreme, from which there lies no appeal to a higher court. Inferior courts are those whose sentences are subject to the review of the supreme courts, and whose jurisdiction is confined to a particular territory. Mixed jurisdiction participates of the nature both of the supreme and inferior: thus, the judge of the high court of admiralty, and the commissaries of Edinburgh, have an universal jurisdiction over Scotland, and they can review the decrees of inferior admirals and commissaries; but since their own decrees are subject to the review of the courts of session or judiciary, they are, in that respect, inferior courts.

Distinctions of jurisdiction.

4. Jurisdiction is either civil or criminal: by the first, questions of private right are decided; by the other, crimes are punished. But, in all jurisdiction, though merely civil, there is a power inherent in the judge to

punish,

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punish, either corporally, or by a pecuniary fine, those who offend during the proceedings of the court, or who shall afterwards obstruct the execution of the sentence.

5. Jurisdiction is either privative or cumulative. Privative jurisdiction, is that which belongs only to one court, to the exclusion of all others. Cumulative, otherwise called *concurrent*, is that which may be exercised by any one of two or more courts, in the same cause. In civil cumulative jurisdiction, the private pursuer has the right of election before which of the courts he shall sue; but as, in criminal questions which are prosecuted by a public officer of court, a collision of jurisdiction might happen, through each of the judges claiming the exercise of their right, that judge, by whose warrant the delinquent is first cited or apprehended, (which is the first step of jurisdiction), acquires thereby (*jure preventivis*) the exclusive right of judging in the cause.

6. All rights of jurisdiction, being originally granted in consideration of the fitness of the grantee, were therefore personal, and died with himself. But, upon the introduction of the feudal system, certain jurisdictions were annexed to lands, and descended to heirs, as well as the lands to which they were annexed; but now all heritable jurisdictions, except those of admiralty and a small pittance reserved to barons, are either abolished, or resumed and annexed to the crown.

7. Jurisdiction is either proper or delegated. Proper jurisdiction, is that which belongs to a judge or magistrate himself, in virtue of his office. Delegated, is that which is communicated by the judge to another who acts in his name, called a *depute* or *deputy*. Where a deputy appoints one under him, he is called a *substitute*. No grant of jurisdiction, which is an office requiring personal qualifications, can be delegated by the grantee to another, without an express power in the grant.

Civil jurisdiction,  
wherein  
founded.

8. Civil jurisdiction is founded, 1. *Ratione domicilii*, if the defender has his domicile within the judge's territory. A domicile is the dwelling-place where a person lives with an intention to remain; and custom has fixed it as a rule, that residence for 40 days founds jurisdiction. If one has no fixed dwelling-place, e.g. a soldier, or a travelling-merchant, a personal citation against him within the territory is sufficient to found the judge's jurisdiction over him, even in civil questions. As the defender is not obliged to appear before a court to which he is not subject, the pursuer must follow the defender's domicile.

9. It is founded, 2. *Ratione rei sitæ*, if the subject in question lie within the territory. If that subject be immovable, the judge, whose jurisdiction is founded in this way, is the sole judge competent, excluding the judge of the domicile.

Letters of  
supplement

10. Where one, who has not his domicile within the territory, is to be sued before an inferior court *ratione rei sitæ*, the court of session must be applied to, whose jurisdiction is universal, and who, of course, grants letters of supplement to cite the defender to appear before the inferior judge. Where the party to be sued resides in another kingdom, and has an estate in this, the court of session is the only proper court, as the *commune forum* to all persons residing abroad; and the defender, if his estate be heritable, is considered as law-

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fully summoned to that court, by a citation at the market-cross of Edinburgh, and pier and shore of Leith: but where a stranger, not a native of Scotland, has only a moveable estate in this kingdom, he is deemed to be so little subject to the jurisdiction of our courts, that action cannot be brought against him till his effects be first attached by an arrestment *jurisdictionis fundandæ causæ*; which is laid on by a warrant issuing from the supreme courts of session, or admiralty, or from that within whose territory the subject is situated, at the suit of the creditor.

Arrestment  
of strangers.

11. A judge may, in special cases, arrest or secure the persons of such as have neither domicile nor estate within his territory, even for civil debts. Thus, on the border between Scotland and England, warrants are granted of course by the judge-ordinary of either side, against those who have their domicile upon the opposite side, for arresting their persons, till they give caution *judicio fisci*: and even the persons of citizens or natives may be so secured, where there is just reason to suspect that they are in *meditatione fugæ*, i. e. that they intend suddenly to withdraw from the kingdom; upon which suspicion, the creditor who applies for the warrant must make oath. An inhabitant of a borough-royal, who has furnished one who lives without the borough in meat, clothes, or other merchandise, and who has no security for it but his own account-book, may arrest his debtor, till he give security *judicio fisci*.

12. A judge may be declined, i. e. his jurisdiction disowned judicially, 1. *Ratione causæ*, from his incompetency to the special cause brought before him. 2. *Ratione suspecti judicis*; where either the judge himself, or his near kinsman, has an interest in the suit. No judge can vote in the cause of his father, brother, or son, either by consanguinity or affinity; nor in the cause of his uncle or nephew by consanguinity. 3. *Ratione privilegii*; where the party is by privilege exempted from their jurisdiction.

Grounds of  
declinature

13. Prorogated jurisdiction (*jurisdiction in consentienter*) is that which is, by the consent of parties, conferred upon a judge, who, without such consent, would be incompetent. Where a judge is incompetent, every step he takes must be null, till his jurisdiction be made competent by the parties actual submission to it. It is otherwise where the judge is competent, but may be declined by the party upon privilege.

Prorogated  
jurisdiction

14. In order to prorogation, the judge must have jurisdiction, such as may be prorogated. Hence, prorogation cannot be admitted where the judge's jurisdiction is excluded by statute. Yet where the cause is of the same nature with those to which the judge is competent, though law may have confined his jurisdiction within a certain sum, parties may prorogate it above that sum unless where prorogation is prohibited. Prorogation is not admitted in the king's causes; for the interest of the crown cannot be hurt by the negligence of its officers.

15. All judges must at their admission swear, 1. The Oaths of oath of allegiance, and subscribe the assurance; 2. The judges, oath of abjuration; 3. The oath of supremacy; lastly, The oath de *fidei administratione*.

16. A party who has either properly declined the jurisdiction of the judge before whom he had been cited, or who thinks himself aggrieved by any proceedings in the cause, may, before decree, apply to the court

Letters of  
advocation

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of session to issue letters of advocacy for calling the action from before the inferior court to themselves. The grounds therefore, upon which a party may pray for letters of advocacy, are incompetency and iniquity. Under incompetency, is comprehended not only defect of jurisdiction, but all the grounds of declining a jurisdiction, in itself competent, arising either from suspicion of the judge, or privilege in the parties. A judge is said to commit iniquity, when he either delays justice, or pronounces sentence, in the exercise of his jurisdiction, contrary to law.

Advocation how limited.

17. That the court of session may not waste their time in trifles, no cause for a sum below twelve pound Sterling can be advocated to the court of session from the inferior judge competent: but if an inferior judge shall proceed upon a cause to which he is incompetent, the cause may be carried from him by advocacy, let the subject be ever so inconsiderable.

civili.

## SECT. II. *Of the supreme judges and courts of Scotland.*

King,

and

parliament.

1. THE king, who is the fountain of jurisdiction, might by our constitution have judged in all causes, either in his own person, or by those whom he was pleased to vest with jurisdiction.

Parliament of Great Britain.

2. The parliament of Scotland, as our court of the last resort, had the right of reviewing the sentences of all our supreme courts.

3. By the treaty of union, 1707, the parliaments of Scotland and England are united into one parliament of Great Britain. From this period, the British house of peers, as coming in place of the Scots parliament, is become our court of the last resort, to which appeals lie from all the supreme courts of Scotland: but that court has no original jurisdiction in civil matters, in which they judge only upon appeal. By art. 22. of that treaty, the Scots share of the representation in the house of peers is fixed to 16 Scots peers elective; and in the house of commons, to 45 commoners, of which 30 are elected by the freeholders of counties, and 15 by the royal boroughs. The Scots privy council was also thereupon abolished, and sunk into that of Great Britain, which for the future is declared to have no other powers than the English privy council had at the time of the union.

Court of session.

4. A court was erected in 1425, consisting of certain persons to be named by the king, out of the three estates of parliament, which was vested with the jurisdiction formerly lodged in the council, and got the name of the *session*, because it was ordained to hold annually a certain number of sessions at the places to be specially appointed by the king. This court had a jurisdiction, cumulative with the judge ordinary, in spoliations, and other possessory actions, and in debts; but they had no cognisance in questions of property of heritable subjects. No appeal lay from its judgments to the parliament. The judges of this court served by rotation, and were changed from time to time, after having sat 40 days; and became so negligent in the administration of justice, that it was at last thought necessary to transfer the jurisdiction of this court to a council to be named by the king, called the *daily council*.

College of justice.

5. The present model of the court of session, or college of justice, was formed in the reign of James V.

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The judges thereof, who are vested with an universal civil jurisdiction, consisted originally of seven churchmen, seven laymen, and a president, whom it behoved to be a prelate; but spiritual judges were in 1584 partly, and in 1640 totally, prohibited. The judges of session have been always received by warrants from the crown. Anciently his majesty seems to have transferred to the court itself the right of choosing their own president; and in a federer recorded June 26. 1593, the king condescended to present to the lords, upon every vacancy in the bench, a list of three persons, out of which they were to chuse one. But his majesty soon refused the exercise of both rights, which continued with the crown till the usurpation; when it was ordained, that the king should name the judges of the session, by the advice of parliament. After the restoration, the nomination was again declared to be solely in the sovereign.

Judges, by whom named.

6. Though judges may, in the general case, be named at the age of 21 years, the lords of session must be at least 25. No person can be named lord of session, who has not served as an advocate or principal clerk of session for five years, or as a writer to the signet for ten: and in the case of a writer to the signet, he must undergo the ordinary trials upon the Roman law, and be found qualified two years before he can be named. Upon a vacancy in the bench, the king presents the successor by a letter addressed to the lords, wherein he requires them to try and admit the person presented. The powers given to them to reject the pretentee upon trial are taken away, and a bare liberty to remonstrate substituted in its place.

Their qualifications and trial.

7. Besides the 15 ordinary judges, the king was allowed to name three or four lords of his great council, who might sit and vote with them. These extraordinary lords were suppressed in the reign of Geo. I.

8. The appellation of the *college of justice* is not confined to the judges, who are distinguished by the name of *senators*; but comprehends advocates, clerks of session, writers to the signet, and others, as described, *Act S.* 23d Feb. 1687. Where, therefore, the college of justice is intitled to any privilege, it extends to all the members of the college. They are exempted from watching, warding, and other services within borough; and from the payment of minister's stipends, and of all customs, &c. imposed upon goods carried to or from the city of Edinburgh.

Privileges of the college of justice.

9. Though the jurisdiction of the session be properly limited to civil causes, the judges have always sustained themselves as competent to the crime of falsehood. Where the falsehood deserves death or demerabration, they, after finding the crime proved, remit the criminal to the court of judicatory. Special statute has given to the court of session jurisdiction in contraventions of law-burrows, forfeitures, and breach of arrestment; and they have been in use to judge in battery *pendente lite*, and in usury.

Jurisdiction of the session.

9. In certain civil causes, the jurisdiction of the session is exclusive of all inferior jurisdictions; as in declarators of property, and other competitions of heritable rights, provings of the tenor, *cessiones bonorum*, restitution of minors, reductions of decrees or of writings, sales of the estates of minors or bankrupts, &c. In a second class of causes, their jurisdiction can be only exercised in the way of review, after the cause is brought



from the inferior court; as in maritime and consistorial causes, which must be pursued in the first instance before the admiral or commissary; and in actions below twelve pounds Sterling, which must be commenced before the judge-ordinary. In all civil actions, which fall under neither of these classes, the jurisdiction of the session is concurrent, even in the first instance, with that of the judge-ordinary. The session may proceed as a court of equity by the rules of conscience, in abating the rigour of law, and giving aid in proper cases to such as in a court of law can have no remedy: and this power is inherent in the supreme court of every country, where separate courts are not established for law and for equity.

Judiciary  
court.

10. The supreme criminal judge was styled the Judiciary; and he had anciently an universal civil jurisdiction, even in matters of heritage. He was obliged to hold two justice courts or ayres yearly at Edinburgh or Peebles, where all the free-holders of the kingdom were obliged to attend. Besides this universal court, special justice-ayres were held in all the different shires of the kingdom twice in the year. These last having gone into disuse, eight deputies were appointed, two for every quarter of the kingdom, who should make their circuits over the whole in April and October.

11. The office of deputies was suppressed in 1672; and five lords of session were added, as commissioners of Judiciary, to the justice-general and justice-clerk. The justice-general, if present, is constant president of the court, and in his absence the justice-clerk. The kingdom is divided into three districts, and two of the judges are appointed to hold circuits in certain boroughs of each district twice in the year; one judge may proceed to business in the absence of his colleague.

12. By an old statute, the crimes of robbery, rape, murder, and wilful fire-raising, (the four peals of the Crown), are said to be reserved to the King's court of Judiciary; but the only crime in which, *de pravi*, the jurisdiction of Judiciary became at last exclusive of all inferior criminal jurisdiction, was that of high treason. The court of Judiciary, when sitting at Edinburgh, has a power of advocating causes from all inferior criminal judges, and of suspending their sentences.

13. The circuit-court can also judge in all criminal causes which do not infer death or demerement, upon appeal from any inferior court within their district; and has a supreme civil jurisdiction, by way of appeal, in all causes not exceeding twelve pounds Sterling, in which their decrees are not subject to review; but no appeal is to lie to the circuit, till the cause be finally determined in the inferior court.

Court of  
exchequer.

14. The court of Exchequer, as the King's chamberlain court, judged in all questions of the revenue. In pursuance of the treaty of Union, that court was abolished, and a new court erected, consisting of the Lord High Treasurer of Great Britain, and a chief Baron, with four other Barons of Exchequer; which Barons are to be made of sergeants at law, English barristers, or Scots advocates of five years standing. This court has a privative jurisdiction conferred upon it, as to the duties of customs, excise, or other revenues appertaining to the king or prince of Scotland, and as to all honours and estates that may accrue to the crown; in which matters, they are to judge by the forms of pro-

ceeding used in the English court of exchequer, under the following limitations; that no debt due to the crown shall affect the debtor's real estate in any other manner than such estate may be affected by the laws of Scotland, and that the validity of the crown's titles to any honours or lands shall continue to be tried by the court of session. The barons have the powers of the Scots court transferred to them, of passing the accounts of sheriffs, or other officers who have the execution of writs issuing from or returnable to the court of exchequer, and of receiving resignations, and passing signatures of charters, gifts of casualties, &c. But tho' all these must pass in exchequer, it is the court of session only who can judge of their preference after they are completed.

15. The jurisdiction of the admiral in maritime causes was of old concurrent with that of the session. The high-admiral is declared the king's justice-general upon the seas, on fresh water within flood-mark, and in all harbours and creeks. His civil jurisdiction extends to all maritime causes; and so comprehends questions of charter-parties, freights, salvages, bottomries, &c. He exercises this supreme jurisdiction by a delegate, the judge of the high court of admiralty; and he may also name inferior deputies, whose jurisdiction is limited to particular districts, and whose sentences are subject to the review of the high court. In causes which are declared to fall under the admiral's cognizance, his jurisdiction is sole; in so much that the session itself, though it may review his decrees by suspension or reduction, cannot carry a maritime question from him by advocacy. The admiral has acquired, by usage, a jurisdiction in mercantile causes, even where they are not strictly maritime, cumulative with that of the judge-ordinary.

Admiralty  
court.

16. All our supreme courts have seals or signets, proper to their several jurisdictions. The courts of session and judiciary used formerly the same signet, which was called the king's, because the writs issuing from thence run in the king's name; and though the judiciary got at last a separate signet for itself, yet that of the session still retains the appellation of the king's signet. In this office are sealed summonses for citation, letters of executorial diligence, or for staying or prohibiting of diligence, and generally whatever passes by the warrant of the session, and is to be executed by the officers of the court. All these must, before sealing, be signed by the writers or clerks of the signet: But letters of diligence, where they are granted in a depending process, merely for probation, though they pass by the signet, must be subscribed by a clerk of session. The clerks of the signet also prepare and subscribe all signatures of charters, or other royal grants, which pass in exchequer.

Signet.

### SECT. III. *Of the inferior judges and courts of Scotland*

clviii.

SHERIFF, from *reeve*, governor, and *sheer*, to cut or divide, is the judge-ordinary constituted by the crown over a particular division or county. The sheriff's jurisdiction, both civil and criminal, was, in ancient times, nearly as ample within his own territory as that of the supreme courts of session and judiciary was over the whole kingdom.

Sheriff.

2. His civil jurisdiction now extends to all actions upon contracts, or other personal obligations; forthcomings,

comings, poundings of the ground, mails and duties; and to all possessory actions, as removings, ejections, spuilzies, &c.; to all grievances issuing from the chancery, as of inquest, terre, division, tutory, &c.; and even to adjudications of land-estates, when proceeding on the renunciation of the apparent heir. His present criminal jurisdiction extends to certain capital crimes, as theft, and even murder, though it be one of the pleas of the crown; and he is competent to most questions of public police, and has a cumulative jurisdiction with justices of the peace in all riots and breaches of the peace.

3. Sheriffs have a ministerial power, in virtue of which they return juries, in order to the trial of causes that require juries. The writs for electing members of parliament have been, since the union, directed to the sheriffs, who, after they are executed, return them to the crown-office from whence they issued. They also execute writs issuing from the court of exchequer; and in general, take care of all estates, duties, or casualties that fall to the crown within their territory, for which they must account to the exchequer.

Lord of re-  
gality.

4. A lord of regality was a magistrate who had a grant of lands from the sovereign, with royal jurisdiction annexed thereto. His civil jurisdiction was equal to that of a sheriff; his criminal extended to the four pleas of the crown. He had a right to repledge or reclaim all criminals, subject to his jurisdiction, from any other competent court, though it were the judiciary itself, to his own. He had also right, according to the most common opinion, to the single escape of all denounced persons residing within his jurisdiction, even though such privilege had not been expressed in the grant of regality.

Stewart.

5. The steward was the magistrate appointed by the king over such regality lands as happened to fall to the crown by forfeiture, &c. and therefore the steward's jurisdiction was equal to that of a regality. The two stewartries of Kircudbright, and of Orkney and Zetland, make shires or counties by themselves, and send each a representative to parliament.

Bailie.

6. Where lands not erected into a regality fell into the king's hands, he appointed a bailie over them, whose jurisdiction was equal to that of a sheriff.

7. By the late jurisdiction-act, 20 Geo. II. all heritable regalities and baileries, and all such heritable sheriffships and stewartries as were only parts of a shire, are dissolved; and the powers formerly vested in them are made to devolve upon such of the king's courts as these powers would have belonged to if the jurisdictions dissolved had never been granted. All sheriffships and stewartries that were no part of a shire, where they had been granted, either heritably or for life, are resumed and annexed to the crown. No high sheriff or steward can hereafter judge personally in any cause. One sheriff or steward-depute is to be appointed by the king in every shire, who must be an advocate of three years standing; and after a certain term not yet expired, all commissions to these deputies are to be granted for life.

Prince of  
Scotland.

8. The appanage, or patrimony, of the prince of Scotland, has been long erected into a regality-jurisdiction, called the Principality. It is personal to the king's eldest son, upon whose death or succession it returns to the crown. The prince has, or may have, his

own chancery, from which his writs issue, and may name his own chamberlain and other officers for receiving and managing his revenue. The vassals of the prince are intitled to elect, or to be elected, members of parliament for counties, equally with those who hold of the crown.

9. Justices of the peace are magistrates named by the sovereign over the several counties of the kingdom, for the special purpose of preserving the public peace. Anciently their power reached little farther than to bind over disorderly persons for their appearance before the privy council or judiciary; afterwards they were authorized to judge in breaches of the peace, and in most of the laws concerning public policy. They may compel workmen or labourers to serve for a reasonable fee, and they can condemn masters in the wages due to their servants. They have power to judge in questions of highways, and to call out the tenants with their cottars and servants to perform six days work yearly for upholding them.

10. Since the Union, our justices of the peace, over and above the powers committed to them by the laws of Scotland, are authorized to exercise whatever belonged to the office of an English justice of the peace, in relation to the public peace. From that time, the Scots and the English commissions have run in the same style, which contain powers to inquire into and judge in all capital crimes, witchcrafts, felonies, and several others specially enumerated; with this limitation subjoined, *of which justices of the peace may lawfully inquire*. Two justices can constitute a court. Special statute has given the cognizance of several matters of excise to the justices, in which their sentences are final.

11. A borough is a body-corporate, made up of Boroughs the inhabitants of a certain tract of ground erected by the sovereign, with jurisdiction annexed to it. Boroughs are erected, either to be holden of the sovereign himself, which is the general case of royal boroughs; or of the superior of the lands erected, as boroughs of regality and barony. Boroughs royal have power, by their charters, to chuse annually certain office-bearers or magistrates; and in boroughs of regality and barony, the nomination of magistrates is, by their charter, lodged sometimes in the inhabitants, sometimes in the superior. Bailies of boroughs have jurisdiction in matters of debt, services, and questions of possession betwixt the inhabitants. Their criminal jurisdiction extends to petty riots, and reckless fire-raising. The dean of guild is that magistrate of a royal-borough who is head of the merchant-company: he has the cognizance of mercantile causes within borough; and the inspection of buildings, that they encroach neither on private property, nor on the public streets; and he may direct insufficient houses to be pulled down. His jurisdiction has no dependence on the court of the borough, or bailie-court.

12. A baron, in the large sense of that word, is one who holds his lauds immediately of the crown; and, as such, had, by our ancient constitution, right to a seat in parliament, however small his freehold might have been. The lesser barons were exempted from the burden of attending the service of parliament. This exemption grew insensibly into an utter disability in all the lesser barons from sitting in parliament, without election.

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Scotland.Law of  
Scotland.

lection by the county; though no statute is to be found expressly excluding them.

13. To constitute a baron in the strict law-sense, his lands must have been erected, or at least confirmed, by the king, in *liberam baroniam*; and such baron had a certain jurisdiction, both civil and criminal, which he might have exercised, either in his own person, or by his bailie.

14. By the late jurisdiction-act, the civil jurisdiction of a baron is reduced to the power of recovering, from his vassals and tenants, the rents of his lands, and of condemning them in mill-services; and of judging in causes where the debt and damages do not exceed 40 s. Sterling. His criminal jurisdiction is, by the same statute, limited to assaults, batteries, and other smaller offences, which may be punished by a fine not exceeding 20 s. Sterling, or by letting the offender in the stocks in the day-time not above three hours; the fine to be levied by poinding, or one month's imprisonment. The jurisdiction formerly competent to proprietors of mines, and coal or salt-works, over their workmen, is reserved; and also that which was competent to proprietors who had the right of fairs or markets, for correcting the disorders that might happen during their continuance; provided they shall exercise no jurisdiction inferring the loss of life or demeritation.

Constabularies.

15. The high constable of Scotland had no fixed territorial jurisdiction, but followed the court; and had, jointly with the marischal, the cognizance of all crimes committed within two leagues of it. All other constabularies were dependent on him: these had castles, and sometimes boroughs, subject to their jurisdiction, as Dundee, Montrose, &c. and among other powers, now little known, they had the right of exercising criminal jurisdiction within their respective territories during the continuance of fairs. By the late jurisdiction-act, all jurisdictions of constabulary are dissolved, except that of high-constable.

Lyon king  
at arms.

16. The office of the Lyon King of arms was chiefly ministerial, to denounce war, proclaim peace, carry public messages, &c. But he has also a right of jurisdiction, whereby he can punish all who usurp arms contrary to the law of arms, and deprive or suspend messengers, heralds, or pursuivants, (who are officers named by himself); but he has no cognizance of the damage arising to the private party through the messenger's fault. Messengers are subservient to the supreme courts of session and judiciary; and their proper business is to execute all the king's letters either in civil or criminal causes.

Sentence-money.

17. Our judges had, for a long time, no other salaries or appointments than what arose from the sentences they pronounced. Our criminal judges applied to their own use the fines or issues of their several courts; and regalities had a right to the single (sheep of all persons denounced, who resided within their jurisdiction; and our civil judges got a certain proportion of the sum contained in the decree pronounced. But these were all prohibited upon regular salaries being settled upon them.

elix.

#### SECT. V. Of ecclesiastical persons.

The pope.

THE POPE, or bishop of Rome, was long acknowledged, over the western part of Christendom, for the

head of the Christian church. The papal jurisdiction was abolished in Scotland *anno* 1560. The king was, by act 1669, declared to have supreme authority over all persons, and in all causes ecclesiastical; but this act was repealed by 1690, as inconsistent with Presbyterian church-government, which was then upon the point of being established.

Clergy.

2. Before the reformation from Popery, the clergy was divided into secular and regular. The secular had a particular tract of ground given them in charge, within which they exercised the pastoral office of bishop, presbyter, or other church-officer. The regular clergy had no cure of souls; but were tied down to residence in their abbacies, priories, or other monasteries: and they got the name of *regular*, from the rules of mortification to which they were bound, according to the institution of their several orders. Upon the vacancy of any benefice, whether secular or regular, commendators were frequently appointed to levy the fruits, as factors or stewards during the vacancy. The Pope alone could give the higher benefices in *commendam*; and at last, from the plenitude of his power, he came to name commendators for life, and without any obligation to account. After the reformation, several abbacies and priories were given by James VI. in *perpetuam commendam*, to laics.

3. Upon abolishing the Pope's authority, the regular clergy were totally suppressed; and, in place of all the different degrees which distinguished the secular clergy, we had at first only parochial presbyters or ministers, and superintendents, who had the oversight of the church within a certain district: soon thereafter the church-government became episcopal by archbishops, bishops, &c.; and after some intermediate turns, is now presbyterian by kirk-sessions, presbyteries, synods, and general assemblies.

4. Prelate, in our statutes, signifies a bishop, abbot, or other dignified clergyman, who in virtue of his office had a seat in parliament. Every bishop had his chapter, which consisted of a certain number of the ministers of the diocese, by whose assistance he managed the affairs of the church within that district. The nomination of bishops to vacant sees has been in the crown since 1540, though under the appearance of continuing the ancient right of election, which was in the chapter. The confirmation by the crown under the great seal, of the chapter's election, conferred a right to the spirituality of the benefice; and a second grant, upon the consecration of the bishop-elect, gave a title to the temporality; but this second grant fell soon into disuse.

5. He who founded or endowed a church was in- Patrons. titled to the right of patronage thereof, or *advocatio ecclesie*; whereby, among other privileges, he might present a churchman to the cure, in case of a vacancy. The presentee, after he was received into the church, had a right to the benefice *proprio jure*; and if the church was parochial, he was called a *parson*. The Pope claimed the right of patronage of every kirk to which no third party could shew a special title; and, since the reformation, the crown, as coming in place of the Pope, is considered as universal patron, where no right of patronage appears in a subject. Where two churches are united, which had different patrons, each patron presents by turns.

6. Gentle-



Law of  
Scotland.

6. Gentlemen of estates frequently founded colleges or collegiate churches; the head of which got the name of *provost*, under whom were certain prebendaries, or canons, who had their several stalls in the church, where they sung masses. Others of lesser fortunes founded chaplainries, which were donations granted for the singing of masses for deceased friends at particular altars in a church. Though all these were suppressed upon the reformation, their founders continued patrons of the endowments; out of which they were allowed to provide burars, to be educated in any of the universities.

7. Where a fund is gifted for the establishment of a second minister in a parish where the cure is thought too heavy for one, the patronage of such benefice does not belong to the donor, but to him who was patron of the church, unless either where the donor has reserved to himself the right of patronage in the donation, or where he and his successors have been in the constant use of presenting the second minister, without challenge from the patron. The right of presenting incumbents was by 1690, c. 23. taken from patrons, and vested in the heritors and elders of the parish, upon payment to be made by the heritors to the patron of 600 merks; but it was again restored to patrons, 10 An. c. 12. with the exception of the presentations fold in pursuance of the former act.

8. Patrons were not simply administrators of the church; for they held the fruits of the vacant benefice as their own, for some time after the reformation. But that right is now no more than a trust in the patron, who must apply them to pious uses within the parish, at the sight of the heritors, yearly as they fall due. If he fail, he loses his right of administering the vacant stipend for that and the next vacancy. The king, who is exempted from this rule, may apply the vacant stipend of his churches to any pious use, though not within the parish. If one should be ordained to a church, in opposition to the presentee, the patron, whose civil right cannot be affected by any sentence of a church-court, may retain the stipend as vacant. Patrons are to this day intitled to a seat and burial-place in the churches of which they are patrons, and to the right of all the teinds of the parish not heritably disposed.

9. That kirks may not continue too long vacant, the patron must present to the presbytery, (formerly to the bishop), a fit person for supplying the cure, within six months from his knowledge of the vacancy, otherwise the right of presentation accrues to the presbytery *jure devoluto*. Upon presentation by the patron, the bishop collated or conferred the benefice upon the presentee by a writing, in which he appointed certain ministers of the diocese to induce or institute him into the church; which induction completed his right, and was performed by their placing him in the pulpit, and delivering him the bible and keys of the church. The bishop collated to the churches of which himself was patron, *pleno jure*, or without presentation; which he also did in menial churches, whose patronages were sunk, by the churches being appropriated to a judicial act of admission by the presbytery, proceeding either upon a presentation, or upon a call from the heritors and elders, or upon their own *jus devolutum*, completes

the minister's right to the benefice.

10. Soon after the reformation, the Popish churches were prevailed upon to resign in the sovereign's hands, a third of their benefices; which was appropriated, in the first place, for the subsistence of the reformed clergy. To make this fund effectual, particular localities were assigned in every benefice, to the extent of a third, called the *assumption of thirds*; and for the farther support of ministers, Queen Mary made a grant in their favour of all the small benefices not exceeding 300 merks. Bishops, by the act which restored them to the whole of their benefices, were obliged to maintain the ministers within their dioceses, out of the thirds; and in like manner, the laic titulars, who got grants of the teinds, became bound, by their acceptance thereof, to provide the kirks within their erections in competent stipends.

11. But all these expedients for the maintenance of the clergy having proved ineffectual, a commission of parliament was appointed in the reign of James VI. for planting kirks, and modifying stipends to ministers out of the teinds; and afterwards several other commissions were appointed, with the more ample powers of dividing large parishes, erecting new ones, &c. all of which were, in 1707, transferred to the court of session, with this limitation, that no parish should be disjoined, nor new church erected, nor old one removed to a new place, without the consent of three-fourths of the heritors, computing the votes, not by their numbers, but by the valuation of their rents within the parish. The judges of session, when sitting in that court, are considered as a commission of parliament, and have their proper clerks, macers, and other officers of court, as such.

12. The lowest stipend that could be modified to a minister by the first commission, was 500 merks, or five chalders of victual, unless where the whole teinds of the parish did not extend so far: and the highest was 1000 merks, or ten chalders. The parliament 1633 raised the *minimum* to eight chalders of victual, and proportionably in silver; but as neither the commission appointed by that act, nor any of the subsequent ones, was limited as to the *maximum*, the commissioners have been in use to augment stipends considerably above the old *maximum*, where there is sufficiency of free teinds, and the cure is burdensome, or living expensive.

13. Where a certain quantity of stipend is modified to a minister out of the teinds of a parish, without proportioning that stipend among the several heritors, the decree is called a *decree of modification*: but where the commissioners also fix the particular proportions payable by each heritor, it is a decree of *modification and locality*. Where a stipend is only modified, it is secured on the whole teinds of the parish, so that the minister can insist against any one heritor to the full extent of his teinds; such heritor being always entitled to relief against the rest, for what he shall have paid above his just share: but where the stipend is also localised, each heritor is liable in no more than his own proportion.

14. Few of the reformed ministers were, at first, Manse, provided with dwelling-houses; most of the Popish clergy having, upon the first appearance of the reformation, let their manse in feu, or in long tacks: ministers

Law of  
Scotland.Provision  
for the re-  
formed  
clergy.Commis-  
sion for plan-  
ting kirks,  
valuing  
teinds, &c.

Stipends.

Patrons.

Law of Scotland.

Law of Scotland.

nisters therefore got a right, in 1563, to as much of these manes as would serve them, notwithstanding such feus or tacks. Where there was no parson's nor vicar's manse, one was to be built by the heritors, at the sight of the bishop, (now the presbytery), the charge not exceeding L. 1000 Scots, nor below 500 merks. Under a manse are comprehended stable, barn, and byre, with a garden; for all which, it is usual to allow half an acre of ground.

15. Every incumbent is intitled at his entry to have his manse put into good condition; for which purpose, the presbytery may appoint a visitation by tradesmen, and order estimates to be laid before them of the sums necessary for the repairing, which they may proportion among the heritors according to their valuations. The presbytery, after the manse is made sufficient, ought, upon application of the heritors, to declare it a free manse; which lays the incumbent under an obligation to uphold it in good condition during his incumbency, otherwise he or his executors shall be liable in damages, but they are not bound to make up the loss arising from the necessary decay of the building by the waste of time.

Glebe, and 16. All ministers, where there is any landward or country-parish, are, over and above their stipend, intitled to a glebe, which comprehends four acres of arable land, or sixteen fowms of pasture-ground where there is no arable land, (a fowm is what will graze ten sheep or one cow); and is to be designed or marked by the bishop or presbytery out of such kirk-lands within the parish as lie nearest to the kirk, and, in default of kirk-lands, out of temporal lands.

17. A right of relief is competent to the heritors, whose lands are set off for the manse or glebe, against the other heritors of the parish. Manes and glebes, being once regularly designed, cannot be feued or sold by the incumbent in prejudice of his successors, which is in practice extended even to the case where such alienation evidently appears profitable to the benefice.

Grass.

18. Ministers, beside their glebe, are intitled to grafs for a horse and two cows. And, if the lands, out of which the grafs may be designed, either lie at a distance, or are not fit for pasture, the heritors are to pay to the minister L. 20 Scots yearly as an equivalent. Ministers have also freedom of foggage, pasture, fewel, feal, divot, loaning, and free fish and entry, according to use and wont: what these privileges are, must be determined by the local custom of the several parishes.

Terms of payment of stipends.

19. The legal terms at which stipends become due to ministers are Whitunday and Michaelmas. If the incumbent be admitted to his church before Whitunday, till which term the corns are not presumed to be fully sown, he has right to that whole year's stipend; and, if he is received after Whitunday, and before Michaelmas, he is intitled to the half of that year; because, though the corns were sown before his entry, he was admitted before the term at which they are presumed to be reaped. By the same reason, if he dies or is transported before Whitunday, he has right to no part of that year; if before Michaelmas, to the half; and if not till after Michaelmas, to the whole.

Annat or ann.

20. After the minister's death, his executors have right to the annat; which, in the sense of the canon

law, was a right reserved to the Pope, of the first year's fruits of every benefice. Upon a threatened invasion from England anno 1547, the annat was given by our parliament, notwithstanding this right in the Pope, to the executors of such churchmen as should fall in battle in defence of their country: but the word *annat* or *ann*, as it is now understood, is the right which law gives to the executors of ministers, of half a year's benefice over and above what was due to the minister himself for his incumbency.

21. The executors of a minister need make up no title to the ann by confirmation: neither is the right assignable by the minister, or affectable with his debts; for it never belonged to him, but is a mere gratuity given by law to those whom it is presumed the deceased could not sufficiently provide; and law has given it expressly to *executors*: and if it were to be governed by the rules of succession in executory, the widow, in case of no children, would get one half, the other would go to the next of kin; and where there are children, the widow be entitled to a third, and the other two thirds would fall equally among the children. But the court of session, probably led by the general practice, have in this last case divided the ann into two equal parts, of which one goes to the widow, and the other among the children *in capita*.

Jurisdiction of bishops.

22. From the great confidence that was, in the first ages of Christianity, reposed in churchmen, dying persons frequently committed to them the care of their estates, and of their orphan children; but these were simply rights of trust, not of jurisdiction. The clergy soon had the address to establish to themselves a proper jurisdiction, not confined to points of ecclesiastical right, but extending to questions that had no concern with the church. They judged not only in tithes, patronages, testaments, breach of vow, scandal, &c.; but in questions of marriage and divorce, because marriage was a sacrament; in tithes, because these were given in consideration of marriage; in all questions where an oath intervened, on pretence that oaths were a part of religious worship, &c. As churchmen came, by the means of this extensive jurisdiction, to be diverted from their proper functions, they committed the exercise of it to their officials or commissaries: hence the commissary-court was called the *Bishop's Court*, and *Curia Christianitatis*; it was also styled the *Consistorial Court*; from *consistory*, a name first given to the court of appeals of the Roman emperors, and afterwards to the courts of judicature held by churchmen.

23. At the reformation, all episcopal jurisdiction, Commissary exercised under the authority of the bishop of Rome, &c. was abolished. As the course of justice in consistorial causes was thereby stopped, Q. Mary, besides naming a commissary for every diocese, did, by a special grant, establish a new commissary-court at Edinburgh, consisting of four judges or commissaries. This court is vested with a double jurisdiction; one diocesan, which is exercised in the special territory contained in the grant, *viz.* the counties of Edinburgh, Haddington, Linlithgow, Peebles, and a great part of Stirlingshire; and another universal, by which the judges confirm the testaments of all who die in foreign parts, and may reduce the decrees of all inferior commissaries, provided the reduction be pursued within a year after the decree:

crec : bishops, upon their re-establishment in the reign of James VI. were reitor to the right of naming their several commissaries.

24. As the clergy, in times of Popery, assumed a jurisdiction independent of the civil power or any secular court, their sentences could be reviewed only by the Pope, or judges delegated by him; so that, with regard to the courts of Scotland, their jurisdiction was supreme. But, by an act 1560, the appeals from our bishops courts, that were then depending before the Roman consistories, were ordained to be decided by the court of session: and by a posterior act, 1609, the session is declared the king's great consistory, with power to review all sentences pronounced by the commissaries. Nevertheless, since that court had no inherent jurisdiction in consistorial causes prior to this statute, and since the statute gives them a power of judging only by way of advocacy, they have not, to this day, any proper consistorial jurisdiction in the first instance; neither do they pronounce sentence in any consistorial cause brought from the commissaries, but remit it back to them with instructions. By the practice immediately subsequent to the act before quoted, they did not admit advocations from the inferior commissaries, till the cause was first brought before the commissaries of Edinburgh; but that practice is now in disuse.

25. The commissaries retain to this day an exclusive power of judging in declarators of marriage, and of the nullity of marriage; in actions of divorce and of non-adherence, of adultery, bastardy, and confirmation of testaments; because all these matters are still considered to be properly consistorial. Inferior commissaries are not competent to questions of divorce, under which are comprehended questions of bastardy and adherence, when they have a connection with the lawfulness of marriage, or with adultery.

26. Commissaries have now no power to pronounce decrees in absence for any sum above L. 40 Scots, except in causes properly consistorial: but they may authenticate tutorial and curatorial inventories; and all bonds, contracts, &c. which contain a clause for registration in the books of any judge competent, and protests on bills, may be registered in their books.

#### SECT. VI. Of marriage.

PERSONS, when considered in a private capacity, are chiefly distinguished by their mutual relations; as husband and wife, tutor and minor, father and child, master and servant. The relation of husband and wife is constituted by marriage; which is the conjunction of man and wife, vowing to live inseparably till death.

2. Marriage is truly a contract, and so requires the consent of parties. Idiots, therefore, and furious persons, cannot marry. As no person is presumed capable of consent within the years of pupillarity, which, by our law, lasts till the age of 14 in males, and 12 in females, marriage cannot be contracted by pupils; but if the married pair should cohabit after puberty, such acquiescence gives force to the marriage. Marriage is fully perfected by consent; which, without consummation, founds all the conjugal rights and duties. The consent requisite to marriage must be *de presenti*. A promise of marriage, (*spulatio sponsalitia*), may be

refused from, as long as matters are entire; but if any thing be done by one of the parties, whereby a prejudice arises from the non-performance, the party refusing is liable in damages to the other. The canonists, and after them our courts of justice, explain a *copula* subsequent to a promise of marriage into actual marriage.

3. It is not necessary, that marriage should be celebrated by a clergyman. The consent of parties may be declared before any magistrate, or simply before witnesses: and though no formal consent should appear, marriage is presumed from the cohabitation, or living together at bed and board, of a man and woman who are generally reputed husband and wife. One's acknowledgment of his marriage to the midwife whom he called to his wife, and to the minister who baptized his child, was found sufficient presumptive evidence of marriage, without the aid either of cohabitation, or of *habite et repute*. The father's consent was, by the Roman law, essential to the marriage of children in *familia*; but, by our law, children may enter into marriage, without the knowledge, and even against the remonstrances, of a father.

4. Marriage is forbidden within certain degrees of blood. By the law of Moses, *Leviticus* xviii. which is made ours, seconds in blood, and all remoter degrees, may all lawfully marry. By seconds in blood are meant first cousins. Marriage in the direct line is forbidden in *infinitum*; as it is also in the collateral line in the special case where one of the parties is *loco parentis* to the other, as grand-uncle, great grand-uncle, &c. with respect to his grand-niece, &c. The same degrees that are prohibited in consanguinity, are prohibited in affinity; which is the tie arising from marriage, betwixt one of the married pair, and the blood-relations of the other. Marriage also, where either of the parties is naturally unfit for generation, or stands already married to a third person, is *ipso jure* null.

5. To prevent bigamy and incestuous marriages, the church has introduced proclamation of banns; which is the ceremony of publishing the names and designations of those who intend to intermarry, in the churches where the bride and bridegroom reside, after the congregation is assembled for divine service; that all persons who know any objection to the marriage, may offer it. When the order of the church is observed, the marriage is called *regular*; when otherwise, *clandestine*.

6. By marriage, a society is created between the married pair, which draws after it a mutual communion of their civil interests, in as far as is necessary for goods, maintaining it. As the society lasts only for the joint lives of the *socii*; therefore rights that have the nature of a perpetuity, which our law styles *hereditary*, are not brought under the partnership or communion of goods; as a land-estate, or bonds bearing a yearly interest: it is only moveable subjects, or the fruits produced by heritable subjects during the marriage, that become common to man and wife.

7. The husband, as the head of the wife, has the sole right of managing the goods in communion, which is called *jus mariti*. This right is so absolute, that it bears but little resemblance to a right of administering a common subject. For the husband can, in virtue thereof,

Form of  
celebration.

Forbidden  
degrees.

Other  
grounds of  
nullity.

Proclama-  
tion of  
banns.

Communi-  
on of  
goods.

*Jus mariti*.



Law of  
Scotland.

Law of  
Scotland.

thereof, fell, or even gift, at his pleasure, the whole goods falling under communion; and his creditors may affect them for the payment of his proper debts: so that the *jus mariti* carries all the characters of an assignation, by the wife to her husband, of her moveable estate. It arises *ipso jure* from the marriage; and therefore needs no other constitution. But a stranger may convey an estate to a wife, so as it shall not be subject to the husband's administration; or the husband himself may, in the marriage-contract, renounce his *jus mariti* in all or any part of his wife's moveable estate.

Parapher-  
nalia.

8. From this right are excepted paraphernal goods, which, as the word is understood in our law, comprehends the wife's wearing apparel, and the ornaments proper to her person, as necklaces, ear-rings, breast or arm jewels, buckles, &c. These are neither alienable by the husband, nor affectable by his creditors. Things of promiscuous use to husband and wife, as plate, medals, &c. may become paraphernal, by the husband's giving them to the wife, at or before marriage; but they are paraphernal only in regard to that husband who gave them as such, and are esteemed common moveables, if the wife, whose paraphernalia they were, be afterwards married to a second husband; unless he shall in the same manner appropriate them to her.

Burdens af-  
fecting the  
*jus mariti*.

9. The right of the husband to the wife's moveable estate, is burdened by the moveable debts contracted by her before marriage: and as his right is universal, so is his burden; for it reaches to her whole moveable debts, though they should far exceed her moveable estate. Yet the husband is not considered as the true debtor in his wife's debts. In all actions for payment, she is the proper defender: the husband is only cited for his interest, that is, as curator to her, and administrator of the society-goods. As soon therefore as the marriage is dissolved, and the society-goods thereby suffer a division, the husband is no farther concerned in the share belonging to his deceased wife; and consequently is no longer liable to pay her debts, which must be recovered from her representatives, or her separate estate.

How ex-  
tended a-  
gainst the  
husband.

10. This obligation upon the husband is perpetuated against him, (1.) Where his proper estate, real or personal, has been affected, during the marriage, by complete legal diligence; in which case, the husband must, by the common rules of law, relieve his property from the burden with which it stands charged: but the utmost diligence against his person, is not sufficient to perpetuate the obligation; nor even incomplete diligence against his estate. (2.) The husband continues liable, even after the wife's death, in so far as he is *lucratus* or profited by her estate. As he was at no time the proper debtor in his wife's moveable debts; therefore, though he should be *lucratus*, he is, after the dissolution, only liable for them *subsidiarie*, i. e. if her own separate estate is not sufficient to pay them off.

11. Where the wife is debtor in that sort of debt, which, if it had been due to her, would have excluded the *jus mariti*, e. g. in bonds bearing interest, the husband is liable only for the bygone interests, and those that may grow upon the debt during the marriage; because his obligation for her debts must be commensu-

rated to the interest he has in her estate. It is the husband alone who is liable in personal diligence for his wife's debts, while the marriage subsists: the wife, who is the proper debtor, is free from all personal execution upon them while she is *vestita viro*.

12. The husband by marriage becomes the perpetual curator of the wife. From this right it arises, 1. That no suit can proceed against the wife, till the husband be cited for his interest. 2. All deeds, done by a wife without the husband's consent, are null; neither can she sue in any action without the husband's concurrence. Where the husband refuses, or by reason of forfeiture, &c. cannot concur; or where the action is to be brought against the husband himself, for performing his part of the marriage-articles; the judge will authorise her to sue in her own name. The effects arising from this curatorial power discover themselves even before marriage, upon the publication of banns; after which the bride, being no longer *sui juris*, can contract no debt, nor do any deed, either to the prejudice of her future husband, nor even to her own.

13. If the husband should either withdraw from his wife, or turn her out of doors; or if, continuing in family with her, he should by severe treatment endanger her life; the commissaries will authorise a separation *a mensa et thoro*, and give a separate alimony to the wife, suitable to her husband's estate, from the time of such separation, until either a reconciliation or a sentence of divorce.

Separate  
alimony.

14. Certain obligations of the wife are valid, notwithstanding her being *sub cura mariti*; ex. gr. obligations arising from delict; for wives have no privilege to commit crimes. But if the punishment resolves into a pecuniary mulct, the execution of it must, from her incapacity to fulfil, be suspended till the dissolution of the marriage, unless the wife has a separate estate exempted from the *jus mariti*.

What obli-  
gations of  
the wife va-  
lid.

15. Obligations arising from contract, affect either the person or the estate. The law has been so careful to protect wives while *sub cura mariti*, that all personal obligations granted by a wife, though with the husband's consent, as bonds, bills, &c. are null; with the following exceptions: (1.) Where the wife gets a separate *peculium* or stock, either from her father or a stranger, for her own or her children's alimony, she may grant personal obligations in relation to such stock; but by stronger reason, personal obligations granted by a wife are good, when her person is actually withdrawn from the husband's power by a judicial separation. (2.) A wife's personal obligation, granted in the form of a deed *inter vivos*, is valid, if it is not to take effect till her death. (3.) Where the wife is by the husband *præposita negotiis*, intrusted with the management, either of a particular branch of business, or of his whole affairs, all the contracts she enters into in the exercise of her *præpositura* are effectual, even though they be not reduced to writing, but should arise merely *ex re*, from furnishings made to her: but such obligations have no force against the wife; it is the husband only, by whose commission she acts, who is thereby obliged.

16. A wife, while she remains in family with her husband, is considered as *præposita negotiis domesticis*: and consequently may provide things proper for the family;

Law of  
Scotland.Inhibition  
against a  
wife.Rights af-  
fecting her  
estate.Donations,  
revocable  
and irrev-  
ocable.Ratification  
by wives.Law of  
Scotland.Dissolution  
of mar-  
riage.

mony; for the price whereof the husband is liable, tho' they should be misapplied, or though the husband should have given her money to provide them elsewhere. A husband who suspects that his wife may hurt his fortune by high living, may use the remedy of inhibition against her; by which all persons are intercluded from contracting with her, or giving her credit. After the completing of this diligence, whereby the *praesumptura* falls, the wife cannot bind the husband, unless for such reasonable furnishings as he cannot instruct that he provided her with *alimunde*. As every man, and consequently every husband, has a right to remove his managers at pleasure, inhibition may pass at the suit of the husband against the wife, though he should not offer to justify that measure by an actual proof of the extravagance or profusion of her temper.

17. As to rights granted by the wife affecting her estate; she has no moveable estate, except her *paraphernalia*; and these she may alien or impignorate, with consent of the husband. She can, without the husband, bequeath by testament her share of the goods in communion; but she cannot dispose of them *inter vivos*. A wife can lawfully oblige herself, in relation to her heritable estate, with consent of her husband: for though her person is in some sense sunk by the marriage, she continues capable of holding a real estate; and in such obligations, her estate is considered, and not her person. A husband, though he be curator to his wife, can, by his acceptance or intervention, authorise rights granted by her in his own favour: for a husband's curatory is not intended only for the wife's advantage, but is considered as a mutual benefit to both.

18. All donations, whether by the wife to the husband, or by the husband to the wife, are revocable by the donor; but if the donor dies without revocation, the right becomes absolute. Where the donation is not pure, it is not subject to revocation: thus, a grant made by the husband, in consequence of the natural obligation that lies upon him to provide for his wife, is not revocable, unless in so far as it exceeds the measure of a rational settlement; neither are remuneratory grants revocable, where mutual grants are made in consideration of each other, except where an onerous cause is simulated, or where what is given *hinc inde* bears no proportion to each other. All voluntary contracts of separation, by which the wife is provided in an yearly alimony, are effectual as to the time past, but revocable either by the husband or wife.

19. As wives are in the strongest degree subject to the influence of their husbands, third parties, in whose favours they had made grants, were frequently vexed with actions of reduction, as if the grant had been extorted from the wife through the force or fear of the husband. To secure the grantees against this danger, ratifications were introduced, whereby the wife, appearing before a judge, declares upon oath, her husband not present, that she was not induced to grant the deed *ex vi aut metu*. A wife's ratification is not absolutely necessary for securing the grantee: law indeed allows the wife to bring reduction of any deed she has not ratified, upon the head of force or fear; of which, if she brings sufficient evidence, the deed will be set aside; but if she fails in the proof, it will remain effectual to the receiver.

20. Marriage, like other contracts, might, by the Roman law, be dissolved by the contrary consent of parties; but, by the law of Scotland, it cannot be dissolved till death, except by divorce, proceeding either upon the head of adultery, or of wilful desertion.

21. Marriage is dissolved by death, either within year and day from its being contracted, or after year and day. If it is dissolved within year and day, all rights granted in consideration of the marriage (unless guarded against in the contract) become void, and things return to the same condition in which they stood before the marriage: with this restriction, that the husband is considered as a *bona fide* possessor, in relation to what he has consumed upon the faith of his right; but he is liable to repay the tocher, without any deduction in consideration of his family-expence during the marriage. If things cannot be restored on both sides, equity hinders the restoring of one party, and not the other.

22. Upon the dissolution of a marriage, after year and day, the surviving husband becomes the irrevocable proprietor of the tocher; and the wife, where she survives, is intitled to her jointure, or to her legal provisions. She has also right to mournings, suitable to the husband's quality; and to alimony from the day of his death, till the term at which her life rent provision, either legal or conventional, commences. If a living child be procreated of the marriage, the marriage has the same effect as if it had subsisted beyond the year. A day is adjoined to the year, *in majorem evidentiam*, that it may clearly appear that the year itself is elapsed; and therefore, the running of any part of the day, after the year, has the same effect as if the whole were elapsed. The legal right of courtesy competent to the surviving husband is explained below, No clxx. 28.

23. Divorce is such a separation of married persons, during their lives, as looses them from the nuptial tie, and leaves them at freedom to intermarry with others. But neither adultery, nor wilful desertion, are grounds which must necessarily dissolve marriage; they are only handles, which the injured party may take hold of to be free. Cohabitation, therefore, by the injured party, after being in the knowledge of the acts of adultery, implies a passing from the injury; and no divorce can proceed, which is carried on by collusion betwixt the parties, left, contrary to the first institution of marriage, they might disengage themselves by their own consent: and though, after divorce, the guilty person, as well as the innocent, may contract second marriages; yet, in the case of divorce upon adultery, marriage is by special statute prohibited betwixt the two adulterers.

24. Where either party has deserted from the other for four years together, that other may sue for adherence. If this has no effect, the church is to proceed, first by admonition, then by excommunication; all which previous steps are declared to be a sufficient ground for pursuing a divorce. *De praxi*, the commissaries pronounce sentence in the adherence, after one year's desertion; but four years must intervene between the first desertion and the decree of divorce.

25. The legal effects of divorce on the head of desertion are, that the offending husband shall restore the tocher, and forfeit to the wife all her provisions, legal

Law of Scotland.

Law of Scotland.

Judicial factor.

Curators.

Who de- barred from tutory and curatory.

Difference between tutory and curatory.

and, conventional; and on the other hand, the offending wife shall forfeit to the husband her tocher, and all the rights that would have belonged to her in the case of her surivance. This was also esteemed the rule in divorces upon adultery. But by a decision of the court of session 1662, founded on a tract of ancient decisions recovered from the records, the offending husband was allowed to retain the tocher.

clxi. SECT. VII. *Of Minors, and their tutors and curators.*

Pupilarity, &amp;c.

1. THE stages of life principally distinguished in law are, *pupilarity, puberty or minority, and majority*. A child is under pupilarity, from the birth to 14 years of age if a male, and till 12 if a female. Minority begins where pupilarity ends, and continues till majority; which, by the law of Scotland, is the age of 21 years complete, both in males and females: but minority, in a large sense, includes all under age, whether pupils or *puberes*. Because pupils cannot in any degree act for themselves, and minors seldom with discretion, pupils are put by law under the power of tutors, and minors may put themselves under the direction of curators. Tutory is a power and faculty to govern the person, and administer the estate, of a pupil. Tutors are either nominate, of law, or dative.

Tutors.

2. A tutor nominate is he who is named by a father, in his testament or other writing, to a lawful child. Such tutor is not obliged to give caution for the faithful discharge of his office; because his fidelity is presumed to have been sufficiently known to the father.

3. If there be no nomination by the father, or if the tutors nominate do not accept, or if the nomination falls by death or otherwise, there is place for a tutor of law. This sort of tutory devolves upon the next agnate; by which we understand he who is nearest related by the father, though females intervene.

Agnates.

4. Where there are two or more agnates equally near to the pupil, he who is intitled to the pupil's legal succession falls to be preferred to the others. But as the law suspects, that he may not be over careful to preserve a life which stands in the way of his own interest, this sort of tutor is excluded from the custody of the pupil's person; which is commonly committed to the mother, while a widow, until the pupil be seven years old; and, in default of the mother, to the next cognate, *i. e.* the nearest relation by the mother. The tutor of law must be at least 25 years of age. He is served or declared by a jury of sworn men, who are called upon a brief issuing from the chancery, which is directed to any judge having jurisdiction. He must give security before he enters upon the management.

5. If no tutor of law demands the office, any person, even a stranger, may apply for a tutory-dative. But because a tutor in law ought to be allowed a competent time to deliberate whether he will serve or not, no tutory-dative can be given till the elapsing of a year from the time at which the tutor of law had first a right to serve. It is the king alone, as the father of his country, who gives tutors-dative, by his court of exchequer; and no gift of tutory can pass in exchequer, without the citation or consent of the next of kin to the pupil, both by the father and mother, nor till the tutor give security, recorded in the books of exchequer. There is no room for a tutor of law, or

tutory-dative, while a tutor-nominate can be hoped for: and tutors of law, or dative, even after they have begun to act, may be excluded by the tutor-nominate, as soon as he offers to accept, unless he has expressly renounced the office. If a pupil be without tutors of any kind, the court of session will, at the suit of any kinsman, name a factor (Reward) for the management of the pupil's estate.

6. After the years of pupilarity are over, the minor is considered as capable of acting by himself, if he has confidence enough of his own capacity and prudence. The only two cases in which curators are imposed upon minors are, (1.) Where they are named by the father, in a state of health. (2.) Where the father is himself alive; for a father is *ipso jure*, without any service, administrator, that is, both tutor and curator of law, to his children, in relation to whatever estate may fall to them during their minority. This right in the father does not extend to grandchildren, nor to such even of his immediate children as are forisfiliated. Neither has it place in subjects which are left by a stranger to the minor, exclusive of the father's administration. If the minor chuses to be under the direction of the curators, he must raise and execute a summons, citing at least two of his next of kin to appear before his own judge-ordinary, upon nine days warning. At the day and place of appearance, he offers to the judge a list of those whom he intends for his curators: such of them as resolve to undertake the office, must sign their acceptance, and give caution; upon which an act of curatory is extracted.

7. These curators are styled *ad negotia*; to distinguish them from another sort called *curators ad litem*, who are authorized by the judge to concur with a pupil or minor in actions of law, either where he is without tutors and curators, or where his tutors and curators are parties to the suit. This sort is obliged to give caution, because they have no intermeddling with the minor's estate: they are appointed for a special purpose; and when that is over, their office is at an end. Women are capable of being tutors and curators, under the following restrictions: (1.) The office of a female tutor or curator falls by her marriage, even though the nomination should provide otherwise; (2.) No woman can be tutor of law. Pupils are declared incapable of tutory or curatory. Where the minor has more tutors and curators than one, who are called in the nomination to the joint management, they must all concur in every act of administration: where a certain number is named for a quorum, that number must concur: where any one is named *sine quo non*, no act is valid without that one's special concurrence. But if they are named without any of these limitations, the concurrence of the majority of the nominees then alive is sufficient.

8. In this, tutory differs from curatory, that as pupils are incapable of consent, they have no person capable of acting; which defect the tutor supplies: but a minor *pubes* can act for himself. Hence, the tutor subscribes alone all deeds of administration: but in curatory, it is the minor who subscribes as the proper party; the curator does no more than consent. Hence also, the persons of pupils are under the power either of their tutors or of their nearest cognates; but the minor, after pupilarity, has the disposal of his own person, and may reside where he pleases. In most other

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Judicial inventories.

particulars, the nature, the powers, and the duties of the two offices coincide. Both tutors and curators must, previous to their administration, make a judicial inventory, subscribed by them and the next of kin, before the minor's judge-ordinary, of his whole estate personal and real; of which, one subscribed duplicate is to be kept by the tutors or curators themselves; another, by the next of kin on the father's side; and a third, by the next of kin on the mother's. If any estate belonging to the minor shall afterwards come to their knowledge, they must add it to the inventory within two months after their attaining possession thereof. Should they neglect this, the minor's debtors are not obliged to make payment to them: they may be removed from their offices as suspected; and they are entitled to no allowance for the sums disbursed by them in the minor's affairs, except the expense laid out upon the minor's entertainment, upon his lauds and houses, and upon completing his titles.

Powers of tutors and curators.

9. Tutors and curators cannot grant leases of the minor's lands, to endure longer than their own office; nor under the former rental, without either a warrant from the court of session, or some apparent necessity.

10. They have power to sell the minor's moveables; but cannot sell their pupil's land-estate, without the authority of a judge. But the alienation of heritage by a minor, with consent of his curators, is valid.

11. Tutors and curators cannot, contrary to the nature of their trust, authorise the minor to do any deed for their own benefit; nor can they acquire any debt affecting the minor's estate; and, where a tutor or curator makes such acquisition, in his own name, for a less sum than the right is intitled to draw, the benefit thereof accrues to the minor.

Their obligations.

12. By the Roman law, tutory and curatory, being *munera publica*, might be forced upon every one who has not a relevant ground of excuse; but, with us, the persons named to these offices may either accept or decline: and where a father, in *liege pouste*, names certain persons both as tutors and curators to his children, though they have acted as tutors, they may decline the office of curatory. Tutors and curators having once accepted, are liable *in diligence*, that is, are accountable for the consequences of their neglect in any part of their duty from the time of their acceptance. They are accountable *singuli in solidum*, i. e. every one of them is answerable, not only for his own diligence, but for that of his co-tutors; and any one may be sued without citing the rest: but he who is condemned in the whole, has action of relief against his co-tutors.

13. From this obligation to diligence, we may except, (1.) Fathers or administrators in law, who, from the presumption that they act to the best of their power for their children, are liable only for actual intromissions. (2.) Tutors and curators named by the father, with the special provisos, that they shall be liable barely for intromissions, not for omissions; and that each of them shall be liable only for himself, and not *in solidum* for the co-tutors: but this power of exemption from diligence, is limited to the estate descending from the father himself. Tutors or curators are not intitled to any salary or allowance for pains, unless a salary has been expressly contained in the testator's nomination; for their office is presumed gratuitous.

14. Though no person is obliged to accept the of-

fice of tutor or curator; yet having once accepted, he cannot throw it up or renounce it without sufficient cause; but, if he should be guilty of misapplying the minor's money, or fail in any other part of his duty, he may be removed at the suit of the minor's next in kin, or by a co-tutor or co-curator. Where the misconduct proceeds merely from indolence or inattention, the court, in place of removing the tutor, either join a curator with him, or, if he be a tutor-nominate, they oblige him to give caution for his past and future management.

15. The offices of tutory and curatory expire also by the pupil's attaining the age of puberty, or the minor's attaining the age of 21 years complete; and by the death either of the minor, or of his tutor and curator.

16. Deeds either by pupils, or by minors having curators without their consent, are null; but they oblige the granters, in as far as relates to sums profitably applied to their use. A minor under curators can indeed make a testament by himself; but whatever is executed in the form of a deed *inter vivos*, requires the curator's consent. Deeds by a minor who has no curators, are as effectual as if he had had curators, and signed them with their consent; he may even alien his heritage, without the interposition of a judge.

Effect of deeds by minors.

17. Minors may be restored against all deeds granted in their minority, that are hurtful to them. Deeds, in themselves void, need not the remedy of restitution; but where hurtful deeds are granted by a tutor in his pupil's affairs, or by a minor who has no curators, as these deeds subsist in law, restitution is necessary: and even where a minor, having curators, executes a deed hurtful to himself with their consent, he has not only action against the curators, but he has the benefit of restitution against the deed itself. The minor cannot be restored, if he does not raise and execute a summons for reducing the deed, *ex capite minorrennitatis et lesionis*, before he be 25 years old. These four years, between the age of 21 and 25, called *quadrannium utile*, are indulged to the minor, that he may have a reasonable time, from that period, when he is first presumed to have the perfect use of his reason, to consider with himself what deeds done in his minority have been truly prejudicial to him.

Restitution.

18. Questions of restitution are proper to the court of session. Two things must be proved by the minor, in order to the reduction of the deed: (1.) That he was minor when it was signed; (2.) That he is hurt or lesed by the deed. This lesion must not proceed merely from accident; for the privilege of restitution was not intended to exempt minors from the common misfortunes of life; it must be owing to the imprudence or negligence of the minor, or his curator.

19. A minor cannot be restored against his own defect or fraud. (2.) Restitution is excluded, if the minor, at any time after majority, has approved of the deed, either by a formal ratification, or tacitly by payment of interest, or by other acts inferring approbation. (3.) A minor, who has taken himself to business, as a merchant-shopkeeper, &c. cannot be restored against any deed granted by him in the course of that business, especially if he was *proximus majorrennitatis* at signing the deed. (4.) According to the more common opinion, a minor cannot be restored in a question against a minor, unless some gross unfairness shall be qualified.

How excluded.

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How transferred to the heir.

qualified in the bargain.

20. The privilege of restitution does not always die with the minor himself. (1.) If a minor succeeds to a minor, the time allowed for restitution is governed by the minority of the heir, not of the ancestor. (2.) If a minor succeeds to a major, who was not full 25, the privilege continues with the heir during his minority; but he cannot avail himself of the *anni utiles*, except in so far as they were unexpired at the ancestor's death. (3.) If a major succeeds to a minor, he has only the *quadrimum utile* after the minor's death; and if he succeeds to a major dying within the *quadrimum*, no more of it can be profitable to him than what remained when the ancestor died.

Minor non tenetur placari.

21. No minor can be compelled to state himself as a defender, in any action, whereby his heritable estate flowing from ascendants may be evicted from him, by one pretending a preferable right.

22. This privilege is intended merely to save minors from the necessity of disputing upon questions of preference. It does not therefore take place, (1.) Where the action is pursued on the father's falsehood or delict. (2.) Upon his obligation to convey heritage. (3.) On his liquid bond for a sum of money, though such action should have the effect to carry off the minor's estate by adjudication. (4.) Nor in actions pursued by the minor's superior, upon feudal casualties. (5.) This privilege cannot be pleaded in bar of an action which had been first brought against the father, and is only continued against the minor; nor where the father was not in the peaceable possession of the heritable subject at his death. Before the minor can plead it, he must be served heir to his father. The persons of pupils are protected from imprisonment on civil debts.

Curators of idiots and furious persons.

23. Curators are given, not only to minors, but in general to every one who, either through defect of judgment, or unfitness of disposition, is incapable of rightly managing his own affairs. Of the first sort, are idiots and furious persons. Idiots, or *fatui*, are entirely deprived of the faculty of reason. The distemper of the furious person does not consist in the defect of reason; but in an overheated imagination, which obstructs the application of reason to the purposes of life. Curators may be also granted to lunatics; and even to persons dumb and deaf, though they are of sound judgment, where it appears that they cannot exert it in the management of business. Every person, who is come of age, and is capable of acting rationally, has a natural right to conduct his own affairs. The only regular way, therefore, of appointing this sort of curators, is by a jury summoned upon a brief from the chancery; which is not, like the brief of common tutory, directed to any judge-ordinary, but to the judge of the special territory where the person alleged to be fatuous or furious resides; that, if he is truly of sound judgment, he may have an opportunity to oppose it: and, for this reason, he ought to be made a party to the brief. The curatory of idiots and furious persons belongs to the nearest agnate; but a father is preferred to the curatory of his fatuous son, and the husband to that of his fatuous wife, before the agnate.

24. A clause is inserted in the brief, for inquiring how long the fatuous or furious person has been in that condition; and the verdict to be pronounced by the inquest, is declared a sufficient ground, without farther

evidence, for reducing all deeds granted after the period at which it appeared by the proof that the fatuity or fury had begun. But, as fatuous and furious persons are, by their very state, incapable of being obliged, all deeds done by them may be declared void, upon proper evidence of their fatuity at the time of signing, though they should never have been cognosed idiots by an inquest.

25. We have some few instances of the sovereign's giving curators to idiots, where the next agnate did not claim; but such gifts are truly deviations from our law, since they pass without any inquiry into the state of the person upon whom the curatory is imposed. Hence the curator of law to an idiot, serving *quandocunque*, is preferred, as soon as he offers himself, before the curator-dative. This sort of curatory does not determine by the lucid intervals of the person *sub cura*; but it expires by his death, or perfect return to a sound judgment; which last ought regularly to be declared by the sentence of a judge.

26. Persons, let them be ever so profuse, or liable to be imposed upon, if they have the exercise of reason, can effectually oblige themselves, till they are fettered by law. Interdiction is a legal restraint laid upon such persons from signing any deed to their own prejudice, without the consent of their curators or interdictors.

27. There could be no interdiction, by our ancient practice, without a previous inquiry into the person's condition. But as there were few who could bear the shame that attends judicial interdiction, however necessary the restraint might have been, voluntary interdiction has received the countenance of law; which is generally executed in the form of a bond, whereby the grantor obliges himself to do no deed that may affect his estate, without the consent of certain friends therein mentioned. Though the reasons inductive of the bond should be but gently touched in the recital, the interdiction stands good. Voluntary interdiction, tho' it be imposed by the sole act of the person interdicted, cannot be recalled at his pleasure: but it may be taken off, (1.) By a sentence of the court of session, declaring, either that there was, from the beginning, no sufficient ground for the restraint; or that the party is, since the date of the bond, become *rei sui providus*. (2.) It falls, even without the authority of the lords, by the joint act of the person interdicted, and his interdictors, concurring to take it off. (3.) Where the bond of interdiction requires a certain number as a quorum, the restraint ceases, if the interdictors shall be by death reduced to a lesser number.

28. Judicial interdiction is imposed by a sentence of the court of session. It commonly proceeds on an action brought by a near kinsman to the party; and sometimes from the *nobile officium* of the court, when they perceive, during the pendency of a suit, that any of the litigants is, from the facility of his temper, subject to imposition. This sort must be taken off by the authority of the same court that imposed it.

29. An interdiction need not be served against the person interdicted; but it must be executed, or published by a messenger, at the market-cross of the jurisdiction where he resides, by publicly reading the interdiction there, after three oyeses made for convocation the lieges. A copy of this execution must be affixed to the crosses; and thereafter, the interdiction, with

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its execution, must be registered in the books, both of the jurisdiction where the person interdicted resides and where his lands lie, or in the general register of the session, within 40 days from the publication. An interdiction, before it is registered, has no effect against third parties, tho' they should be in the private knowledge of it; but it operates against the interdictors themselves, as soon as it is delivered to them.

30. An interdiction, duly registered, has this effect, that all deeds done thereafter, by the persons interdicted, without the consent of his interdictors, affecting his heritable estate, are subject to reduction. Registration in the general register secures all his lands from alienation, wherever they lie; but where the interdiction is recorded in the register of a particular shire, it covers no lands except those situated in that shire. But persons interdicted have full power to dispose of their moveables, not only by testament, but by present deeds of alienation: And creditors, in personal bonds granted after interdiction, may use all execution against their debtor's person and moveable estate: such bonds being only subject to reduction in so far as diligence against the heritable estate may proceed upon them.

31. All onerous or rational deeds granted by the person interdicted, are as effectual, even without the consent of the interdictors, as if the granter had been laid under no restraint; but he cannot alter the succession of his heritable estate, by any settlement, let it be ever so rational. No deed, granted with consent of the interdictors, is reducible, though the strongest lesion or prejudice to the granter should appear: the only remedy competent, in such case, is an action by the granter against his interdictors, for making up to him what he has lost through their undue consent. It is no part of the duty of interdictors, to receive sums or manage any estate; they are given merely *ad auctoritatem prestandam*, to interpose their authority to reasonable deeds: and so are accountable for nothing but their fraud or fault, in consenting to deeds hurtful to the person under their care.

32. The law concerning the state of children falls next to be explained. Children are either born in wedlock, or out of it. All children, born in lawful marriage or wedlock, are presumed to be begotten by the person to whom the mother is married; and consequently to be lawful children. This presumption is so strongly founded, that it cannot be defeated but by direct evidence that the mother's husband could not be the father of the child, *e. g.* where he is impotent, or was absent from the wife till within six lunar months of the birth. The canonists indeed maintain, that the concurring testimony of the husband and wife that the child was not procreated by the husband, is sufficient to elide this legal presumption for legitimacy: but it is an agreed point, that no regard is to be paid to such testimony, if it be made after they have owned the child to be theirs. A father has the absolute right of disposing of his children's person, of directing their education, and of moderate chastisement; and even after they become *puberes*, he may compel them to live in family with him, and to contribute their labour and industry, while they continue there, towards his service. A child who gets a separate stock from the father for carrying on any trade or employment, even though he

should continue in the father's house, may be said to be emancipated or forisfamiliarized, in so far as concerns that stock; for the profits arising from it are his own. Forisfamiliarization, when taken in this sense, is also inferred by the child's marriage, or by his living in a separate house, with his father's permission or good-will. Children, after their full age of twenty-one years, become, according to the general opinion, their own masters; and from that period are bound to the father only by the natural ties of duty, affection, and gratitude. The mutual obligations between parents and children to maintain each other, are explained afterwards, N<sup>o</sup> clxxiii. 4.

Ballards.

33. Children born out of wedlock, are styled natural children, or ballards. Ballards may be legitimated or made lawful, either, (1.) By the subsequent intermarriage of the mother of the child with the father. And this sort of legitimation intitles the child to all the rights of lawful children. The subsequent marriage, which produces legitimation, is considered by the law to have been entered into when the child legitimated was begotten: and hence, if he be a male, he excludes, by his right of primogeniture, the sons procreated after the marriage, from the succession of the father's heritage, though these sons were lawful children from the birth. Hence, also, those children only can be thus legitimated, who are begotten of a woman whom the father might at that period have lawfully married. (2.) Ballards are legitimated by letters of legitimation from the sovereign. N<sup>o</sup> clxxiii. 3.

Servants.

34. As to the power of masters over their servants: All servants now enjoy the same rights and privileges with other subjects, unless in so far as they are tied down by their engagements of service. Servants are either necessary or voluntary. Necessary are those whom law obliges to work without wages, of whom immediately. Voluntary servants engage without compulsion, either for mere subsistence, or also for wages. Those who earn their bread in this way, if they should stand off from engaging, may be compelled to it by the justices of the peace, who have power to fix the rate of their wages.

Colliers and salters.

35. Colliers, coal-bearers, and salters, and other persons necessary to collieries and saltworks, as they are particularly described by act 1661, were formerly tied down to perpetual service at the works to which they had once entered. Upon a sale of the works, the right of their service was transferred to the new proprietor. All persons were prohibited to receive them into their service, without a testimonial from their last master; and if they deserted to another work, and were redemanded within a year thereafter, he who had received them was obliged to return them within twenty-four hours, under a penalty. But though the proprietor should neglect to require the deserter within the year, he did not, by that short prescription, lose his property in him. Colliers, &c. where the colliery to which they were restricted was either given up, or not sufficient for their maintenance, might lawfully engage with others; but if that work should be again set a-going, the proprietor might reclaim them back to it.

Restraints lately taken off.

36. By 15 Geo. III. c. 28. these restraints, the only remaining vestiges of slavery in the law of Scotland, are abrogated; and, after the 1st July 1775, all colliers, coal-bearers, and salters, are declared to be upon the



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the same footing with other servants or labourers. The act subjects those who were bound prior to the 1st July 1775, to a certain number of years service for their freedom, according to the age of the person.

The poor.

37. The poor make the lowest class or order of persons. Indigent children may be compelled to serve any of the king's subjects without wages, till their age of thirty years. Vagrants and sturdy beggars may be also compelled to serve any manufacturer. And because few persons were willing to receive them into their service, public work-houses are ordained to be built for setting them to work. The poor who cannot work, must be maintained by the parishes in which they were born; and where the place of their nativity is not known, that burden falls upon the parishes where they have had their most common resort, for the three years immediately preceding their being apprehended or their applying for the public charity. Where the contributions collected at the churches to which they belong, are not sufficient for their maintenance, they are to receive badges from the minister and kirk-session, in virtue of which they may ask alms at the dwelling-houses of the inhabitants of the parish.

## C H A P. II.

### OF THINGS.

THE things, or subjects, to which persons have right, are the second object of law.

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SECT. I. *Of the division of rights, and the several ways by which a right may be acquired.*

Property.

THE right of enjoying and disposing of a subject at one's pleasure, is called property. Proprietors are restrained by law from using their property emulouly to their neighbour's prejudice. Every state or sovereign has a power over private property, called, by some lawyers, *dominium eminens*, in virtue of which, the proprietor may be compelled to sell his property for an adequate price, where an evident utility on the part of the public demands it.

Things incapable of appropriation.

2. Certain things are by nature itself incapable of appropriation; as the air, the light, the ocean, &c.: none of which can be brought under the power of any one person, though their use be common to all. Others are by law exempted from private commerce, in respect of the uses to which they are destined. Of this last kind are, (1.) *Res publicæ*, as navigable rivers, highways, bridges, &c.: the right of these is vested in the king, chiefly for the benefit of his people, and they are called *regalia*. (2.) *Res universitatis*, things which belong in property to a particular corporation or society, and whose use is common to every individual in it, but both property and use are subject to the regulations of the society; as town-houses, corporation-halls, market-places, church-yards, &c. The lands or other revenue belonging to a corporation do not fall under this class, but are *juris privati*.

Ways of acquiring property.

3. Property may be acquired, either by occupation or accession; and transferred by tradition or prescription: but prescription, being also a way of losing property, falls to be explained under a separate title. Occupation, or occupancy, is the appropriating of things which have no owner, by apprehending them, or seiz-

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ing their possession. This was the original method of acquiring property; and continued, under certain restrictions, the doctrine of the Roman law, *Quod nullius est, fit occupantis*: but it can have no room in the feudal plan, by which the king is looked on as the original proprietor of all the lands within his dominions.

4. Even in that sort of moveable goods which are presumed to have once had an owner, this rule obtains by the law of Scotland, *Quod nullius est, fit domini regis*. Thus, the right of treasures hid under ground, is not acquired by occupation, but accrues to the king. Thus also, where one finds strayed cattle or other moveables, which have been lost by the former owner, the finder acquires no right in them, but must give public notice thereof; and if, within year and day after such notice, the proprietor does not claim his goods, they fall to the king, sheriff, or other person to whom the king has made a grant of such escheats.

5. In that sort of moveables which never had an owner, as wild-beasts, fowls, fishes, or pearls found on the shore, the original law takes place, that he who first apprehends, becomes proprietor; in so much, that though the right of hunting, fowling, and fishing, be restrained by statute, under certain penalties, yet all game, even what is caught in contravention of the law, becomes the property of the catcher, unless where the confiscation thereof is made part of the penalty: but whales thrown in or killed on our coasts, belong neither to those who kill them, nor to the proprietor of the grounds on which they are cast; but to the king, providing they are so large as that they cannot be drawn by a wane with six oxen.

Accession.

6. Accession is that way of acquiring property, by which, in two things which have a connection with or dependence on one another, the property of the principal thing draws after it the property of its accessory. Thus the owner of a cow becomes the owner of the calf; a house belongs to the owner of the ground on which it stands, though built with materials belonging to and at the charge of another; trees taking root in our ground, though planted by another, become ours. Thus also, the insensible addition made to one's ground by what a river washes from other grounds, which is called *alluvio*, accrues to the master of the ground which receives the addition. The Romans excepted from this rule the case of paintings drawn on another man's board or canvas, in consideration of the excellency of the art; which exception our practice has for a like reason extended to similar cases.

7. Under accession is comprehended SPECIFICATION; Specification, by which is meant, a person's making a new species or subject, from materials belonging to another.

Where the new species can be again reduced to the matter of which it was made, law considers the former mass as still existing; and therefore, the new species, as an accessory to the former subject, belongs to the proprietor of that subject: but where the thing made cannot be so reduced, as in the case of wine, which cannot be again turned into grapes, there is no place for the *specio juris*; and therefore the workmanship draws after it the property of the materials.

8. Though the new species should be produced from the COMMIXION or confusion of different substances, belonging to different proprietors, the same rule holds; but where the mixture is made by the common consent

of

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*Bona fide.*

of the owners, such consent makes the whole a common property, according to the shares that each proprietor had formerly in the several subjects. Where things of the same sort are mixed without the consent of the proprietors, which cannot again be separated, *e. g.* two hogheads of wine, the whole likewise becomes a common property; but, in the after-division, regard ought to be had to the different quality of the wines: if the things so mixed admit of a separation, *e. g.* two flocks of sheep, the property continues distinct.

9. Property is carried from one to another by **TRADITION**; which is the delivery of possession by the proprietor, with an intention to transfer the property to the receiver. Two things are therefore requisite, in order to the transmitting of property in this way: 1. The intention or consent of the former owner to transfer it on some proper title of alienation, as sale, exchange, gift, &c. (2.) The actual delivery in pursuance of that intention. The first is called the *causa*, the other the *modus transferendi dominii*: which last is so necessary to the acquiring of property, that he who gets the last right, with the first tradition, is preferred, according to the rule, *Traditionibus, non nudis pactis, transferuntur rerum dominia*.

10. Tradition is either real, where the *ipsa corpora* of moveables are put into the hands of the receiver; or symbolical, which is used where the thing is incapable of real delivery, or even when actual delivery is only inconvenient. Where the possession or custody of the subject has been before with him to whom the property is to be transferred, there is no room for tradition.

11. Possession, which is essential both to the acquisition and enjoyment of property, is defined, the detention of a thing, with a design or *animus*; in the detainer of holding it as his own. It cannot be acquired by the sole act of the mind, without real detention; but, being once acquired, it may be continued *solo animo*. Possession is either natural, or civil. Natural possession is, when one possesses by himself: thus, we possess lands by cultivating them and reaping their fruits, houses by inhabiting them, moveables by detaining them in our hands. Civil possession is our holding the thing, either by the sole act of the mind, or by the hands of another who holds it in our name: thus, the owner of a thing lent possesses it by the borrower; the proprietor of lands, by his tackman, trustee, or steward; &c. The same subject cannot be possessed entirely, or in *solidum*, by two different persons at one and the same time; and therefore possession by an act of the mind ceases, as soon as the natural possession is so taken up by another, that the former possessor is not suffered to re-enter. Yet two persons may, in the judgment of law, possess the same subject, at the same time, on different rights: thus, in the case of a pledge, the creditor possesses it in his own name, in virtue of the right of impignoration; while the proprietor is considered as possessing, in and through the creditor, in so far as necessary for supporting his right of property. The same doctrine holds in liciters, tackmen, and, generally, in every case where there are rights affecting a subject, distinct from the property.

12. A *bona fide* possessor is he, who, though he is not really proprietor of the subject, yet believes himself proprietor on probable grounds. A *mala fide* possessor knows, or is presumed to know, that what he possesses

is the property of another. A possessor *bona fide* acquired right, by the Roman law, to the fruits of the subject possessed, that had been reaped and consumed by himself, while he believed the subjects his own. By our customs, perception alone, without consumption, secures the possessor: nay, if he has sown the ground, while his *bona fides* continued, he is intitled to reap the crop, *propter curam et culturam*. But this doctrine does not reach to civil fruits, *e. g.* the interest of money, which the *bona fide* receiver must restore, together with the principal, to the owner.

13. *Bona fides* necessarily ceaseth by the *consentientia rei alienae* in the possessor, whether such consciousness should proceed from legal interpellation, or private knowledge. *Mala fides* is sometimes induced, by the true owner's bringing his action against the possessor, sometimes not till litigation, and, in cases uncommonly favourable, not till sentence be pronounced against the possessor.

14. The property of moveable subjects is presumed by the bare effect of possession, until the contrary be proved; but possession of an immoveable subject, tho' for a century of years together, if there is no scisin, does not create even a presumptive right to it: *Nulla salsina, nulla terra*. Such subject is considered as caducuary, and so accrues to the sovereign. Where the property of a subject is contested, the lawful possessor is intitled to continue his possession, till the point of right be discussed; and, if he has lost it by force or stealth, the judge will, upon summary application, immediately restore it to him.

15. Where a possessor has several rights in his person, affecting the subject possessed, the general rule is, that he may ascribe his possession to which of them he pleases; but one cannot ascribe his possession to a title other than that on which it commenced, in prejudice of him from whom his title flowed.

SECT. II. Of heritable and moveable rights.

clxiii.

For the better understanding the doctrine of this title, it must be known, that by the law of Scotland, and indeed of most nations of Europe since the introduction of feus, where-ever there are two or more in the same degree of consanguinity to one who dies intestate, and who are not all females, such rights belonging to the deceased as are either properly feudal, or have any resemblance to feudal rights, descend wholly to one of them, who is considered as his proper heir; the others, who have the name of next of kin or executors, must be contented with that portion of the estate which is of a more perishable nature. Hence has arisen the division of rights to be explained under this title: the subjects descending to the heir, are styled heritable; and those that fall to the next of kin, moveable.

2. All rights of, or affecting lands, under which are comprehended houses, mills, fisheries, teinds; and all rights of subjects that are *fundo annexa*, whether completed by scisin or not; are heritable *ex sua natura*. On the other hand, every thing that moves itself or can be moved, and in general whatever is not united to land, is moveable: as household-furniture, corns, cattle, cash, arrears of rent and of interest, even tho' they should be due on a right of annualrent: for though the arrears last mentioned are secured on land, yet being presently payable, they are considered as cash.

Division of rights into heritable and moveable.

Law of  
Scotland.

3. Debts, (*nomina debitorum*), when due by bill, promissory note, or account, are moveable. When constituted by bond, they do not all fall under any one head; but are divided into heritable and moveable, by the following rules. All debts constituted by bond bearing an obligation to invest the creditor in any heritable subject in security of the principal sum and annualrent, or annualrent only, are heritable; for they not only carry a yearly profit, but are secured upon land.

4. Bonds merely personal, though bearing a clause of interest, are moveable as to succession; i. e. they go not to the heir, but to the next of kin or executors; but they are heritable with respect to the fife, and to the rights of husband and wife; that is, though, by the general rule, moveable rights fall under the communion of goods consequent upon marriage, and the moveables of denounced persons fall to the crown or fife, by single escheat, yet such bonds do neither, but are heritable in both respects.

5. Bonds taken payable to heirs and assignees, secluding executors, are heritable in all respects, from the destination of the creditor. But a bond, which is made payable to heirs, without mention of executors, descends, not to the proper heir in heritage, though heirs are mentioned in the bond, but to the executor; for the word *heir*, which is a generic term, points out him who is to succeed by law in the right; and the executor, being the heir *in mobilibus*, is considered as the person to whom such bond is taken payable. But where a bond is taken to heirs-male, or to a series of heirs, one after another, such bond is heritable, because its destination necessarily excludes executors.

How move-  
able rights  
become he-  
ritable.

6. Subjects originally moveable become heritable, (1.) By the proprietor's destination. Thus, a jewel, or any other moveable subject, may be provided to the heir, from the right competent to every proprietor to settle his property on whom he pleases. (2.) Moveable rights may become heritable, by the supervening of an heritable security: Thus, a sum due by a personal bond becomes heritable, by the creditor's accepting an heritable right for securing it, or by adjudging upon it.

7. Heritable rights do not become moveable by accessory moveable securities; the heritable right being in such case the *jus nobiliss*, which draws the other after it.

Rights  
partly heri-  
table, partly  
moveable.

8. Certain subjects partake, in different respects, of the nature both of heritable and moveable. Personal bonds are moveable in respect of succession; but heritable as to the fife, and husband and wife. All bonds, whether merely personal, or even heritable, on which no *seisin* has followed, may be affected at the suit of creditors, either by adjudication, which is a diligence proper to heritage; or by arrestment, which is peculiar to moveables. Bonds secluding executors, though they descend to the creditor's heir, are payable by the debtor's executors, without relief against the heir; since the debtor's succession cannot be affected by the destination of the creditor.

What peri-  
od makes a  
subject he-  
ritable or  
moveable.

9. All questions, whether a right be heritable or moveable, must be determined according to the condition of the subject at the time of the ancestor's death. If it was heritable at that period, it must belong to the heir; if moveable, it must fall to the executor, without

regard to any alterations that may have affected the subject in the intermediate period between the ancestor's death and the competition.

Law of  
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## I. HERITABLE RIGHTS.

SECT. III. *Of the constitution of heritable rights by charter and seisin.* cxiv.

HERITABLE rights are governed by the feudal law, which owed its origin, or at least its first improvements, to the Longobards; whose kings, upon having penetrated into Italy, the better to preserve their conquests, made grants to their principal commanders of great part of the conquered provinces, to be again subdivided by them among the lower officers, under the conditions of fidelity and military service. Origin of the feudal law.

2. The feudal constitutions and usages were first reduced into writing, about the year 1150, by two lawyers of Milan, under the title of *Consuetudines Feudorum*. None of the German Emperors appear to have expressly confirmed this collection by their authority; but it is generally agreed, that it had their tacit approbation, and was considered as the customary feudal law of all the countries subject to the empire. No other country has ever acknowledged these books for their law; but each state has formed to itself such a system of feudal rules, as best agreed with the genius of its own constitution. In feudal questions, therefore, we are governed, in the first place, by our own statutes and customs; where these fail us, we have regard to the practice of neighbouring countries, if the genius of their law appears to be the same with ours; and should the question still remain doubtful, we may have recourse to those written books of the feus, as to the original plan on which all feudal systems have proceeded.

3. This military grant got the name, first of *beneficium*, and afterwards of *feudum*; and was defined a gratuitous right to the property of lands, made under the conditions of fealty and military service, to be performed to the grantor by the receiver; the radical right of the lands still remaining in the grantor. Under lands, in this definition, are comprehended all rights or subjects so connected with land, that they are deemed a part thereof; as houses, mills, fisheries, jurisdictions, patronages, &c. Though feus in their original nature were gratuitous, they soon became the subject of commerce; services of a civil or religious kind were frequently substituted in place of military; and now, of a long time, services of every kind have been entirely dispensed with, in certain feudal tenures. He who makes the grant is called the *superior*, and he who receives it the *vassal*. The subject of the grant is commonly called the *feus*; though that word is at other times, in our law, used to signify one particular tenure. See Sect. iv. 2. The interest retained by the superior in the feus is styled *dominium directum*, or the superiority; and the interest acquired by the vassal, *dominium utile*, or the property. The word *fee* is promiscuously applied to both. Definition of feus.

4. Allodial goods are opposed to feus; by which are Allodial understood, goods enjoyed by the owner, independent goods of a superior. All moveable goods are allodial; lands only are so when they are given without the condition of fealty or homage. By the feudal system, the sovereign, who is the fountain of feudal rights, reserves to himself

Superior  
and vassal



Law of  
Scotland.

himself the superiority of all the lands of which he makes the grant ; so that, with us, no lands are allodial, except those of the king's own property, the superiorities which the king reserves in the property-lands of his subjects, and manes and glebes, the right of which is completed by the presbytery's designation, without any feudal grant.

Who can  
grant feudal  
rights.

5. Every person who is in the right of an immovable subject, provided he has the free administration of his estate, and is not debarred by statute, or by the nature of his right, may dispose of it to another. Nay, a vassal, though he has only the *dominium utile*, can subfeu his property to a subvassal by a subaltern right, and thereby raise a new *dominium directum* in himself, subordinate to that which is in his superior ; and so *in infinitum*. The vassal who thus subfeus is called the subvassal's immediate superior, and the vassal's superior is the subvassal's mediate superior.

Who can  
receive  
them.

6. All persons who are not disabled by law, may acquire and enjoy feudal rights. Papists cannot purchase a land estate by any voluntary deed. Aliens, who owe allegiance to a foreign prince, cannot hold a feudal right without naturalization : and therefore, where such privilege was intended to be given to favoured nations or persons, statutes of naturalization were necessary, either general or special ; or at least, letters of naturalization by the sovereign.

What sub-  
jects can be  
granted in  
feu.

7. Every heritable subject, capable of commerce, may be granted in feu. From this general rule is excepted, 1. The annexed property of the Crown, which is not alienable without a previous dissolution in parliament. 2. Tailized lands, which are devised under condition that they shall not be aliened. 3. An estate in *hereditate jacente* cannot be effectually aliened by the heir-apparent (*i. e.* not entered) ; but such alienation becomes effectual upon his entry, the supervening right accruing in that case to the purchaser ; which is a rule applicable to the alienation of all subjects not belonging to the vender at the time of the sale.

Feudal  
charter.

8. The feudal right, or, as it is called, *investiture*, is constituted by charter and seisin. By the charter, we understand that writing which contains the grant of the feudal subject to the vassal, whether it be executed in the proper form of a charter, or of a disposition. Charters by subject-superiors are granted, either, 1. *A me de superiore meo*, when they are to be holden, not of the grantor himself, but of his superior. This sort is called a *public holding*, because vassals were in ancient times publicly received in the superior's court before the *pares curie* or co-vassals. Or, 2. *De me*, where the lands are to be holden of the grantor. These were called sometimes *base rights*, from *bas*, lower : and sometimes *private*, because, before the establishment of our records, they were easily concealed from third parties ; the nature of all which will be more fully explained, Sect. vii. An original charter is that by which the fee is first granted : A charter by progress is a renewed disposition of that fee to the heir or assigny of the vassal. All doubtful clauses in charters by progress ought to be construed agreeably to the original grant ; and all clauses in the original charter are understood to be implied in the charters by progress, if there be no express alteration.

Its consti-  
tuent parts.

9. The first clause in an original charter, which follows immediately after the name and designation of the

grantor, is the narrative or recital, which expresses the causes inductive of the grant. If the grant be made for a valuable consideration, it is said to be onerous ; if for love and favour, gratuitous. In the dispositive clause of a charter, the subjects made over are described either by special boundaries or march-stones, (which is called a *bounding charter*), or by such other characters as may sufficiently distinguish them. A charter regularly carries right to no subjects but what are contained in this clause, though they should be mentioned in some other clause of the charter.

Law of  
Scotland.

10. The clause of *tenendas* (from its first words *tenendas preedictas terras*) expresses the particular tenure by which the lands are to be holden. The clause of *reddendo* (from the words, *reddendo inde annuatim*) specifies the particular duty or service which the vassal is to pay or perform to the superior.

11. The clause of warrandice is that by which the grantor obliges himself that the right conveyed shall be effectual to the receiver. Warrandice is either personal or real. Personal warrandice, where the grantor is only bound personally, is either, 1. Simple, that he shall grant no deed in prejudice of the right ; and this sort, which is confined to future deeds, is implied even in donations. 2. Warrandice from fact and deed, by which the grantor warrants that the right neither has been, nor shall be, hurt by any fact of his. Or, 3. Absolute warrandice *contra omnes mortales*, whereby the right is warranted against all legal defects in it which may carry it off from the receiver either wholly or in part. Where a sale of lands proceeds upon an onerous cause, the grantor is liable in absolute warrandice, though no warrandice be expressed ; but in assignments to debts or decrees, no higher warrandice than from fact and deed is implied.

Warrant-  
dice.

12. Gratuitous grants by the Crown imply no warrandice ; and though warrandice should be expressed, the clause is ineffectual, from a presumption that it has crept in by the negligence of the Crown's officers. But where the Crown makes a grant, *not jure corone*, but for an adequate price, the sovereign is in the same case with his subjects.

13. Absolute warrandice, in case of eviction, affords an action to the grantee, against the grantor, for making up to him all that he shall have suffered through the defect of the right ; and not simply for his indemnification, by the grantor's repayment of the price to him. But as warrandice is penal, and consequently *stricti juris*, it is not easily presumed, nor is it incurred from every light servitude that may affect the subject, far less does it extend to burdens which may affect the subject posterior to the grant, nor to those imposed by public statute, whether before or after, unless specially warranted against.

Effects of  
warrandice.

14. Real warrandice is either, 1. Express, whereby, in security of the lands principally conveyed, other lands called *warrandice-lands*, are also made over, to which the receiver may have recourse in case the principal lands be evicted. Or, 2. Tacit, which is constituted by the exchange or exambion of one piece of ground with another ; for, if the lands exchanged are carried off from either of the parties, the law itself, without any paction, gives that party immediate recourse upon his own first lands, given in exchange for the lands evicted.

Real war-  
randice.

Exambi-  
ground.

**Law of Scotland.** 15. The charter concludes with a precept of feisin, which is the command of the superior granter of the right to his bailie, for giving feisin or possession to the vassal, or his attorney, by delivering to him the proper symbols. Any person, whose name may be inserted in the blank, left in the precept for that purpose, can execute the precept as bailie; and whoever has the precept of feisin in his hands, is presumed to have a power of attorney from the vassal for receiving possession in his name.

**Instrument of feisin.** 16 A feisin is the instrument or attestation of a notary, that possession was actually given by the superior or his bailie, to the vassal or his attorney; which is considered as so necessary a solemnity, as not to be suppliable, either by a proof of natural possession, or even of the special fact that the vassal was duly entered to the possession by the superior's bailie.

**Symbols used in feisins.** 17. The symbols by which the delivery of possession is expressed, are, for lands, earth and stone; for rights of annualrent payable forth of land, it is also earth and stone with the addition of a penny money; for parsonage teinds, a sheaf of corn; for jurisdictions, the book of the court; for patronages, a psalm-book, and the keys of the church; for fishings, net and coble; for mills, clap and happer, &c. The feisin must be taken upon the ground of the lands, except where there is a special dispensation in the charter from the Crown.

**Registration of feisins.** 18. All feisins must be registered within sixty days after their date, either in the general register of feisins at Edinburgh, or in the register of the particular shire appointed by the act 1617; which, it must be observed, is not, in every case, the shire within which the lands lie. Burgage feisins are ordained to be registered in the books of the burrough.

19. Unregistered feisins are ineffectual against third parties, but they are valid against the granters and their heirs. Seisins regularly recorded, are preferable, not according to their own dates, but the dates of their registration.

**One feisin serves in contiguous and in united tenements.** 20. Seisin necessarily supposes a superior by whom it is given; the right therefore which the sovereign, who acknowledges no superior, has over the whole lands of Scotland, is constituted, *jure coronæ*, without feisin. In several parcels of land that lie contiguous to one another, one feisin serves for all, unless the right of the several parcels be either holden of different superiors, or derived from different authors, or enjoyed by different tenures under the same superior. In discontinuous lands, a separate feisin must be taken on every parcel, unless the sovereign has united them into one tenantry by a charter of union; in which case, if there is no special place expressed, a feisin taken on any part of the united lands will serve for the whole, even though they be situated in different shires. The only effect of union is, to give the discontinuous lands the same quality as if they had been contiguous or naturally united; union, therefore, does not take off the necessity of separate feisins, in lands holden by different tenures, or the rights of which flow from different superiors, these being incapable of natural union.

**Barony implies union.** 21. The privilege of barony carries a higher right than union does, and consequently includes union in it as the lesser degree. This right of barony can neither be given, nor transmitted, unless by the Crown; but the quality of simple union, being once conferred on

lands by the sovereign, may be communicated by the vassal to a subvassal. Though part of the lands united or erected into a barony be sold by the vassal to be holden *a me*, the whole union is not thereby dissolved: what remains unsold retains the quality.

22. A charter, not perfected by feisin, is a right merely per se, which does not transfer the property; (see N° clxxiii. 1.); and a feisin of itself bears no faith, without its warrant: It is the charter and feisin joined together that constitutes the feudal right, and secures the receiver against the effect of all posterior feisins, even though the charters on which they proceed should be prior to his.

23. No quality which is designed as a lien or real burden on a feudal right, can be effectual against singular successors, if it be not inserted in the investiture. If the creditors in the burden are not particularly mentioned, the burden is not real; for no perpetual unknown incumbrance can be created upon lands. Where the right itself is granted with the burden of the sum therein mentioned, or where it is declared void if the sum be not paid against a day certain, the burden is real; but where the receiver is simply obliged by his acceptance to make payment, the clause is effectual only against him and his heirs.

#### SECT. IV. Of the several kinds of Holding.

**FEDERAL** subjects are chiefly distinguished by their different manners of holding, which were either ward, blanch, feu, or burgage. Ward-holding, which is now abolished by 20 Geo. II. c. 50. was that which was granted for military service. Its proper *reddendo* was, *services*, or *services used and wont*; by which last was meant the performance of service whenever the superior's occasions required it. As all feudal rights were originally held by this tenure, ward-holding was in *dubio* presumed. Hence, though the *reddendo* had contained some special service, or yearly duty, the holding was presumed ward, if another holding was not particularly expressed.

2. Feu-holding is that whereby the vassal is obliged to pay to the superior a yearly rent in money or grain, and sometimes also in services proper to a farm, as ploughing, reaping, carriages for the superior's use, &c. *nomine feudi firme*. This kind of tenure was introduced for the encouragement of agriculture, the improvement of which was considerably obstructed by the vassal's obligation to military service. It appears to have been a tenure known in Scotland as far back as *leges burgorum*.

3. Blanch-holding is that whereby the vassal is to pay to the superior an clusory yearly duty, as a penny money, a rose, a pair of gilt spurs, &c. merely in acknowledgment of the superiority, *nomine alba firme*. This duty, where it is a thing of yearly growth, if it be not demanded within the year, cannot be exacted thereafter; and where the words, *si petatur tantum*, are subjoined to the *reddendo*, they imply a release to the vassal, whatever the quality of the duty may be, if it is not asked within the year.

4. Burgage-holding is that, by which borough-royal hold of the sovereign the lands which are contained in their charters of erection. This, in the opinion of *Craig*, does not constitute a separate tenure, but

A charter becomes real only after feisin.

All burden must be inserted in the investiture.

clxv.

Ward-holding.

Feu-holding.

Blanch-holding.

Burgage-holding.

Law of Scotland.

Law of Scotland.

Beneficial.

Ex vi.

Ed. v. of Superiority.

Qual. pts.

Ord-hold.

Ord-hold.

but is a species of ward-holding; with this speciality, that the vassal is not a private person, but a community; and indeed, watching and warding, which is the usual service contained in the *reddendo* of such charters, might be properly enough said, some centuries ago, to have been of the military kind. As the royal borough is the king's vassal, all burghage-holders hold immediately of the crown: the magistrates therefore, when they receive the relinquishments of the particular burghesses, and give seisin to them, act, not as superiors, but as the king's bailies specially authorized thereto.

5. Feudal subjects, granted to churches, monasteries, or other societies for religious or charitable uses, are said to be mortified, or granted *ad manum mortuam*; either because all casualties must necessarily be lost to the superior, where the vassal is a corporation, which never dies; or because the property of these subjects is granted to a dead hand, which cannot transfer it to another. In lands mortified in times of Popery to the church, whether granted to prelates for the behoof of the church, or *in puram elemosinam*; the only services pretable by the vassals were prayers, and singing of masses for the souls of the deceased, which approaches nearer to blanch-holding than ward. The purposes of such grants having been, upon the reformation, declared superstitious, the lands mortified were annexed to the crown: but mortifications to universities, hospitals, &c. were not affected by that annexation; and lands may, at this day, be mortified to any lawful purpose, either by blanch or by feu holding.

SECT. V. Of the casualties due to the superior.

THE right of the superior continues unimpaired, notwithstanding the feudal grant, unless in so far as the *dominium utile*, or property, is conveyed to his vassal. The superiority carries a right to the services and annual duties contained in the *reddendo* of the vassal's charter. The duty payable by the vassal is a *debitum fundi*; i. e. it is recoverable, not only by a personal action against himself, but by a real action against the lands.

2. Besides the constant fixed rights of superiority, there are others, which, because they depend upon uncertain events, are called *casualties*.

3. The casualties proper to a ward-holding, while that tenure subsisted, were ward, recognition, and marriage, which it is now unnecessary to explain, as by the late statutes 20 and 25 Geo. II. for abolishing ward-holdings, the tenure of the lands holden ward of the crown or prince is turned into *blanch*, for payment of one penny Scots yearly, *si petatur tantum*; and the tenure of those holden of subjects, into *feu*, for payment of such yearly feu-duty in money, victual, or cattle, in place of all services, as shall be fixed by the court of session. And accordingly that court, by act of federunt, Feb. 8. 1749, laid down rules for ascertaining the extent of these feu-duties.

4. The only casualty, or rather forfeiture, proper to feu-holdings, is the loss or tinsel of the feu-right, by the neglect of payment of the feu-duty for two full years. Yet where there is no conventional irritancy in the feu-right, the vassal is allowed to purge the legal irritancy at the bar; that is, he may prevent the for-

feiture, by making payment before sentence: but where the legal irritancy is forfeited by a conventional, he is not allowed to purge, unless where he can give a good reason for the delay of payment.

5. The casualties common to all holdings are, non-entry, relief, liferent-efcheat, disclamation, and purpresture. NON-ENTRY is that casualty which arises to the superior out of the rents of the feudal subject, through the heir's neglecting to renew the investiture after his ancestor's death. The superior is intitled to this casualty, not only where the heir has not obtained himself seisin, but where his retour is set aside upon nullities. The heir, from the death of the ancestor, till he be cited by the superior in a process of general declarator of non-entry, loses not only the retoured duties of his lands, (see next parag.) ; and he forfeits these, though his delay should not argue any contempt of the superior, because the casualty is considered to fall, as a condition implied in the feudal right, and not as a penalty of transgression: but, where the delay proceeds not from the heir, but from the superior, nothing is forfeited.

Non-entry.

6. For understanding the nature of retoured duties, it must be known, that there was anciently a general valuation of all the lands in Scotland, designed both for regulating the proportion of public subsidies, and for ascertaining the quantity of non-entry and relief-duties payable to the superior; which appears, by a contract between K. R. Bruce and his subjects anno 1327, preserved in the library of the Faculty of Advocates, to have been settled at least as far back as the reign of Alexander III. This valuation became in the course of time, by the improvement of agriculture, and perhaps also by the heightening of the nominal value of our money, from the reign of Robert I. downwards to that of James III. much too low a standard for the superior's casualties: wherefore, in all services of heirs, the inquest came at last to take proof likewise of the present value of the lands contained in the brief (*quantum nunc valent*) in order to fix these casualties.

Retoured duties.

The Old and first was called the *old*, and the other the *new*, extent, new extents. Though both extents were ordained to be specified in all retours made to the chancery upon briefs of inquest; yet by the appellation of retoured duties in a question concerning casualties, the new extent is always understood. The old extent continued the rule for levying public subsidies, till a tax was imposed by new proportions, by several acts made during the usurpation. By two acts of Cromwell's parliament, held at Westminster in 1656, imposing taxations on Scotland, the rates laid upon the several counties are precisely fixed. The subsidy granted by the act of convention 1667 was levied on the several counties, nearly in the same proportions that were fixed by the usurper in 1656; and the sums to which each county was subjected were subdivided among the individual land-holders in that county, according to the valuations already settled, or that should be settled by the commissioners appointed to carry that act into execution. The rent fixed by these valuations is commonly called the *valued rent*; Valued according to which the land-tax, and most of the other rent public burdens, have been levied since that time.

7. In feu-holdings, the feu-duty is retoured as the rent, because the feu-duty is presumed to be, and truly was at first, the rent. The superior therefore of a feu-hold-

hold-



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holding gets no non-entry, before citation in the general declarator; for he would have been intitled to the yearly feu-duty, though the fee had been full, *i. e.* though there had been a vassal infest in the lands. The superior of teinds gets the fifth part of the retoured duty as non-entry, because the law considers teinds to be worth a fifth part of the rent. In rights of annualrent which are holden of the granter, the annualrenter becomes his debtor's vassal; and the annualrent contained in the right is retoured to the blanch or other duty contained in the right before declarator.

8. It is because the retoured duty is the presumed rent, that the non-entry is governed by it. If therefore no retour of the lands in non-entry can be produced, nor any evidence brought of the retoured duty, the superior is intitled to the real, or at least to the valued, rent, even before citation. In lands formerly holden ward of the King, the heir, in place of the retoured duties, is subjected only to the annual payment of one *per cent.* of the valued rent.

9. The heir, after he is cited by the superior in the action of general declarator, is subjected to the full rents till his entry, because his neglect is less excusable after citation. The decree of declarator, proceeding on this action, intitles the superior to the possession, and gives him right to the rents downward from the citation. As this sort of non-entry is properly penal, our law has always restricted it to the retoured duties, if the heir had a probable excuse for not entering.

In what  
cases non-  
entry is not  
due.

10. Non-entry does not obtain in burgh-holdings, because the incorporation of inhabitants holds the whole incorporated subjects of the King; and there can be no non-entry due in lands granted to communities, because there the vassal never dies. This covers the right of particulars from non-entry: for if non-entry be excluded with regard to the whole, it cannot obtain with regard to any part. It is also excluded, as to a third of the lands, by the *terce*, during the widow's life; and as to the whole of them, by the courtesy during the life of the husband. But it is not excluded by a precept of *seisin* granted to the heir, till *seisin* be taken thereupon.

Relief.

11. RELIEF is that casualty which intitles the superior to an acknowledgment or consideration from the heir, for receiving him as vassal. It is called *relief*, because, by the entry of the heir, his fee is relieved out of the hands of the superior. It is not due in feu-holdings flowing from subjects, unless where it is expressed in the charter by a special clause for doubling the feu-duty at the entry of an heir; but, in feu-rights holden of the crown, it is due, though there should be no such clause in the charter. The superior can recover this casualty, either by a pointing of the ground, as a *debitum fundi*, or by a personal action against the heir. In blanch and feu holdings, where this casualty is expressly stipulated, a year's blanch or feu duty is due in name of *relief*, beside the current year's duty payable in name of *blanch* or *feu farm*.

Eſcheat.

12. ESCHIEAT (from *escheoir*, to happen or fall) is that forfeiture which falls through a person's being denounced rebel. It is either single or liferent. Single escheat, though it does not accrue to the superior, must be explained in this place, because of its coincidence with liferent.

13. After a debt is constituted, either by a formal

decree, or by registration of the ground of debt, which, to the special effect of execution, is in law accounted a decree; the creditor may obtain letters of horning, issuing from the signet, commanding messengers to charge the debtor to pay or perform his obligation, within a day certain. Where horning proceeds on a formal decree of the Session, the time indulged by law to the debtor is fifteen days; if upon a decree of the commission of teinds or admiral, it is ten; and upon the decrees of all inferior judges, fifteen days. Where it proceeds on a registered obligation, which specifies the number of days, that number must be the rule; and, if no precise number be mentioned, the charge must be given on fifteen days, which is the term of law, unless where special statute interposes; as in bills, upon which the debtor may be charged on six days.

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Letters of  
horning.

14. The messenger must execute these letters (and indeed all *summons*) against the debtor, either personally or at his dwelling-house; and, if he get not access to the house, he must strike six knocks at the gate, and thereafter affix to it a copy of his execution. If payment be not made within the days mentioned in the horning, the messenger, after proclaiming three o'yeases at the market-cross of the head borough of the debtor's domicile, and reading the letters there, blows three blasts with a horn, by which the debtor is understood to be proclaimed rebel to the king for contempt of his authority; after which, he must affix a copy of the execution to the market-cross: This is called the *publication of the diligence*, or a *denunciation at the horn*. Where the debtor is not in Scotland, he must be charged on sixty days, and denounced at the market-cross of Edinburgh, and pier and shore of Leith.

Denunc-  
tion.

15. Denunciation, if registered within 15 days, either in the sheriff's books, or in the general register, drew after it the rebel's single escheat, *i. e.* the forfeiture of his moveables to the crown. Persons denounced rebels have not a *persona standi in judicio*; they can neither sue nor defend in any action. But this incapacity being unfavourable, is personal to the rebel, and cannot be pleaded against his assignee.

Consequ-  
ces ther-

16. Persons cited to the court of justice may be also denounced rebels, either for appearing there with too great a number of attendants; or, if they fail to appear, they are declared fugitives from the law. Single escheat falls, without denunciation, upon sentence of death pronounced in any criminal trial; and, by special statute, upon one's being convicted of certain crimes, though not capital; as perjury, bigamy, deforcement, breach of arrestment, and usury. By the late act abolishing wardholdings, the casualties both of single and liferent escheat are discharged, when proceeding upon denunciation for civil debts; but they still continue, when they arise from criminal causes. All moveables belonging to the rebel at the time of his rebellion, (whether proceeding upon denunciation, or sentence in a criminal trial), and all that shall be afterwards acquired by him until relaxation, fall under single escheat. Bonds bearing interest, because they continue heritable *quoad fiscum*, fall not under it, nor such fruits of heritable subjects as become due after the term next ensuing the rebellion, these being reserved for the liferent escheat.

Denunc-  
tion in  
criminal

17. The king never retains the right of escheat to himself,

himself, but makes it over to a donatory, whose gift is not perfected, till, upon an action of general declarator, it is declared that the rebel's escheat has fallen to the crown by his denunciation, and that the right of it is now transferred to the pursuer by the gift in his favour. Every creditor therefore of the rebel, whose debt was contracted before rebellion, and who has used diligence before declarator, is preferable to the donatory. But the escheat cannot be affected by any debt contracted, nor by any voluntary deed of the rebel after rebellion.

18. The rebel, if he either pays the debt charged for, or suspends the diligence, may procure letters of relaxation from the horn, which, if published in the same place, and registered 15 days thereafter in the same register with the denunciation, have the effect to restore him to his former state; but they have no retro-spect as to the moveables already fallen under escheat, without a special clause for that purpose.

19. The rebel, if he continues unrelaxed for year and day after rebellion, is confined to be civilly dead: and therefore, where he holds any feudal right, his superiors, as being without a vassal, are entitled, each of them, to the rents of such of the lands belonging to the rebel as hold of himself, during all the days of the rebel's natural life, by the casualty of *LIFERENT ES-CHEAT*; except where the denunciation proceeds upon treason or proper rebellion, in which case the liferent falls to the king.

20. It is that estate only, to which the rebel has a proper right of liferent in his own person, that falls under his liferent escheat.

21. Though neither the superior nor his donatory can enter into possession in consequence of this casualty, till decree of declarator; yet that decree, being truly declaratory, has a retrospect, and does not so properly confer a new right, as declare the right formerly constituted to the superior, by the civil death of his vassal. Hence, all charters or heritable bonds, though granted prior to the rebellion, and all adjudications, though led upon debts contracted before that period, are in effectual against the liferent escheat, unless seisin be taken thereon within year and day after the grantor's rebellion.

22. Here, as in single escheat, no debt contracted after rebellion can hurt the donatory, nor any voluntary right granted after that period, though in security or satisfaction of prior debts.

23. *DISCLAMATION* is that casualty whereby a vassal forfeits his whole feu to his superior, if he disowns or disclaims him, without ground, as to any part of it. *PURPRESTURE* draws likewise a forfeiture of the whole feu after it; and is incurred by the vassal's encroaching upon any part of his superior's property, or attempting by building, inclosing, or otherwise, to make it his own. In both these feudal delinquencies, the least colour of excuse saves the vassal.

24. All grants from the crown, whether charters, gifts of casualties, or others, proceed on signatures which pass the signet. When the king resided in Scotland, all signatures were superscribed by him; but, on the accession of James VI. to the crown of England, a cachet or seal was made, having the king's name engraved on it, in pursuance of an act of the privy-council, April 4. 1603. with which all signatures were to

be afterwards sealed, that the lords of exchequer were empowered to pass; and these powers are transferred to the court of exchequer, which was established in Scotland after the union of the two kingdoms in 1707. Grants of higher consequence, as remissions of crimes, gifts proceeding upon forfeiture, and charters of *novodamus*, must have the king's sign-manual for their warrant.

25. If lands holding of the crown were to be conveyed, the charter passed, before the union of the kingdoms in 1707, by the great seal of Scotland; and now by a seal substitute in place thereof. Grants of church-dignities, during episcopacy, passed also by the great seal; and the commissions to all the principal officers of the crown, as Justice-Clerk, King's Advocate, Solicitor, &c. do so at this day. All rights which subjects may transmit by simple assignation, the king transmits by the privy-seal: as gifts of moveables, or of casualties that require no seisin. The quarter seal, otherwise called the *testimonial of the great seal*, is appended to gifts of tutory, commissions of briefs issuing from the chancery, and letters of presentation to lands holding of a subject, proceeding upon forfeiture, bastardy, or *ultimus hæres*.

26. Seals are to royal grants, what subscription is to rights derived from subjects, and give them authority; they serve also as a check to gifts procured (*subreptione vel obreptione*) by concealing the truth, or expressing a falsehood; for, where this appears, the gift may be stopped before passing the seals, tho' the signature should have been signed by the king. All rights passing under the great or privy seal must be registered in the registers of the great or privy seal *respectively*, before appending the seal.

# SECT. VI. Of the right which the vassal acquires by getting the feu. clxvii.

UNDER the *dominium utile* which the vassal acquires by the feudal right, is comprehended the property of *utile*, whatever is considered as part of the lands, whether of houses, woods, inclosures, &c. above ground; or of coal, limestone, minerals, &c. under ground. Mills have, by the generality of our lawyers, been deemed a separate tenement, and so not carried by a charter or disposition, without either a special clause conveying mills, or the erection of the lands into a barony. Yet it is certain, that, if a proprietor builds a mill on his own lands, it will be carried by his entail, or by a retour, without mentioning it, although the lands are not erected into a barony. If the lands disposed bestricted, or thirled to another mill, the purchaser is not allowed to build a new corn-mill on his property, even though he should offer security that it shall not hurt the thirle; which is introduced for preventing daily temptations to fraud.

2. Proprietors are prohibited to hold dove-cotes, unless their yearly rent, lying within two miles thereof, extend to ten chalders of victual. A purchaser of lands, with a dove-cote, is not obliged to pull it down, though he should not be qualified to build one; but, if it becomes ruinous, he cannot rebuild it. The right of brewing, though not expressed in the grant, is implied in the nature of property; as are also the rights of fishing, fowling, and hunting, in so far as they are not restrained by statute.

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Regalia.

3. There are certain rights naturally consequent on property, which are deemed to be preferred by the crown as *regalia*; unless they be specially conveyed. Gold and silver mines are of this sort: the first universally; and the other, where three half-pennies of silver can be extracted from the pound of lead, by act 1424, (three half-pennies at that time was equal to about two shillings five pence of our present Scots money.) These were by our ancient law annexed to the crown; but they are now dissolved from it; and every proprietor is intitled to a grant of the mines within his own lands, with the burden of delivering to the crown a tenth of what shall be brought up.

4. Salmon-fishing is likewise a right understood to be reserved by the crown, if it be not expressly granted; but 40 years possession thereof, where the lands are either erected into a barony, or granted with the general clause of fishings, establishes the full right of the salmon-fishing in the vassal. A charter of lands, within which any of the king's forests lie, does not carry the property of such forest to the vassal.

Res publica.

5. All the subjects which were by the Roman law accounted *res publica*, as rivers, high-ways, ports, &c. are, since the introduction of feus, held to be *inter regalia*, or *in patrimonio principis*; and hence encroachment upon a highway is said to infer purpresture. No person has the right of a free port without a special grant, which implies a power in the grantee to levy anchorage and shore dues, and an obligation upon him to uphold the port in good condition. In this class of things, our forefathers reckoned fortalices, or small places of strength, originally built for the defence of the country, either against foreign invasions, or civil commotions; but these now pass with the lands in every charter.

Pertinents.

6. The vassal acquires right by his grant, not only to the lands specially contained in the charter, but to those that have been possessed 40 years as pertinent thereof. But, 1. If the lands in the grant are marked out by special limits, the vassal is circumscribed by the tenor of his own right, which excludes every subject without these limits from being pertinent of the lands.

2. A right possessed under an express investment is preferable, *ceteris paribus*, to one possessed only as pertinent.

3. Where neither party is *infeft per expressum*, the mutual promiscuous possession by both, of a subject as pertinent, resolves into a community of the subject possessed: but if one of the parties has exercised all the acts of property of which the subject was capable, while the possession of the other was confined to pasturage only, or to casting seal and divot, the first is to be deemed sole proprietor, and the other to have merely a right of servitude.

Privileges  
of barony.

7. As barony is a *nomen universitatis*, and unites the several parts contained in it into one individual right, the general conveyance of a barony carries with it all the different tenements of which it consists, tho' they should not be specially enumerated; (and this holds, even without erection into a barony, in lands that have been united under a special name.) Hence, likewise, the possession by the vassal of the smallest part of the barony-lands preserves to him the right of the whole.

8. The vassal is intitled, in consequence of his property, to levy the rents of his own lands, and to reco-

ver them from his tenants by an action for rent before his own court; and from all other possessors and intruders, by an action of mails and duties before the sheriff. He can also remove from his lands, tenants Tack or lease, who have no leases; and he can grant tacks or leases to others. A tack is a contract of location, whereby the use of land, or any other immovable subject, is let to the lessee or tackman for a certain yearly rent, either in money, the fruits of the ground, or services. It ought to be reduced into writing, as it is a right concerning lands: tacks therefore, that are given verbally, to endure for a term of years, are good against neither party for more than one year. An obligation to grant a tack is as effectual against the grantor, as a formal tack. A liferenter, having a temporary property in the fruits, may grant tacks to endure for the term of his own liferent.

9. The tackman's right is limited to the fruits which spring up annually from the subject set, either naturally, or by the industry of the tackman; he is not therefore intitled to any of the growing timber above ground, and far less to the minerals, coal, clay, &c. under ground, the use of which consumes the substance. Tacks are, like other contracts, personal rights in their own nature, and consequently ineffectual against singular successors in the lands; but, for the encouragement of agriculture, they were, by act 1449, declared effectual to the tackman for the full time of their endurance, into whose hands soever the lands might come.

10. To give a written tack the benefit of this statute, it must mention the special tack-duty payable to the proprietor, which though small, if it be not elusory, secures the tackman; and it must be followed by possession, which supplies the want of a seisin. If a tack does not express the term of entry, the entry will commence at the next term after its date, agreeable to the rule, *Quod pure debetur, presenti die debetur*. If it does not mention the *isth*, *i. e.* the term at which it is to determine, it is good for one year only; but, if the intention of parties to continue it for more than one year, should appear from any clause in the tack, it is sustained for two years as the *minimum*. Tacks granted to perpetuity, or with an indefinite *isth*, have not the benefit of the statute. Tacks of houses within borough do not fall within this act.

11. Tacks necessarily imply a *delectus personarum*, a Tacks choice by the fetter of a proper person for his tenant. *stricti juris* Hence the conveyance of a tack, which is not granted to assignees, is ineffectual without the landlord's consent. A right of tack, though it be heritable, falls under the *jus mariti*, because it cannot be separated from the labouring cattle and implements of tillage, which are moveable subjects. A tack, therefore, granted to a single woman, without the liberty of assigning, falls by her marriage; because the marriage, which is a legal conveyance thereof to the husband, cannot be annulled. This implied exclusion of assignees is however limited to voluntary, and does not extend to necessary assignments; as an adjudication of a tack by the tackman's creditor: but a tack, expressly excluding assignees, cannot be carried even by adjudication. But tackmen may sublet, unless subtenants are expressly excluded; and liferent tacks, because they import a higher degree of right in the tackman than tacks for



a definite term, may be assigned, unless assignees be specially excluded.

12. If neither the fetter nor tackfman shall properly discover their intention to have the tack dissolved at the term fixed for its expiration, they are understood, or presumed, to have entered into a new tack upon the same terms with the former, which is called *tacit relocation*; and continues till the landlord warns the tenant to remove, or the tenant renounces his tack to the landlord: this obtains also in the case of moveable tenants, who possess from year to year without written tacks.

13. In tacks of land, the fetter is commonly bound to put all the houses and office-houses, necessary for the farm, in good condition at the tenant's entry; and the tenant must keep them and leave them so at his removal. But, in tacks of houses, the fetter must not only deliver to the tenant the subject set, in tenantable repair at his entry, but uphold it in that repair during the whole years of the tack.

14. If the inclemency of the weather, inundation, or calamity of war, should have brought upon the crop an extraordinary damage, (*plus quam tolerabile*), the landlord had, by the Roman law, no claim for any part of the tack-duty: if the damage was more moderate, he might exact the full rent. It is nowhere defined, what degree of sterility or devastation makes a loss not to be borne; but the general rule of the Roman law seems to be made ours. Tenants are obliged to pay no public burdens to which they are not expressly bound by their tack, except mill-services.

15. Tacks may be evacuated during their currency, (1.) In the same manner as feu-rights, by the tackfman's running in arrears of his tack-duty for two years together. This irritancy may be prevented by the tenant's making payment at the bar before sentence. (2.) Where the tenant either runs in arrears of one year's rent, or leaves his farm uncultivated at the usual season; in which case he may be ordained to give security for the arrears, and for the rent of the five following crops, if the tack shall subsist so long; otherwise, to remove, as if the tack were at an end. (3.) Tacks may be evacuated at any time, by the mutual consent of parties.

16. The landlord, when he intends to remove a tenant whose tack is expiring, or who possesses without a tack, must, upon a precept signed by himself, warn the tenant forty days preceding the term of Whitfunday, or at immediately preceding the isf, personally, or at his dwelling-house, to remove at that term, with his family and effects. This precept must be also executed on the ground of the lands, and thereafter read in the parish-church where the lands lie, after the morning service, and affixed to the most patent door thereof. Whitfunday, though it be a moveable feast, is, in questions of removing, fixed to the 15th of May. In warnings from tenements within borough, it is sufficient that the tenant be warned forty days before the isf of the tack, whether it be Whitfunday or Martinmas; and in these the ceremony of chalking the door is sustained as warning, when proceeding upon a verbal order from the proprietor.

17. This process of warning was precisely necessary for founding an action of removing against tenants, till act of federunt of the court of session, Dec. 14. 1756,

which leaves it in the option of the proprietor, either to use the former method, or to bring his action of removing before the judge-ordinary; which, if it be called forty days before the said term of Whitfunday, shall be held as equal to a warning. Where the tenant is bound, by an express clause of his tack, to remove at the isf without warning, such obligation is, by the said act, declared to be a sufficient warrant for letters of horning, upon which, if the landlord charge his tenant forty days before the said Whitfunday, the judge is authorized to eject him within six days after the term of removing expressed in the tack.

18. Actions of removing might, even before this act of federunt, have been pursued without any previous warning, (1.) Against vicious possessors, *i. e.* persons who had seized the possession by force, or who, without any legal title, had intruded into it, after the last possessor had given it up. (2.) Against possessors who had a naked tolerance. (3.) Against tenants who had run in arrears of rent, during the currency of their tacks. (4.) Against such as had sold their lands, and yet continued to possess after the term of the purchaser's entry. Upon the same ground, warning was not required, in removing against possessors of liferented lands, after the death of the liferenter who died in the natural possession; but if he possessed by tenants, these tenants could not be disturbed in their possessions till the next Whitfunday; that they might have time to look out for other farms; but they might be compelled to remove at that term, by an action of removing, without warning.

19. A landlord's title in a removing, let it be ever so lame, cannot be brought under question by a tenant whose tack flows immediately from him; but, if he is to insist against tenants not his own, his right must be perfected by infestment, unless it be such as requires no infestment; as terce, &c.

20. The defender, in a removing, must, before offering any defence which is not instantly verified, give security to pay to the fetter the *violent profits*, if they should be awarded against him. These are so called, because the law considers the tenant's possession after the warning as violent. They are estimated, in tenements within borough, to double the rent; and in lands, to the highest profits the pursuer could have made of them, by possessing them either by a tenant, or by himself.

21. If the action of removing shall be passed from, or if the landlord shall, after using warning, accept of rent from the tenant, for any term subsequent to that of the removal, he is presumed to have changed his mind, and tacit relocation takes place. All actions of removing against the principal or original tackfman, and decrees thereupon, if the order be used, which is set forth *supra*, (17.) are, by the act of federunt 1756, declared to be effectual against the assignees to the tack, or subtenants.

22. The landlord has, in security of his tack-duty, Hypothec over and above the tenant's personal obligation, a tacit pledge or hypothec, not only in the fruits, but in the cattle pasturing on the ground. The corn, and other fruits, are hypothecated for the rent of that year whereof they are the crop; for which they remain affected, though the landlord should not use his right for years together.

Actions of removing.

Violent profits.

Effect of warning not insisted in.

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Scotland.Law of  
Scotland.

23. The whole cattle on the ground, considered as a quantity, are hypothecated for a year's rent, one after another successively. The landlord may apply this hypothec for payment of the past year's rent, at any time within three months from the last conventional term of payment, after which it ceases for that year. As the tenant may increase the subject of this hypothec, by purchasing oxen, sheep, &c. so he can impair it, by selling part of his stock; but if the landlord suspects the tenant's management, he may, by sequestration or pointing, make his right, which was before general upon the whole flock, special upon every individual. A superior has also a hypothec for his feu-duty, of the same kind with that just explained.

24. In tacks of houses, breweries, shops, and other tenements, which have no natural fruits, the furniture and other goods brought into the subject are hypothecated to the landlord for one year's rent. But the tenant may by sale impair this hypothec, as he might that of cattle in rural tenements; and indeed, in the particular case of a shop, the tenant rents it for no other purpose than as a place of sale.

clxviii. SECT. VII. *Of the transmission of rights, by confirmation and resignation.*

Transmission of  
feudal rights.

A *FASSAL* may transmit his feu either to universal successors, as heirs; or to singular successors, *i. e.* those who acquire by gift, purchase, or other singular title. This last sort of transmission is either voluntary, by disposition; or necessary, by adjudication.

2. By the first feudal rules, no superior could be compelled to receive any vassal in the lands, other than the heir expressed in the investiture; for the superior alone had the power of ascertaining to what order of heirs the fee granted by himself was to descend. But this right of refusal in the superior did not take place, (1.) In the case of creditors appraisers or adjudgers, whom superiors were obliged to receive upon payment of a year's rent. (2.) In the case of purchasers of bankrupt estates, who were put on the same footing with adjudgers. The crown refuses no voluntary dispositive, on his paying a composition to the exchequer of a sixth part of the valued rent. Now superiors are directed to enter all singular successors (except incorporations) who shall have got from the vassal a disposition, containing procuratory of resignation; they always receiving the fees or casualties that law entitles them to on a vassal's entry, *i. e.* a year's rent.

Base rights.

3. *Base rights, i. e.* dispositions to be holden of the dispositive, are transmissions only of the property, the superiority remaining as formerly. As this kind of right might, before establishing the registers, have been kept quite concealed from all but the grantor and receiver, a public right was preferable to it, unless clothed with possession: but as this distinction was no longer necessary after the establishment of the records, all investments are declared preferable, according to the dates of their several registrations; without respect to the former distinction of base and public, or of being clothed and not clothed with possession.

Public  
rights.

4. *Public rights, i. e.* dispositions to be holden of the grantor's superior, may be perfected either by confirmation or resignation; and therefore, they generally contain both precept of seisin and procuratory of resignation. When the receiver is to complete his right in

the first way, he takes seisin upon the precept: but such seisin is ineffectual without the superior's confirmation; for the dispositive cannot be deemed a vassal, till the superior receive him as such, or confirm the holding. By the usual style in the transmission of lands, the disposition contains an obligation and precept of investiture, both a *me* and *de me*, in the option of the dispositive; upon which, if seisin is taken indefinitely, it is construed in favour of the dispositive to be a base investment, because a public right is null without confirmation: but, if the receiver shall afterwards obtain the superior's confirmation, it is considered as if it had been from the beginning a public right.

Preference  
in confirma-  
tion.

5. Where two several public rights of the same subject are confirmed by the superior, their preference is governed by the dates of the confirmations, not of the investments confirmed; because it is the confirmation which completes a public right.

6. Though a public right becomes, by the superior's confirmation, valid from its date; yet if any mid impediment intervene betwixt that period and the confirmation, to hinder the two from being conjoined, *e. g.* if the grantor of a public right should afterwards grant a base right to another, upon which seisin is taken before the superior's confirmation of the first, the confirmation will have effect only from its own date; and consequently the base right first completed, will carry the property of the lands preferable to the public one.

7. Resignation is that form of law, by which a vassal surrenders his feu to his superior; and it is either *ad perpetuum remanentiam*, or *in favorem*. In resignations *ad remanentiam*, where the feu is resigned, to the effect that it may remain with the superior, the superior, who before had the superiority, acquires, by the resignation, the property also of the lands resigned: and as his investment in the lands still subsisted, notwithstanding the right by which he had given his vassal the property; therefore, upon the vassal's resignation, the superior's right of property revives, and is consolidated with the superiority, without the necessity of a new investment; but the instrument of resignation must be recorded.

Resigna-  
tions.

8. Resignations *in favorem* are made, not with an intention that the property resigned should remain with the superior, but that it should be again given by him, in favour either of the resigner himself, or of a third party; consequently the fee remains in the resigner, till the person in whose favour resignation is made gets his right from the superior perfected by seisin. And because resignations *in favorem* are but incomplete personal deeds, our law has made no provision for recording them. Hence, the first seisin on a second resignation is preferable to the last seisin upon the first resignation; but the superior, accepting a second resignation, whereupon a prior seisin may be taken in prejudice of the first resignatory, is liable in damages.

9. By our former decisions, one who was vested with a personal right of lands, *i. e.* a right not completed by seisin, effectually divested himself by disposing it to another; after which, no right remained in the dispositive, which could be carried by a second disposition, because a personal right is no more than a *jus obligatio- nis*, which may be transferred by any deed sufficiently expressing the will of the grantor. But this doctrine, at the same time that it rendered the security of the records extremely uncertain, was not truly applicable to such

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fuch rights as required feisin to complete them; and therefore it now obtains, that the grantor even of a personal right of lands, is not so divested by conveying the right to one person, but that he may effectually make it over afterwards to another; and the preference between the two does not depend on the dates of the dispositions, but on the priority of the feisins following upon them.

### SECT. VIII. Of Redeemable Rights.

AN heritable right is said to be redeemable, when it contains a right of reversion, or return, in favour of the person from whom the right flows. Reversions are either legal, which arise from the law itself, as in adjudications, which law declares to be redeemable within a certain term after their date; or conventional, which are constituted by the agreement of parties, as in wadsets, rights of annualrent, and rights in security. A wadset (from wad or pledge) is a right, by which lands, or other heritable subjects, are impignored by the proprietor to his creditor, in security of his debt; and, like other heritable rights, is perfected by feisin. The debtor, who grants the wadset, and has the right of reversion, is called the reverfer; and the creditor, receiver of the wadset, is called the wadsetter.

2. Wadsets, by the present practice, are commonly made out in the form of mutual contracts, in which one party sells the land, and the other grants the right of reversion. When the right of reversion is thus incorporated in the body of the wadset, it is effectual without registration; because the singular successor in the wadset is, in that case, sufficiently certified of the reversion, though it be not registered, by looking into his own right, which bears it *in gremio*. But where the right of reversion is granted in a separate writing, it is ineffectual against the singular successor of the wadsetter, unless it be registered in the register of feisins within 60 days after the date of the feisin upon the wadset.

3. Rights of reversion are generally esteemed *stricti juris*; yet they go to heirs, though heirs should not be mentioned, unless there be some clause in the right, discovering the intention of parties, that the reversion should be personal to the reverfer himself. In like manner, though the right should not express a power to redeem from the wadsetter's heir, as well as from himself, redemption will be competent against the heir. All our lawyers have affirmed, that reversions cannot be assigned, unless they are taken to assignees; but from the favour of legal diligence, they may be adjudged.

4. Reversions commonly leave the reverfer at liberty to redeem the lands *quandocunque*, without restriction in point of time; but a clause is adjoined to some reversions, that if the debt be not paid against a determined day, the right of reversion shall be irritated, and the lands shall become the irredeemable property of the wadsetter. Nevertheless, the irritancy being penal, as in wadsets, the sum lent falls always short of the value of the lands, and the right of redemption is by indulgence continued to the reverfer, even after the term has expired, while the irritancy is not declared. But the reverfer, if he does not take the benefit of this indulgence within 40 years after the lapse of the term, is

cut out of it by prescription.

5. If the reverfer would redeem his lands, he must use an order of redemption against the wadsetter: the first step of which is premonition (or notice given under form of instrument) to the wadsetter, to appear at the time and place appointed by the reverfer, then and there to receive payment of his debt, and thereupon to renounce his right of wadset. In the voluntary redemption of a right of wadset holden base, a renunciation duly registered re-establishes the reverfer in the full right of the lands. Where the wadset was granted to be holden of the grantor's superior, the superior must receive the reverfer, on payment of a year's rent, if he produce a disposition from the wadsetter, containing procuratory of resignation. If, at executing the wadset, the superior has granted letters of regrefs, *i. e.* an obligation again to enter the reverfer upon redemption of the lands, he will be obliged to receive him, without payment of the year's rent. But letters of regrefs will not have this effect against singular successors in the superiority, if they are not registered in the register of reversions. All wadsets that remain personal rights, are extinguished by simple discharges, though they should not be recorded.

6. If the wadsetter either does not appear at the time and place appointed, or refuses the redemption-money, the reverfer must consign it under form of instrument, in the hands of the person thereto appointed in the right of reversion; or, if no person be named, in the hands of the clerk to the bills, a clerk of session, or any responal person. An instrument of consignation, with the consignatory's receipt of the money consigned, completes the order of redemption, stops the farther currency of interest against the reverfer, and founds him in an action for declaring the order to be formal, and the lands to be redeemed in consequence of it.

7. After decree of declarator is obtained, by which the lands are declared to return to the debtor, the consigned money, which comes in place of the lands, becomes the wadsetter's, who therefore can charge the consignatory upon letters of horning to deliver it up to him; but, because the reverfer may, at any time before decree, pass from his order, as one may do from any other step of diligence, the consigned sums continue to belong to the reverfer, and the wadsetter's interest in the wadset continues heritable till that period.

8. If the wadsetter chuses to have his money rather than the lands, he must require from the reverfer, under form of instrument, the sums due by the wadset, in terms of the right. The wadset sums continue heritable, notwithstanding requisition, which may be passed from by the wadsetter even after the reverfer has consigned the redemption-money in consequence thereof.

9. Wadsets are either proper or improper. A proper wadset is that whereby it is agreed, that the use of the land shall go for the use of the money; so that the wadsetter takes his hazard of the rents, and enjoys them without accounting, in satisfaction, or *in solutum* of his interest.

10. In an improper wadset, the reverfer, if the rent should fall short of the interest, is taken bound to make up the deficiency; if it amounts to more, the wadsetter is obliged to impute the excrecence towards extinction

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of the capital: And, as soon as the whole sum, principal and interest, are extinguished by the wadsetter's possession, he may be compelled to renounce, or divest himself in favour of the reverser.

11. If the wadsetter be intitled by his right to enjoy the rents without accounting, and if at the same time the reverser be subjected to the hazard of their deficiency, such contract is justly declared usurious: and also in all proper wadsets wherein any unreasonable advantage has been taken of the debtor, the wadsetter must, during the not requisition of the sum lent, either quit his possession to the debtor, upon his giving security to pay the interest, or subject himself to account for the surplus-rents, as in improper wadsets.

Right of annualrent.

12. Infeftments of annualrent, the nature of which has been explained, are also redeemable rights. A right of annualrent does not carry the property of the lands; but it creates a real *nexus* or burden upon the property, for payment of the interest or annualrent contained in the right; and consequently the bygone interests due upon it are *debita fundi*. The annual-renter may therefore either insist in a real action for obtaining letters of poiding the ground, or sue the tenant in a personal action towards the payment of his past interest: and in a competition for those rents, the annual-renter's preference will not depend on his having used a poiding of the ground, for his right was completed by the feisin; and the power of poiding the ground, arising from that antecedent right, is *meræ facultatis*, and need not be exercised, if payment can be otherwise got. As it is only the interest of the sum lent which is a burden upon the lands, the annual-renter, if he wants his principal sum, cannot recover it either by poiding or by a personal action against the debtor's tenants; but must demand it from the debtor himself, on his personal obligation in the bond, either by requisition, or by a charge upon letters of horning, according as the right is drawn.

13. Rights of annualrent, being servitudes upon the property, and consequently consistent with the right of property in the debtor, may be extinguished without resignation.

Rights of security.

14. Infeftments in security are another kind of redeemable rights (now frequently used in place of rights of annualrent, by which the receivers are infeft in the lands themselves, and not simply in an annualrent forth of them, for security of the principal sum, interest, and penalty, contained in the rights. If an infeftment in security be granted to a creditor, he may thereupon enter into the immediate possession of the lands or annualrent for his payment. They are extinguished as rights of annualrent.

15. All rights of annualrent, rights in security, and generally whatever constitutes a real burden on the fee, may be the ground of an adjudication, which is preferable to all adjudications, or other diligences, intervening between the date of the right and of the adjudication deduced on it; not only for the principal sum contained in the right, but also for the whole past interest contained in the adjudication. This preference arises from the nature of real debts, or *debita fundi*: but in order to obtain it for the interest of the interest accumulated in the adjudication, such adjudication must proceed on a process of poiding the ground.

## SECT. IX. Of Servitudes.

SERVITUDE is a burden affecting lands, or other heritable subjects, whereby the proprietor is either restrained from the full use of what is his own, or is obliged to suffer another to do something upon it. Servitudes are either natural, legal, or conventional. Nature itself may be said to constitute a servitude upon inferior tenements, whereby they must receive the water that falls from those that stand on higher ground. Legal servitudes are established by statute or custom, from considerations of public policy; among which may be numbered the restraints laid upon the proprietors of tenements within the city of Edinburgh. There is as great a variety of conventional servitudes, as there are ways by which the exercise of property may be restrained by paction in favour of another.

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Different  
kinds of  
servitude.

2. Conventional servitudes are constituted, either by grant, where the will of the party burdened is expressed in writing; or by prescription, where his consent is presumed from his acquiescence in the burden for 40 years. A servitude constituted by writing, or grant, is not effectual against the grantor's singular successors, unless the grantee has been in the use or exercise of his right; but they are valid against the grantor and his heirs, even without use. In servitudes that may be acquired by prescription, 40 years exercise of the right is sufficient, without any title in writing, other than a charter and feisin of the lands to which the servitude is claimed to be due.

3. Servitudes constituted by grant are not effectual, in a question with the superior of the tenement burdened with the servitude, unless his consent be adhibited; for a superior cannot be hurt by his vassal's deed: but where the servitude is acquired by prescription, the consent of the superior, whose right afforded him a good title to interrupt, is implied. A servitude by grant, though followed only by a partial possession, must be governed, as to its extent, by the tenor of the grant; but a servitude by prescription is limited by the measure or degree of the use had by him who prescribes: agreeably to the maxim, *tantum præscriptum quantum possessum*.

4. Servitudes are either predial or personal. Predial servitudes are burdens imposed upon one tenement, in favour of another tenement. That to which the servitude is due is called the *dominant*, and that which owes it is called the *servient tenement*. No person can have right to a predial servitude, if he is not proprietor of some dominant tenement that may have benefit by it; for that right is annexed to a tenement, and so cannot pass from one person to another, unless some tenement goes along with it.

Predial servitudes.

5. Predial servitudes are divided into *rural* servitudes, or of lands; and *urban* servitudes, or of houses. The rural servitudes of the Romans were *iter*, *actus*, *via*, *aquæductus*, *aquæhæusus*, and *jus pascendi pecoris*. Similar servitudes may be constituted with us, of a foot-road, horse-road, cart-road, dams, and aqueducts, watering of cattle, and pasturage. The right of a highway is not a servitude constituted in favour of a particular tenement, but is a right common to all travellers. The care of high-ways, bridges, and ferries, is committed to the sheriffs, justices of peace, and commissioners of supply in each shire.

Rural servitudes.

6. Common pasturage, or the right of feeding one's cattle upon the property of another, is sometimes constituted by a general clause of pasturage in a charter or disposition, without mentioning the lands burdened; in which case, the right comprehends whatever had been formerly appropriated to the lands disposed out of the grantor's own property, and likewise all pasturage due to them out of other lands. When a right of pasturage is given to several neighbouring proprietors, on a moor or common belonging to the grantor, indefinite as to the number of cattle to be pastured, the extent of their several rights is to be proportioned according to the number that each of them can fodder in winter upon his own dominant tenement.

urban ser-  
vitudes.

7. The chief servitudes of houses among the Romans were those of support, viz. *tigni immittendi*, and *oneris ferendi*. The first was the right of fixing in our neighbour's wall a joist or beam from our house: the second was that of resting the weight of one's house upon his neighbour's wall.

8. With us, where different floors or stories of the same house belong to different persons, as is frequent in the city of Edinburgh, the property of the house cannot be said to be entirely divided; the roof remains a common roof to the whole, and the area on which the house stands supports the whole; so that there is a communication of property, in consequence of which the proprietor of the ground-floor must, without the constitution of any servitude, uphold it for the support of the upper, and the owner of the highest story must uphold that as a cover to the lower. When the highest floor is divided into garrets among the several proprietors, each proprietor is obliged, according to this rule, to uphold that part of the roof which covers his own garret.

9. No proprietor can build, so as to throw the rain-water falling from his own house, immediately upon his neighbour's ground, without a special servitude, which is called *stillicide*; but, if it falls within his own property, though at the smallest distance from the march, the owner of the inferior tenement must receive it.

10. The servitudes *altius non tollendi*, et *non officiendi luminibus vel prospectui*, restrain proprietors from raising their houses beyond a certain height, or from making any building whatsoever that may hurt the light or prospect of the dominant tenement. These servitudes cannot be constituted by prescription alone: for, though a proprietor should have his house ever so low, or should not have built at all upon his grounds for 40 years together, he is presumed to have done so for his own convenience or profit; and therefore cannot be barred from afterwards building a house on his property, or raising it to what height he pleases, unless he be tied down by his own consent.

servitude of  
al and di-  
pt.

11. We have two predial servitudes to which the Romans were strangers, viz. that of sewel or seal and divot, and of thirlage. The first is a right, by which the owner of the dominant tenement may turn up peats, turfs, seals, or divots, from the ground of the servient, and carry them off either for sewel, or thatch, or the other uses of his own tenement.

thirlage.

12. THIRLAGE is that servitude, by which lands arestricted, or thirled, to a particular mill; and the possessors bound to grind their grain there, for payment

of certain multures and sequels as the agreed price of grinding. In this servitude, the mill is the dominant tenement, and the lands restricted (which are called also the *thirl* or *fucken*) the servient. Multure is the quantity of grain or meal payable to the proprietor of the mill, or to the multurer his tackman. The sequels are the small quantities given to the servants, under the name of *knave'ship*, *bannock*, and *lock* or *gowpen*. The quantities paid to the mill by the lands not restricted, are generally proportioned to the value of the labour, and are called *out-town* or *out-fucken multures*; but those paid by the thirl are ordinarily higher, and are called *in-town* or *in-fucken multures*.

13. Thirlage may be constituted by a land-holder, when, in the disposition of certain lands, he restricts them to his own mill; or when, in the disposition of a mill, he restricts his own lands to the mill disposed; or when, in letting his lands, he makes it a condition in the tacks. The grant of a mill with the general clause of multures, without specifying the lands restricted, conveys the thirlage of all the lands formerly restricted to that mill, whether they were the property of the grantor, or of a third party.

14. A less formal constitution serves to restrict barony-lands to the mill of the barony, than is necessary in any other thirlage; which perhaps proceeds from the effects of the union betwixt the two. Hence, if a baron makes over the mill of a barony, *cum multuris*, or *cum restrictis multuris*, it infers an restriction of the barony lands to the mill conveyed, even of such as had been before sold to another for a certain duty *pro omni alio onere*. But if, prior to the baron's conveyance of his mill *cum multuris*, he had sold any part of the barony-lands to another *cum multuris*, the first purchaser's lands are not restricted by the posterior grant; for a right of lands with the multures, implies a freedom of these lands from thirlage.

15. Thirlage is either, 1. Of grindable corns; or, 2. Of all growing corns; or, 3. Of the *investa et illata*, i. e. of all the grain brought within the thirl, though of another growth. Where the thirlage is of grindable grain, it is in practice restricted to the corns which the tenants have occasion to grind, either for the support of their families, or for other uses; the surplus may be carried out of the thirl unmanufactured, without being liable in multure. Where it is of the *grana crescentia*, the whole grain growing upon the thirl is restricted, with the exceptions, 1. Of seed and horse-corn, which are destined to uses inconsistent with grinding; and, 2. Of the farm-duties due to the landlord, if they are delivered in grain not grinded. But, if the rent be payable in meal, flour, or malt, the grain of which these are made must be manufactured in the dominant mill.

16. The thirlage of *investa et illata* is seldom constituted but against the inhabitants of a borough or village, that they shall grind all the unmanufactured grain they import thither at the dominant mill. Multure, therefore, cannot be exacted in a thirlage of *investa et illata*, for flour or oat-meal brought into the servient tenement, unless the importer had bought it in grain, and grinded it at another mill. The same grain that owes multure, as *granum crescent*, to the mill in whose thirl it grew, if it shall be afterwards brought within a borough where the *investa et illata* are thirled, must pay

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a second culture to the proprietor of that dominant tenement; but, where the right of these two thirlages is in the same proprietor, he cannot exact both. Where lands are thirled in general terms, without expressing the particular nature of the servitude, the lightest thirlage is presumed, from the favour of liberty; but in the strictness of a borough or village, where there is no growing grain which can be the subject of thirlage, the strictness of *inveſta et illata* must be necessarily understood.

17. Thirlage, in the general case, cannot be established by prescription alone, for *iis que sunt mæra facultatis non præſcribitur*; but where one has paid for 40 years together the heavy infucken multures, the slightest title in writing will subject his lands. Thirlage may be, contrary to the common rule, constituted by prescription alone, 1. Where one pays to a mill a certain sum, or quantity of grain yearly, in name of culture, whether he grinds at it or not, (called *dry multures*.) 2. In mills of the king's property; which is constituted *jure corone*, without titles in writing; and, where he derives right from another, his titles are more liable to be lost. This is extended in practice to mills belonging to church-lands, where 30 years possession is deemed equivalent to a title in writing, from a presumption that their rights were destroyed at the reformation. Though thirlage itself cannot be constituted by mere possession, the proportion of culture payable to the dominant tenement may be so fixed.

18. The possessors of the lands affected, are bound to uphold the mill, repair the dam-dykes and aqueducts, and bring home the millstones. These services, though not expressed in the constitution, are implied.

Servitudes are stricti juris.

19. Servitudes, being restraints upon property, are *stricti juris*: they are not therefore presumed, if the acts upon which they are claimed can be explained consistently with freedom; and, when servitudes are constituted, they ought to be used in the way least burdensome to the servient tenement. Hence, one who has a servitude of peats upon his neighbour's moor, is not at liberty to extend it for the use of any manufacture which may require an extraordinary expence of fuel; but must confine it to the natural uses of the dominant tenement.

20. Servitudes are extinguished, (1.) *Confusione*, when the person comes to be proprietor of the dominant and servient tenements; for *res sua nemini servit*, and the use the proprietor thereafter makes of the servient tenement is not *jure servitutis*, but is an act of property. (2.) By the perishing either of the dominant or servient tenement. (3.) Servitudes are lost *non utendo*, by the dominant tenement neglecting to use the right for 40 years; which is considered as a dereliction of it, though he who has the servient tenement should have made no interruption by doing acts contrary to the servitude.

Liferent.

21. Personal servitudes are those by which the property of a subject is burdened, in favour, not of a tenement, but of a person. The only personal servitude known in our law, is usufruct or liferent; which is a right to use and enjoy a thing during life, the substance of it being preserved. A liferent cannot therefore be constituted upon things which perish in the use; and though it may upon subjects which gradual-

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Liferents.

ly wear out by time, as household furniture, &c. yet, with us, it is generally applied to heritable subjects. He whose property is burdened, is usually called the *fiar*.

22. Liferents are divided into conventional and legal. Conventional liferents are either simple, or by reservation. A simple liferent, or by a separate constitution, is that which is granted by the proprietor in favour of another: And this sort, contrary to the nature of predial servitudes, requires seisin in order to affect singular successors; for a liferent of lands is, in strict speech, not a servitude, but a right resembling property which constitutes the liferenter vassal for life; and singular successors have no way of discovering a liferent-right, which perhaps is not yet commenced, but by the records; whereas, in predial servitudes the constant use of the dominant tenement makes them public. The proper right of liferent is intransmissible, *offibus usufructuarii inheret*: When the profits of the liferented subject are transmitted to another, the right becomes merely personal: for it intitles the assignee to the rent, not during his own life, but his cedent's; and is therefore carried by simple assignation, without seisin.

23. A liferent by reservation, is that which a proprietor reserves to himself in the same writing by which he conveys the fee to another. It requires no seisin; for the grantor's former seisin, which virtually included the liferent, still subsists as to the liferent which is expressly reserved. In conjunct indentments taken to husband and wife, the wife's right of conjunct fee resolves, in the general case, into a liferent.

Terce.

24. Liferents by law, are the terce and the courtship. The terce (*tertia*) is a liferent competent by law to widows, who have not accepted of special provisions, in the third of the heritable subjects in which their husbands died infest; and takes place only where the marriage has subsisted for year and day, or where a child has been born alive of it.

25. The terce is not limited to lands, but extends to tenants, and to servitudes and other burdens affecting lands; thus, the widow is intitled, in the right of her terce, to a liferent of the third of the sums secured, either by rights of annualrent, or by rights in security. In improper wadsets, the terce is a third of the sum lent: In those that are proper, it is a third of the wadset lands; or, in case of redemption, a third of the redemption money. Neither rights of reversion, superiority, nor patronage, fall under the terce; for none of these have fixed profits, and so are not proper subjects for the widow's subsistence; nor tacks, because they are not feudal rights. Burgage-tenements are also excluded from it, the reason of which is not so obvious. Since the husband's seisin is both the measure and security of the terce, such debts or diligences alone, as exclude the husband's seisin, can prevail over it.

26. Where a terce is due out of lands burdened with a prior terce still subsisting, the second terce has only right to a third of the two thirds that remain unaffected by the first terce. But upon the death of the first widow, whereby the lands are disburdened of her terce, the lesser terce becomes enlarged, as if the first had never existed. A widow, who has accepted of a special provision from her husband, is thereby excluded from the terce, unless such provision shall contain a clause that she shall have right to both.



27. The widow has no title of possession, and so cannot receive the rents in virtue of her terre, till she be served to it; and in order to this, she must obtain a brief out of the chancery, directed to the Sheriff, who calls an inquest, to take proof that she was wife to the deceased, and that the deceased died seised in the subjects contained in the brief. The service or sentence of the jury, finding these points proved, does, without the necessity of a return to the chancery, entitle the wife to enter into the possession; but she can only possess with the heir *pro indiviso*, and so cannot remove tenants, till the sheriff kens her to her terre, or divides the lands between her and the heir. In this division, after determining by lot or kaval, whether to begin by the sun or the shade, *i. e.* by the east or the west, the sheriff sets off the two first acres for the heir, and the third part for the widow. Sometimes the division is executed, by giving one entire farm to the widow, and two of equal value to the heir. The widow's right is not properly constituted by this service; it was constituted before by the husband's seisin, and fixed by his death; the service only declares it, and so entitles her to the third part of the rents *retro* to her husband's death, preferable to any rights that may have affected the lands in the intermediate period between that and her own service. The relic, if she was reputed to be lawful wife to the deceased, must be served, notwithstanding any objections by the heir against the marriage, which may be afterwards tried by the commissary.

Courtsey.

28. Courtsey is a liferent given by law, to the surviving husband, of all his wife's heritage in which she died seised, if there was a child of the marriage born alive. A marriage, though of the longest continuance, gives no right to the courtsey, if there was no issue of it. The child born of the marriage must be the mother's heir: If she had a child of the former marriage, who is to succeed to her estate, the husband has no right to the courtsey while such child is alive; so that the courtsey is due to the husband, rather as father to an heir, than as husband to an heiress. Heritage is here opposed to conquest; and so is to be understood only of the heritable rights to which the wife succeeded as heir to her ancestors, excluding what she herself had acquired by singular titles.

29. Because the husband enjoys the life-rent of his wife's whole heritage, on a lucrative title, he is considered as her temporary representative; and so is liable in payment of all the yearly burdens chargeable on the subject, and of the current interest of all her debts, real and personal, to the value of the yearly rent he enjoys by the courtsey. The courtsey needs no solemnity to its constitution: That right, which the husband had to the rents of his wife's estate, during the marriage, *jure mariti*, is continued with him after her death, under the name of courtsey, by an act of the law itself. As in the terre, the husband's seisin is the ground and measure of the wife's right; so in the courtsey, the wife's seisin is the foundation of the husband's; and the two rights are, in all other respects, of the same nature; if it is not that the courtsey extends to burghage holdings, and to superiorities.

30. All liferenters must use their right *salva rei substantia*: whatever therefore is part of the fee itself, cannot be encroached on by the liferenter, *e. g.* woods or growing timber, even for the necessary uses of the

liferented tenement. But, where a coppice or *silva cadua* has been divided into hags, one of which was in use to be cut annually by the proprietor, the liferenter may continue the former yearly cuttings; because these are considered as the annual fruits the subject was intended to yield, and so the proper subject of a liferent.

31. Liferenters are bound to keep the subject liferented in proper repair. They are also burdened with the alimony of the heir, where he has not enough for maintaining himself. The bare right of apparency founds the action against the liferenter. It is a burden personal to the liferenter himself, and cannot be thrown upon his adjoining creditors as coming in his place by their diligences. Liferenters are also subjected to the payment of the yearly cesses, stipends, &c. falling due during their right, and to all other burdens that attend the subject liferented.

32. Liferent is extinguished by the liferenter's death. That part of the rents which the liferenter had a proper right to, before his death, falls to his executors; the rest, as never having been *in bonis* of the deceased, goes to the heir. Martinmas and Whitsunday are, by our custom, the legal terms of the payment of rent: consequently, if a liferenter of lands survives the term of Whitsunday, his executors are entitled to the half of that year's rent, because it was due the term before his death; and if he survives the Martinmas, they have right to the whole. If the liferenter, being in the natural possession, and having first sowed the ground, should die, even before the Whitsunday, his executors are intitled to the whole crop, in respect that both seed and industry were his. In a liferent of money constituted by a moveable bond, the executors have a right to the interest, down to the very day of the liferenter's death, where no terms are mentioned for the payment thereof; but in the case of an heritable bond, or of a money liferent secured on land, the interests of liferenter and heir (or of heir and executor, for the same rules serve to fix the interests of both) are both governed by the legal terms of land-rent, without regard to the conventional.

#### SECT. X. Of Teinds.

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Teinds.

TEINDS, or tithes, are that liquid proportion of our rents or goods, which is due to churchmen, for performing divine service, or exercising the other spiritual functions proper to their several offices. Most of the canonists assign, that, the precise proportion of a tenth, not only of the fruits of the ground, but of what is acquired by personal industry, is due to the Christian clergy, of divine right, which they therefore call the *proper patrimony of the church*; though it is certain that tithes, in their infancy, were given, not to the clergy alone, but to lay-monks who were called *pauperes*, and to other indigent persons. Charles the Great was the first secular prince who acknowledged this right in the church. It appears to have been received with us, as far back as David I.

2. The person employed by a cathedral church or monastery to serve the cure in a church annexed, was called a vicar, because he held the church, not in his own right, but in the right or *vice* of his employers; and so was removeable at pleasure, and had no share of the benefice, other than what they thought fit

to

to allow him: but, in the course of time, the appellation of *vicar* was limited to those who were made perpetual, and who got a stated share of the benefice for their incumbency; from whence arose the distinction of benefices into parsonages and vicarages.

3. Parsonage teinds are the teinds of corn; and they are so called because they are due to the parson or other titular of the benefice. Vicarage teinds are the small teinds of calves, lint, hemp, eggs, &c. which were commonly given by the titular to the vicar who served the cure in his place. The first sort was universally due, unless in the case of their infestation to laics, or of a pontifical exemption; but, by the customs of almost all Christendom, the lesser teinds were not demanded where they had not been in use to be paid. By the practice of Scotland, the teinds of animals, or of things produced from animals, as lambs, wool, calves, are due though not accustomed to be paid; but roots, herbs, &c. are not tithable, unless use of payment be proved: neither are personal teinds, *i. e.* the tenth of what one acquires by his own industry, acknowledged by our law: yet they have been found due, when supported by 40 years possession.

4. The parson who was entitled to the teind of corns, made his right effectual, either by accepting of a certain number of teind-bolls yearly from the proprietor in satisfaction of it; or, more frequently, by drawing or separating upon the field his own tenth part of the corns, after they were reaped, from the flock or the remaining nine tenths of the crop, and carrying it off to his own granaries; which is called *drawn teind*.

Annexation  
of church-  
lands to the  
crown.

5. After the reformation, James VI. considered himself as proprietor of all the church-lands; partly because the purposes for which they had been granted were declared superstitious; and partly, in consequence of the resignations which he, and queen Mary his mother, had procured from the beneficiaries: and even as to the teinds, though our reformed clergy also claimed them as the patrimony of the church, our sovereign did not submit to that doctrine farther than extended to a competent provision for ministers. He therefore erected or secularised several abbacies and priories into temporal lordships; the grantees of which were called sometimes *lords of erection*, and sometimes *titulars*, as having by their grants the same title to the erected benefices that the monasteries had formerly.

6. As the crown's revenue suffered greatly by these erections, the temporality of all church benefices (*i. e.* church lands) was, by 1587. c. 29. annexed to the crown. That statute excepts from the annexation such benefices as were established before the reformation in laymen, whose rights the legislature had no intention to weaken. Notwithstanding this statute, his majesty continued to make farther erections, which were declared null by 1592. c. 119. with an exception of such as had been made in favour of lords of parliament since the general act of annexation in 1587.

7. King Charles I. soon after his succession, raised a reduction of all these erections, whether granted before or after the act of annexation, upon the grounds mentioned at length by Mr Forbes in his treatise of tithes, p. 259. At last the whole matter was referred to the king himself by four several submissions or compromises; in which the parties on one side were the titulars and their tacksmen, the bishops with the inferior

clergy, and the royal boroughs, for the interest they had in the teinds that were gifted for the provision of ministers, schools, or hospitals within their boroughs; and, on the other part, the proprietors who wanted to have the leading of their own teinds. The submission by the titulars contained a surrender into his majesty's hands of the superiorities of their several erections.

Valuation  
of teinds.

8. Upon each of these submissions his majesty pronounced separate decrees-arbitral, dated Sept. 2. 1629, which are subjoined to the acts of parliament of his reign. He made it lawful to proprietors to sue the titulars for a valuation, and if they thought fit for a sale also, of their teinds, before the commissioners named or to be named for that purpose. The rate of teind, when it was possessed by the proprietor jointly with the flock, for payment of a certain duty to the titular, and so did not admit a separate valuation, was fixed at a fifth part of the constant yearly rent, which was accounted a reasonable *surrogatum*, in place of a tenth of the increase. Where it was drawn by the titular, and consequently might be valued separately from the flock, it was to be valued as its extent should be ascertained upon a proof before the commissioners; but in this last valuation, the king directed the fifth part to be deducted from the proved teind, in favour of the proprietor, which was there called the *king's ease*. The proprietor suing for a valuation gets the leading of his own teinds as soon as his suit commences, providing he does not allow protestation to be extracted against him for not insinuing.

9. Where the proprietor insisted also for a sale of his teinds, the titular was obliged to sell them at nine years purchase of the valued teind-duty. If the pursuer had a tack of his own teinds, not yet expired; or if the defender was only tacksmen of the teinds, and so could not give the pursuer an heritable right; an abatement of the price was to be granted accordingly by the commissioners.

10. There is no provision in the decrees-arbitral, for selling the teinds granted for the sustentation of ministers, universities, schools, or hospitals; because these were to continue, as a perpetual fund, for the maintenance of the persons or societies to whom they were appropriated; and they are expressly declared not subject to sale, by 1690. c. 30.—1693. c. 23. By the last of these acts, it is also provided, that the teinds belonging to bishops, which had then fallen to the crown upon the abolishing of episcopacy, should not be subject to sale as long as they remained with the crown not disposed of; nor those which the proprietor, who had right both to flock and teind, referred to himself in a sale or feu of the lands. But, though none of these teinds can be sold, they may be valued.

11. The king, by the decrees arbitral, declared his own right to the superiorities of erection which had to be resigned to him by the submission, referring to the titulars the feu-duties thereof, until payment by himself to them of 1000 merks Scots for every chaldor of feu-victual, and for each hundred merks of feu-duty; which right of redeeming the feu-duties was afterwards renounced by the crown. If the church-vassal should consent to hold his lands of the titular, he cannot thereafter recur to the crown as his immediate superior.

King's right  
to the superi-  
orities of  
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12. In explaining what the constant rent is by which

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which the teind must be valued, the following rules are observed. The rent drawn by the proprietor, from the sale of subjects, that are more properly parts of the land than of the fruits, *e.g.* quarries, minerals, mosses, &c. is to be deducted from the rental of the lands; and also the rent of supernumerary houses, over and above what is necessary for agriculture; and the additional rent that may be paid by the tenant, in consideration of the proprietor's undertaking any burden that law imposes on the tenant, *e.g.* upholding the tenant's houses, because none of these articles are paid properly on account of the fruits. Orchards must also be deducted, and mill-rent, because the profits of a mill arise from industry; and the corns manufactured there suffer a valuation as rent payable by the tenant, and therefore ought not to be valued a second time against the titular as mill-rent. The yearly expence of culture ought not to be deducted; for no rent can be produced without it: but, if an improvement of rent is made at an uncommon expence, *e.g.* by draining a lake, the proprietor is allowed a reasonable abatement on that account.

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nable.

13. Notwithstanding the several ways of misapplying parochial teinds in the times of popery, some few benefices remained entire in the hands of the parsons. The ministers planted in these, after the reformation, continued to have the full right to them, as proper beneficiaries: but a power was afterwards granted to the patron, to redeem the whole teind from such beneficiaries, upon their getting a competent stipend modified to them; which teind so redeemed, the patron is obliged to sell to the proprietor, at six years purchase.

14. Some teinds are more directly subject to an allocation for the minister's stipend, than others. The teinds, in the hands of the lay titular, fall first to be allocated, who, since he is not capable to serve the cure in his own person, ought to provide one who can; and if the titular, in place of drawing the teind, has set it in tack, the tack-duty is allocated: this sort is called *free teind*. Where the tack-duty, which is the titular's interest in the teinds, falls short, the tack itself is burdened, or, in other words, the surplus teind over and above the tack-duty: but, in this case, the commissioners are empowered to recompense the tackfman, by prorogating his tack for such a number of years as they shall judge equitable. Where this likewise proves deficient, the allocation falls on the teinds heritably conveyed by the titular, unless he has warranted his grant against future augmentations; in which case, the teinds of the lands belonging in property to the titular himself must be allocated in the first place.

15. Where there is sufficiency of free teinds in a parish, the titular may allocate any of them he shall think fit for the minister's stipend, since they are all his own; unless there has been a previous decree of locality: and this holds, though the stipend should have been paid immemorially out of the teinds of certain particular lands. This right was frequently abused by titulars, who, as soon as a proprietor had brought an action of sale of his teinds, allocated the pursuer's full teind for the stipend, whereby such action became ineffectual: it was therefore provided, that after citation in a sale of teinds it shall not be in the titular's power to allocate the pursuer's teinds solely, but only in proportion with the other teinds in the parish.

16. Ministers glebes are declared free from the payment of teind. Lands *cum decimis inclusis* are also exempted from teind. But in order to exempt lands from payment of teind, it is necessary that the proprietor prove his right thereto, *cum decimis inclusis*, as far back as the above act of annexation 1587.

Law of  
Scotland.  
Ministers,  
glebes, &c.  
exempted  
from teinds.

17. Teinds are *debita fructuum, not fundi*. The action therefore for bygone teinds is only personal, against those who have intermeddled, unless where the titular is seised in the lands, in security of the valued teind-duty. Where a tenant is, by his tack, bound to pay a joint duty to the landlord for stock and teind, without distinguishing the rent of each, his defence of a *bona fide* payment of the whole to the landlord has been sustained in a suit at the instance of a laic titular, but repelled where a churchman was pursuer. In both cases the proprietor who receives such rent is liable as intermeddler.

18. In tacks of teinds, as of lands, there is place for Inhibition  
tacit relocation: to stop the effect of which, the titu- of teinds.

may still obtain and execute an inhibition of teinds against the tackfman; which differs much from inhibition of lands (explained under the next section), and is intended merely to interpel or inhibit the tackfman from farther intermeddling. This diligence of inhibition may also be used at the suit of the titular, against any other possessor of the teinds; and if the tackfman or possessor shall intermeddle after the inhibition is executed, he is liable in a spuilzie.

19. Lands and teinds pass by different titles: a disposition of lands therefore, though granted by one who has also right to the teind, will not carry the teind, unless it shall appear from special circumstances that a sale of both was designed by the parties. In lands *cum decimis inclusis*, where the teinds are consolidated with the stock, the right of both must necessarily go together in all cases.

## SECT. XI. Of Inhibitions.

clxxi.

THE constitution and transmission of feudal rights being explained, and the burdens with which they are chargeable, it remains to be considered, how these rights may be affected at the suit of creditors, by legal diligence. Diligences are certain forms of law, where- by a creditor endeavours to make good his payment, either by affecting the person of his debtor, or by securing the subjects belonging to him from alienation, or by carrying the property of these subjects to himself. They are either real or personal. Real diligence is that which is proper to heritable or real rights; personal, is that by which the person of the debtor may be secured, or his personal estate affected. Of the first sort we have two, *viz.* Inhibition and adjudication.

Diligences.

2. Inhibition is a personal prohibition, which passes by letters under the signet, prohibiting the party inhibited to contract any debt, or do any deed, by which any part of his lands may be aliened or carried off in prejudice of the creditor inhibiting. It must be executed against the debtor, personally, or at his dwelling-house, as summonses, and thereafter published and registered in the same manner with interdictions, (see No clxxxiii. 21.)

Inhibition.

3. Inhibition may proceed, either upon a liquid obligation, or even on an action commenced by a creditor for making good a claim not yet followed by the judge;

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which last is called *inhibition upon a depending action*. The summons, which constitutes the dependence, must be executed against the debtor before the letters of inhibition pass the signet; for no suit can be said to depend against one, till he be cited in it as a defender: but the effect of such inhibition is suspended, till decree be obtained in the action against the debtor; and in the same manner, inhibitions on conditional debts have no effect till the condition be purified. Inhibitions are not granted, without a trial of the cause, when they proceed on conditional debts. And though, in other cases, inhibitions now pass of course, the lords are in use to stay, or recal them, either on the debtor's shewing cause why the diligence should not proceed, or even *ex officio* where the ground of the diligence is doubtful.

Limited to  
heritage.

4. Though inhibitions, by their uniform style, disable the debtor from selling his moveable as well as his heritable estate, their effect has been long limited to heritage, from the interruption that such an embargo upon moveables must have given to commerce; so that debts contracted after inhibition may be the foundation of diligence against the debtor's person and moveable estate. An inhibition secures the inhibitor against the alienation, not only of lands that belonged to his debtor when he was inhibited, but of those that he shall afterwards acquire: but no inhibition can extend to such after-purchases as lie in a jurisdiction where the inhibition was not registered; for it could not have extended to these, though they had been made prior to the inhibition.

5. This diligence only strikes against the voluntary debts or deeds of the inhibited person: it does not restrain him from granting necessary deeds, *i. e.* such as he was obliged to grant anterior to the inhibition, since he might have been compelled to grant these before the inhibitor had acquired any right by his diligence. By this rule, a wadsetter or annualreuter might, after being inhibited, have effectually renounced his right to the reversion on payment, because law could have compelled him to it; but to secure inhibitors against the effect of such alienations, it is declared by act of sederunt of the court of session, Feb. 19. 1680, that, after intimation of the inhibition to the reversioner, no renunciation or grant of redemption shall be sustained, except upon declarator of redemption brought by him, to which the inhibitor must be made a party.

Is simply  
prohibitory.

6. An inhibition is a diligence simply prohibitory, so that the debt, on which it proceeds, continues personal after the diligence; and consequently, the inhibitor, in a question with anterior creditors whose debts are not struck at by the inhibition, is only preferable from the period at which his debt is made real by adjudication: and where debts are contracted on heritable security, though posterior to the inhibition, the inhibitor's debt, being personal, cannot be ranked with them; he only draws back from the creditors ranked the sums contained in his diligence. The heir of the person inhibited is not restrained from alienation, by the diligence used against his ancestor; for the prohibition is personal, affecting only the debtor against whom the diligence is used.

7. Inhibitions do not, of themselves, make void the posterior debts or deeds of the person inhibited; they only afford a title to the user of the diligence to set

them aside, if he finds them hurtful to him: and even where a debt is actually reduced *ex capite inhibitionis*, such reduction, being founded solely in the inhibitor's interest, is profitable to him alone, and cannot alter the natural preference of the other creditors.

Purging  
inhibition.

8. Inhibitions may be reduced upon legal nullities, arising either from the ground of debt, or the form of diligence. When payment is made by the debtor to the inhibitor, the inhibition is said to be *purged*. Any creditor, whose debt is struck at by the inhibition, may, upon making payment to the inhibitor, compel him to assign the debt and diligence in his favour, that he may make good his payment the more effectually against the common debtor.

## SECT. XII. Of Comprisings, Adjudications, and Judicial Sales.

clxxii.

HERITABLE rights may be carried from the debtor to the creditor, either by the diligence of apprising (now adjudication), or by a judicial sale carried on before the court of session. Apprising, or comprising, was the sentence of a sheriff, or of a messenger who was specially constituted sheriff for that purpose, by which the heritable rights belonging to the debtor were sold for payment of the debt due to the appriser; so that apprisings were, by their original constitution, proper sales of the debtor's lands to any purchaser who offered. If no purchaser could be found, the sheriff was to apprise or tax the value of the lands by an inquest, (whence came the name of *apprising*), and to make over to the creditor lands to the value of the debt.

Apprising

2. That creditors may have access to affect the estate of their deceased debtor, though the heir should stand off from entering, it is made lawful (by 1540, c. 106.) for any creditor to charge the heir of his debtor to enter to his ancestor, year and day being past after the ancestor's death, within 40 days after the charge; and if the heir fails, the creditor may proceed to apprise his debtor's lands, as if the heir had been entered. Custom has so explained this statute, that the creditor may charge the heir, immediately after the death of his ancestor, provided letters of apprising be not raised till after the expiry both of the year and of the 40 days next ensuing the year, within which the heir is charged to enter. But this statute relates only to such charges on which apprising is to be led against the ancestor's lands; for, in those which are to be barely the foundation of a common summons or process against the heir, action will be sustained if the year be elapsed from the ancestor's death before the execution of the summons, though the 40 days should not be also expired. Though the statute authorises such charges against majors only, practice has also extended it against minors, and the rule is extended to the case where the heir is the debtor. One must, in this matter, distinguish between a general and a special charge. A general charge serves only to fix the representation of the heir who is charged, so as to make the debt his which was formerly his ancestor's: but a special charge makes up for the want of a service (N<sup>o</sup> clxxx. 25.); and states the heir, *fidione juris*, in the right of the subjects to which he is charged to enter. Where, therefore, the heir is the debtor, a general charge for fixing the representation against him is unnecessary, since the only concern of the creditor is, that his debtor

make

make up titles to the ancestor's estate, which is done by a special charge: but where the deceased was the debtor, the creditor must first charge his heir to enter in general, that it may be known whether he is to represent the debtor; if he does not enter within 40 days, the debt may be fixed against him by a decree of constitution, on which he must be charged to enter heir in special, upon 40 days more; and these must be elapsed before the creditor can proceed to appraise.

3. Appraisings in course of time underwent many changes in their form and effect, till at length, by act 1672, c. 19. adjudications were substituted in their place, which directed to proceed against debtors by way of action before the court of session. By that statute, such part of the debtor's lands is to be adjudged as is equivalent to the principal sum and interest of the debt, with the composition due to the superior and expenses of infestment, and a fifth part more in respect the creditor is obliged to take land for his money. The debtor must deliver to the creditor a valid right of the lands to be adjudged, or transmits thereof, renounce the possession in his favour, and ratify the decree of adjudication: and law considers the rent of the lands as precisely commensurate to the interest of the debt; so that the adjudger lies under no obligation to account for the surplus rents. In this, which is called a *special adjudication*, the legal, or time within which the debtor may redeem, is declared to be five years; and the creditor attaining possession upon it can use no further execution against the debtor, unless the lands be evicted from him.

4. Where the debtor does not produce a sufficient right to the lands, or is not willing to renounce the possession, and ratify the decree, (which is the case that has most frequently happened), the statute makes it lawful for the creditor to adjudge all right belonging to the debtor in the same manner, and under the same reversion of ten years, as he could, by the former laws, have appraised it. In this last kind, which is called a *general adjudication*, the creditor must limit his claim to the principal sum, interest, and penalty, without demanding a fifth part more. But no general adjudication can be inflicted on, without libelling in the summons the other alternative of a special adjudication: for special adjudications are introduced by the statute in the place of appraisings; and it is only where the debtor refuses to comply with the terms thereof, that the creditor can lead a general adjudication.

5. Abbreviates are ordained to be made of all adjudications, which must be recorded within 60 days after the date of the decree. In every other respect, general adjudications have the same effects that appraisings had; adjudgers in possession are accountable for the surplus rents; a citation in adjudications renders the subject litigious; superiors are obliged to enter adjudgers; the legal of adjudications does not expire during the debtor's minority, &c. Only it may be observed, that though appraisings could not proceed before the term of payment, yet where the debtor is *vergens ad inopiam*, the court *ex nobili officio* admit adjudication for the debt before it be payable. But this sort being founded solely in equity, subsists merely as a security, and cannot carry the property to the creditor by any length of time.

6. There are two kinds of adjudication, which took

place at the same time with appraisings, and still obtain; viz. adjudications on a decree *cognitionis causæ*, otherwise called *contra hereditatem jacentem*; and adjudications in implement. Where the debtor's appraiser heir, who is charged to enter, formally renounces the succession, the creditor may obtain a decree *cognitionis causæ*; in which, though the heir renouncing is cited for the sake of form, no sentence condemnatory can be pronounced against him, in respect of his renunciation; the only effect of it is to subject the *hereditas jacentis* to the creditor's diligence.

7. Adjudications *contra hereditatem jacentem*, carry not only the lands themselves that belonged to the deceased, but the rents thereof fallen due since his death; for these, as an accessory to the estate belonging to the deceased, would have descended to the heir if he had entered, which rule is applied to all adjudications led on a special charge. This sort of adjudication is declared redeemable within seven years, by any co-adjudging creditor, either of the deceased debtor, or of the heir renouncing. The heir himself, who renounces, cannot be restored against his renunciation, nor consequently redeem, if he be not a minor. But even a major may redeem indirectly, by granting a simulate bond to a confident person; the adjudication upon which, when conveyed to himself, is a good title to redeem all other adjudications against the lands belonging to his ancestor.

8. Adjudications in implement are deduced against those who have granted deeds without procuratory of resignation or precept of seisin, and refuse to divest themselves; to the end that the subject conveyed may be effectually vested in the grantee. These adjudications may be also directed against the heir of the granter, upon a charge to enter. Here there is no place for a legal reversion; for, as the adjudication is led for completing the right of a special subject, it must carry that subject as irredeemably as if the right had been voluntarily completed.

9. All adjudications led within year and day of that one which has been made first effectual by seisin (where seisin is necessary), or exact diligence for obtaining seisin, are preferable *pari passu*. The year and day runs from the date of the adjudication, and not of the seisin or diligence for obtaining it. After the days of that period, they are preferable according to their dates. All the co-adjudgers within the year are preferable *pari passu*, as if one adjudication had been led for all their debts. This makes the seisin or diligence on the first adjudication a common right to the rest, who must therefore refund to the owner of that diligence his whole expence laid out in carrying on and completing it. And tho' that first adjudication should be redeemed, the diligence upon it still subsists as to the rest. This *pari passu* preference, however, does not destroy the legal preference of adjudications led on *debita fundi*, (see N<sup>o</sup> clxix. 15.); nor does it take place in adjudications in implement.

10. Before treating of judicial sales of bankrupts estates, the nature of sequestration may be shortly explained, which is a diligence that generally useth in actions of sale. Sequestration of lands is a judicial act of the court of session, whereby the management of an estate is put into the hands of a factor or steward named by the court, who gives security, and is to be account-

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Scotland.

able for the rents to all having interest. This diligence is competent, either where the right of the lands is doubtful, if it be applied for before either of the competitors has attained possession; or where the estate is heavily charged with the debts: but, as it is an unfavourable diligence, it is not admitted, unless that measure shall appear necessary for the security of creditors. Subjects, not brought before the court by the diligence of creditors, cannot fall under sequestration; for it is the competition of creditors which alone founds the jurisdiction of the court to take the disputed subject into their possession.

11. The court of session who decrees the sequestration has the nomination of the factor, in which they are directed by the recommendation of the creditors. A factor appointed by the session, though the proprietor had not been seised in the lands, has a power to remove tenants. Judicial factors must, within six months after extracting their factory, make up a rental of the estate, and a list of the arrears due by tenants, to be put into the hands of the clerk of the process, as a charge against themselves, and a note of such alterations in the rental as may afterwards happen; and must also deliver to the clerk annually a scheme of their accounts, charge and discharge, under heavy penalties. They are, by the nature of their office, bound to the same degree of diligence that a prudent man adhibits in his own affairs; they are accountable for the interest of the rents, which they either have, or by diligence might have recovered, from a year after their falling due. As it is much in the power of those factors to take advantage of the necessities of creditors, by purchasing their debts at an undervalue, all such purchases made either by the factor himself, or to his behoof, are declared equivalent to an acquittance or extinction of the debt. No factor can warrantably pay to any creditor, without an order of the court of session; for he is, by the tenor of his commission, directed to pay the rents to those who shall be found to have the best right to them. Judicial factors are intitled to a salary, which is generally stated at five *per cent.* of their intromissions: but it is seldom ascertained till their office expires, or till their accounting; that the court may modify a greater or smaller salary, or none, in proportion to the factor's integrity and diligence. Many cases occur, where the court of session, without sequestration, name a factor to preserve the rents from perishing; *e.g.* where an heir is deliberating whether to enter, where a minor is without tutors, where a succession opens to a person residing abroad; in all which cases, the factor is subjected to the rules laid down in act of sederunt, Feb. 13. 1730.

State of  
bankrupt  
estates.

12. The word *bankrupt* is sometimes applied to persons whose funds are not sufficient for their debts; and sometimes, not to the debtor, but to his estate. The court of session are empowered, at the suit of any real creditor, to try the value of a bankrupt's estate, and sell it for the payment of his debts.

13. No process of sale, at the suit of a creditor, can proceed without a proof of the debtor's bankruptcy, or at least that his lands are so charged with debts that no prudent persons will buy from him; and therefore the summons of sale must comprehend the debtor's whole estate. The debtor, or his apparent heir, and all the real creditors in possession, must be made par-

ties to the suit; but it is sufficient if the other creditors be called by an edictal citation. The summons of sale contains a conclusion of ranking or preference of the bankrupt's creditors. In this ranking, first and second terms are assigned to the whole creditors for exhibiting in court (or producing) their rights and diligences; and the decree of certification proceeding thereupon, against the writings not produced, has the same effect in favour of the creditors who have produced their rights, as if that decree had proceeded upon an action of reduction-improvement. See N<sup>o</sup> clxxxiii. 3. The ranking of these creditors must be concluded by an extracted decree, before the actual sale. The irredeemable property of the lands is adjudged by the court to the highest offerer at the sale. The creditors receiving payment must grant to the purchaser absolute warrantice, to the extent of the sum received by them; and the lands purchased are declared disburdened of all debts or deeds of the bankrupt, or his ancestors, either on payment of the price by the purchaser to the creditors according to their preference, or on consignation of it, in case of their refusal, in the hands of the magistrates of Edinburgh: the only remedy provided to such creditors as judge themselves hurt by the sale or division of the price, even though they should be minors, is an action for recovering their share of the price against the creditors who have received it.

14. The expence of these processes is deburred by the factor out of the rents in his hands; by which the whole burden of such expence falls upon the posterior creditors.

15. Apparent heirs are intitled to bring actions of sale of the estates belonging to their ancestors, whether bankrupt or not; the expence of which ought to fall upon the pursuer, if there is any excrescence of the price, after payment of the creditors.

16. As processes of ranking and sale are designed for the common interest of all the creditors, no diligence carried on or completed during their pendency ought to give any preference in the competition; *pendente lite, nihil innovandum.*

17. It is a rule in all real diligences, that where a creditor is preferable on several different subjects, he cannot use his preference arbitrarily, by favouring one creditor more than another; but must allocate his universal or catholic debt proportionally against all the subjects or parties whom it affects. If it is material to such creditor to draw his whole payment out of any one fund, he may apply his debt so as may best secure himself: but that inequality will be rectified as to the posterior creditors, who had likewise, by their rights and diligences, affected the subjects out of which he drew his payment, by obliging him to assign in their favour his right upon the separate subjects which he did not use in the ranking; by which they may recur against these separate subjects for the shares which the debt preferred might have drawn out of them. As the obligation to assign is founded merely in equity, the catholic creditor cannot be compelled to it, if his assigning shall weaken the preference of any separate debt vested in himself, affecting the special subject sought to be assigned. But if a creditor upon a special subject shall acquire from another a catholic right, or a catholic creditor shall purchase a debt affecting a special subject,

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ject,



ject, with a view of creating to the special debt a higher degree of preference than was naturally due to it, by an arbitrary application of the catholic debt, equity cannot protect him from assigning in favour of the creditor excluded by such application, especially if, prior to the purchase, the subject had become litigious by the process of ranking; for transmissions ought not to have creditors who are no parties to them, nor to give the purchaser any new right which was not formerly in himself or his cedent.

## II. MOVEABLE RIGHTS.

THE law of heritable rights being explained, Moveable Rights fall next to be considered; the doctrine of which depends chiefly on the nature of Obligations.

### SECT. XIII. Of Obligations and Contracts in general.

AN obligation is a legal tie, by which one is bound to pay or perform something to another. Every obligation on the person obliged, implies an opposite right in the creditor, so that what is a burden in regard to the one is right with respect to the other; and all rights founded on obligation are called *personal*. There is this essential difference between a real and a personal right, that a *jus in re*, whether of property, or of an inferior kind as servitude, entitles the person vested with it to possess the subject as his own; or if he is not in possession, to demand it from the possessors: whereas the creditor in a personal right has only *jus ad rem*, or a right to compel the debtor to fulfil his obligation; without any right in the subject itself, which the debtor is bound to transfer to him. One cannot oblige himself, but by a present act of the will. A bare resolution therefore, or purpose, to be obliged, is alterable at pleasure.

2. Obligations are either, (1.) Merely natural, where one person is bound to another by the law of nature, but cannot be compelled by any civil action to the performance. Thus, though deeds granted by a minor having curators, without their consent, are null, yet the minor is naturally obliged to perform such deeds; and parents are naturally obliged to provide their children in reasonable patrimonies. Natural obligations intitle the creditor to retain what he has got in virtue thereof, without being subjected to restore it. (2.) Obligations are merely civil, which may be sued upon by an action, but are elided by an exception in equity; this is the case of obligations granted through force or fear, &c. (3.) Proper or full obligations, are those which are supported both by equity and the civil sanction.

3. Obligations may be also divided into, (1.) Pure, to which neither day nor condition is adjoined. These may be exacted immediately. (2.) Obligations (*ex die*), which have a day adjoined to their performance. In these, *dies statim cedit, sed non venit*; a proper debt arises from the date of the obligation, because it is certain that the day will exist; but the execution is suspended till the lapse of that day. (3.) Conditional obligations; in which there is no proper debt (*dies non credit*) till the condition be purified, because it is possible the condition may never exist; and which therefore are said to create only the hope of a debt; but the granter, even of these, has no right to refile. An obli-

gation, to which a day is adjoined that possibly may never exist, implies a condition; *dies incertus pro conditione habetur*. Thus, in the case of a provision to a child, payable when he attains to the age of fourteen, if the child dies before that age, the provision falls.

4. Obligations, when considered with regard to their cause, were divided by the Romans, into those arising from contract, quasi contract, delict, and quasi delict; but there are certain obligations, even full and proper ones, which cannot be derived from any of these sources, and to which Lord Stair gives the name of *obediential*. Such as the obligation on parents to aliment or maintain their children; which arises singly from the relation of parent and child, and may be enforced by the civil magistrate. Under parents are comprehended the mother, grandfather, and grandmother, in their proper order. This obligation on parents extends to the providing of their issue in all the necessaries of life, and giving them suitable education. It ceases, when the children can earn a livelihood by their own industry; but the obligation on parents to maintain their indigent children, and reciprocally on children to maintain their indigent parents, is perpetual. This obligation is, on the father's death, transferred to the eldest son, the heir of the family; who, as representing the father, must aliment his younger brothers and sisters: the brothers are only intitled to alimony, till their age of twenty-one, after which they are presumed able to do for themselves; but the obligation to maintain the sisters continues till their marriage. In persons of lower rank, the obligation to aliment the sisters ceases after they are capable of subsisting by any service or employment.

5. All obligations, arising from the natural duty of restitution, fall under this class: thus, things given upon the view of a certain event, must be restored, if that event does not afterwards exist: thus also, things given *ob turpem causam*, where the turpitude is in the receiver and not in the giver, must be restored. And on the same principle, one upon whose ground a house is built or repaired by another, is obliged, without any covenant, to restore the expence laid out upon it, in so far as it has been profitable to him.

6. A contract is the voluntary agreement of two or more persons, whereby something is to be given or performed upon one part, for a valuable consideration, either present or future, on the other part. Consent, which is implied in agreement, is excluded, (1.) By error in the essentials of the contract; for, in such case, the party does not properly contract, but errs or is deceived; and this may be also applied to contracts which take their rise from fraud or imposition. (2.) Consent is excluded by such a degree of restraint upon any of the contracting parties, as extorts the agreement; for where violence or threatening are used against a person, his will has really no part in the contract.

7. Loan, or *mutuum*, is that contract which obliges Loan. a person, who has borrowed any fungible subject from another, to restore to him as much of the same kind, and of equal goodness. Whatever receives its estimation in number, weight, or measure, is a fungible; as corn, wine, current coin, &c. The only proper subjects of this contract are things which cannot be used without either their extinction or alienation: hence, the

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the property of the thing lent is necessarily transferred by delivery to the borrower, who consequently must run all the hazards, either of its deterioration or its perishing, according to the rule, *res perit suo domino*. Where the borrower neglects to restore at the time and place agreed on, the estimation of the thing lent must be made according to its price at that time and in that place; because it would have been worth so much to the lender, if the obligation had been duly performed. If there is no place nor time stipulated for, the value is to be stated according to the price that the commodity gave when and where it was demanded. In the loan of money, the value put on it by public authority, and not its intrinsic worth, is to be considered. This contract is obligatory only on one part; for the lender is subjected to no obligation: the only action therefore that it produces, is pointed against the borrower, that he may restore as much in quantity and quality as he borrowed, together with the damage the lender may have suffered through default of due performance.

Commodate

8. Commodate is a species of loan, gratuitous on the part of the lender, where the thing lent may be used, without either its perishing or its alienation. Hence, in this sort of loan, the property continues with the lender: the only right the borrower acquires in the subject is its use, after which he must restore the individual thing that he borrowed: consequently, if the subject perishes, it perishes to the lender, unless it has perished by the borrower's fault. What degree of fault or negligence makes either of the contracting parties liable to the other in damages, is comprehended under the following rules. Where the contract gives a mutual benefit to both parties, each contractor is bound to adhibit a middle sort of diligence, such as a man of ordinary prudence uses in his affairs. Where only one of the parties has benefit by the contract, that party must use exact diligence; and the other who has no advantage by it, is accountable only for dole, or for gross omissions which the law construes to be dole. Where one employs less care on the subject of any contract which implies an exuberant trust, than he is known to employ in his own affairs, it is considered as dole.

9. By these rules, the borrower in the contract of commodate must be exactly careful of the thing lent, and restore it at the time fixed by the contract, or after that use is made of it for which it was lent: if he puts it to any other use, or neglects to restore it at the time covenanted, and if the thing perishes thereafter, even by mere accident, he is bound to pay the value. On the other part, the lender is obliged to restore to the borrower such of the expences debursed by him on that subject as arose from any uncommon accident, but not those that naturally attend the use of it. Where a thing is lent gratuitously, without specifying any time of redelivery, it constitutes the contract of *precarium*, which is revocable at the lender's pleasure, and, being entered into from a personal regard to the borrower, ceases by his death.

Depositio-

tion.

10. Depositum is a contract, by which one who has the custody of a thing committed to him (the depositary) is obliged to restore it to the depositor. If a reward is bargained for by the depositary for his care, it resolves into the contract of location. As this contract is gratuitous, the depositary is only answerable for the consequences of gross neglect; but after the depo-

sit is redemanded, he is accountable even for casual misfortunes. He is intitled to a full indemnification for the losses he has sustained by the contract, and to the recovery of all sums expended by him on the subject.

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11. An obligation arises without formal paction, barely by a traveller's entering into an inn, ship, or stable, and there depositing his goods, or putting up his horses; whereby the innkeeper, shipmaster, or stable, is accountable, not only for his own facts and those of his servants, (which is an obligation implied in the very exercise of these employments), but of the other guests or passengers; and, indeed, in every case, unless where the goods have been lost *damno fatali*, or carried off by pirates or house-breakers. Not only the masters of ships, but their employers, are liable each of them for the share that he has in the ship; but by the present custom of trading nations, the goods brought into a ship must have been delivered to the master or mate, or entered into the ship-books. Carriers fall within the intendment of this law; and practice has extended it to vintners within borough. The extent of the damage sustained by the party may be proved by his own oath in *litern*.

12. Sequestration, whether voluntarily consented to by the parties, or authorised by the judge, is a kind of deposit; but as the office of sequestrator, to whose care the subject in dispute is committed, is not considered as gratuitous, he cannot throw it up at pleasure, as a common depositary may do; and he is liable in the middle degree of diligence. Confignation of money is also a deposit. It may be made, either where the debt is called in question by the debtor, as in suspensions; or where the creditor refuses to receive his money, as in wadsets, &c. The risk of the configned money lies on the configner, where he ought to have made payment, and not confignation; or has configned only a part; or has chosen for confignatory, a person neither named by the parties nor of good credit. The charger, or other creditor, runs the risk, if he has charged for sums not due, or has without good reason refused payment, by which refusal the confignation became necessary. It is the office of a confignatory, to keep the money in safe custody till it be called for: if therefore he puts it out at interest, he must run the hazard of the debtor's insolvency; but, for the same reason, though he should draw interest for it, he is liable in none to the configner.

Confignation.

13. Pledge, when opposed to wadset, is a contract, Pledge. by which a debtor puts into the hands of his creditor a special moveable subject in security of the debt, to be redelivered on payment. Where a security is established by law to the creditor, upon a subject which continues in the debtor's possession, it has the special name of an hypothec. Tradesmen and ship-carpenters have an hypothec on the house or ship repaired, for the materials and other charges of reparation; but not for the expence of building a new ship. Owners of ships have an hypothec on the cargo for the freight; heritors on the fruits of the ground, and landlords on the *investia et illata*, for their rents. Writers also, and agents, have a right of hypothec, or more properly of retention, in their constituent's writings, for their claim of pains and debursments. A creditor cannot, for his own payment, sell the subject impignorated, without applying

Hypothec

applying to the judge-ordinary for a warrant to put it up to public sale or roup; and to this application the debtor ought to be made a party.

#### SECT. XIV. Of Obligations by Word or Writ.

THE appellation of *verbal* may be applied to all obligations to the constitution of which writing is not essential, which includes both real and consensual contracts; but as these are explained under separate titles, obligations by *word*, in the sense of this rubric, must be restricted, either to promises, or to such verbal agreements as have no special name to distinguish them. Agreement implies the intervention of two different parties, who come under mutual obligations to one another. Where nothing is to be given or performed but on one part, it is properly called a *promise*; which, as it is gratuitous, does not require the acceptance of him to whom the promise is made. An offer, which must be distinguished from a promise, implies something to be done by the other party; and consequently is not binding on the offerer, till it be accepted, with its limitations or conditions, by him to whom the offer is made; after which, it becomes a proper agreement.

2. Writing must necessarily intervene in all obligations and bargains concerning heritable subjects, tho' they should be only temporary; as tacks, which, when they are verbal, last but for one year. In these, no verbal agreement is binding, though it should be referred to the oath of the party; for, till writing is adhibited, law gives both parties a right to refile, as from an unfinished bargain; which is called *locus penitentiae*. If, upon a verbal bargain of lands, part of the price shall be paid by him who was to purchase, the *interventus rei*, the actual payment of money, creates a valid obligation, and gives a beginning to the contract of sale; and, in general, where-ever matters are no longer entire, the right to refile seems to be excluded. An agreement, whereby a real right is passed from, or restricted, called *pactum liberatorium*, may be perfected verbally; for freedom is favourable, and the purpose of such agreement is rather to dissolve than to create an obligation. Writing is also essential to bargains made under condition that they shall be reduced into writing; for in such cases, it is *pars contractus*, that, till writing be adhibited, both parties shall have liberty to withdraw. In the same manner, verbal or nuncupative testaments are rejected by our law; but verbal legacies are sustained, where they do not exceed L. 100 Scots.

3. Anciently, when writing was little used, deeds were executed by the party appending his seal to them, in presence of witnesses. For preventing frauds that might happen by appending seals to false deeds, the subscription also of the granter was afterwards required, and, if he could not write, that of a notary. As it might be of dangerous consequence to give full force to the subscription of the parties by initials, which is more easily counterfeited; our practice, in order to sustain such subscription, seems to require a proof, not only that the granter used to subscribe in that way, but that *de facto* he had subscribed the deed in question; at least, such proof is required, if the instrumentary witnesses be still alive.

4. As a further check, it was afterwards provided that all writings carrying any heritable right, and o-

ther deeds of importance, be subscribed by the principal parties, if they can subscribe; otherwise, by two notaries, before four witnesses specially designed. The subsequent practice extended this requisite of the designation of the witnesses to the case where the parties themselves subscribed. Custom has construed obligations for sums exceeding L. 100 Scots, to be obligations of importance. In a divisible obligation, *ex. gr.* for a sum of money, though exceeding L. 100, the subscription of one notary is sufficient, if the creditor restricts his claim to L. 100: But in an obligation indivisible, *e. g.* for the performance of a fact, if it be not subscribed in terms of the statute, it is void. When notaries thus attest a deed, the attestation or docquet must specially express that the granter gave them a mandate to sign; nor is it sufficient that this be mentioned in the body of the writing.

5. In every deed, the name of him who writes it, with his dwelling-place, or other mark of distinction, must be inserted. The witnesses must both subscribe as witnesses, and their names and designations be inserted in the body of the deed: And all subscribing witnesses must know the granter, and either see him subscribe, or hear him acknowledge his subscription; otherwise they are declared punishable as accessory to forgery. Deeds, decrees, and other securities, consisting of more than one sheet, may be written by way of book, in place of the former custom of pasting together the several sheets, and signing the joinings on the margin; provided each page be signed by the granter, and marked by its number, and the testing clause express the number of pages.

6. Instruments of seisin are valid, if subscribed by one notary, before a reasonable number of witnesses; which is extended by practice to instruments of resignation. Two witnesses are deemed a reasonable number to every deed that can be executed by one notary. It is not necessary, that the witnesses to a notarial instrument, or execution, see the notary or messenger sign; for they are called as witnesses to the transaction which is attested, and not to the subscription of the person attesting.

7. A new requisite has been added to certain deeds since the union, for the benefit of the revenue: They must be executed on stamped paper, or parchment, paying a certain duty to the crown. Charters, instruments of resignation, seisms, and retours of lands held of a subject, are charged with 2 s. 3 d. of duty: Bonds, tacks, contracts, and other personal obligations, paid at first 6 d. to which further additions have since, at different times, been made, the duty at present amounting to 4 s. Bail-bonds, bills, testaments, discharges, or acquittances of rent or of interest, and judicial deeds, as notarial instruments, bonds of cautionry in suspensions, &c. are excepted.

8. The granter's name and designation are essential, Blank- not properly as solemnities, but because no writing can bouds. have effect without them. Bonds were, by our ancient practice, frequently executed without filling up the creditor's name; and they passed from hand to hand, like notes payable to the bearer: But as there was no method for the creditor of a person possessed of these to secure them for his payment, all writings taken blank in the creditor's name are declared null, as covers to fraud; with the exception of indorations of bills of exchange.

9. Certain



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deeds.

9. Certain privileged writings do not require the ordinary solemnities. 1. Holograph deeds (written by the grantor himself) are effectual without witnesses. The date of no holograph writing, except a bill of exchange, (see next paragraph,) can be proved by the grantor's own assertion, in prejudice either of his heir or his creditors, but must be supported by other adminicles. 2. Testaments if executed where men of skill and business cannot be had, are valid though they should not be quite formal: and let the subject of a testament be ever so valuable, one notary signing for the testator, before two witnesses, is in practice sufficient. Clergymen were frequently notaries before the reformation; and, though they were afterwards prohibited to act as notaries, the case of testaments is excepted; so that there are supported by the attestation of one minister, with two witnesses. 3. Discharges to tenants are sustained without witnesses, from their presumed rusticity, or ignorance in business. 4. Misive letters in *re mercatoria*, commissions, and fitted accounts in the course of trade, and bills of exchange, though they are not holographs, are, from the favour of commerce, sustained without the ordinary solemnities.

Bills of ex-  
change.

10. A bill of exchange is an obligation in the form of a mandate, whereby the drawer or mandant desires him to whom it is directed, to pay a certain sum, at the day and place therein mentioned, to a third party. Bills of exchange are drawn by a person in one country to his correspondent in another; and they have that name, because it is the exchange, or the value of money in one place compared with its value in another, that generally determines the precise extent of the sum contained in the draught. The creditor in the bill is sometimes called the possessor, or *porteur*. As parties to bills are of different countries, questions concerning them ought to be determined by the received custom of trading nations, unless where special statute interposes. For this reason, bills of exchange, though their form admits not of witnesses, yet prove their own dates, in questions either with the heir, or creditors of the debtor; but this doctrine is not extended to inland bills payable to the drawer himself.

Their solem-  
nities and obli-  
gations.

11. A bill is valid, without the designation, either of the drawer, or of the person to whom it is made payable: It is enough, that the drawer's subscription appears to be truly his; and one's being possessor of a bill marks him out to be the creditor, if he bears the name given in the bill to the creditor: Nay, though the person drawn on should not be designated, his acceptance presumes that it was he whom the drawer had in his eye. Bills drawn blank, in the creditor's name, fall under the statutory nullity; for though indorsements of bills are excepted from it, bills themselves are not. Not only the person drawn upon must sign his acceptance, but the drawer must sign his draught, before any obligation can be formed against the acceptor: Yet it is sufficient in practice, that the drawer signs before the bill be produced in judgment; though it should be after the death both of the creditor and acceptor. A creditor in a bill may transmit it to another by indorsement, though the bill should not bear *to his order*; by the same rule that other rights are transmissible by assignation, though they do not bear *to assignees*.

Obligations

12. The drawer, by signing his draught, becomes liable for the value to the creditor in the bill, in case

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the person drawn upon either does not accept, or after acceptance does not pay; for he is presumed to have received value from the creditor at giving him the draught, though it should not bear *for value received*: But, if the drawer was debtor to the creditor in the bill before the draught, the bill is presumed to be given towards payment of the debt, unless it expressly bears *for value*. The person drawn upon, if he refuse to accept, while he has the drawer's money in his hands, is liable to him in damages. As a bill presumes value from the creditor, indorsement presumes value from the indorsee; who therefore, if he cannot obtain payment from the acceptor, has recourse against the indorser, unless the bill be indorsed in these words, *without recourse*.

13. Payment of a bill, by the acceptor, acquits both the drawer and him at the hands of the creditor: but it intitles the acceptor, if he was not the drawer's debtor, to an action of recourse against him; and, if he was, to a ground of compensation. Where the bill does not bear value in the hands of the person drawn upon, it is presumed that he is not the drawer's debtor, and consequently he has recourse against the drawer, *ex mandato*.

14. Bills, when indorsed, are considered as so many bags of money delivered to the onerous indorsee; which therefore carry right to the contents, free of all burdens that do not appear on the bills themselves. Hence, a receipt or discharge, by the original creditor, if granted on a separate paper, does not exempt the acceptor from second payment to the indorsee; hence, also, no ground of compensation competent to the acceptor against the original creditor can be pleaded against the indorsee: but, if the debtor shall prove, by the oath of the indorsee, that he paid not the full value for the indorsement, the indorsee is justly considered as but a name; and therefore all exceptions, receivable against the original creditor, will be sustained against him.

15. Bills must be negotiated by the possessor, against the person drawn upon, within a precise time, in order to preserve recourse against the drawer. In bills payable so many days after sight, the creditor has a discretionary power of fixing the payment somewhat sooner or later, as his occasions shall require. Bills payable on a day certain, need not be presented for acceptance till the day of payment, because that day can neither be prolonged nor shortened by the time of acceptance. For the same reason, the acceptance of bills, payable on a precise day, need not be dated: but, where a bill is drawn payable so many days after sight, it must; because there the term of payment depends on the date of the acceptance.

16. Though bills are, in strict law, due the very day on which they are made payable, and may therefore be protested on the day thereafter; yet there are three days immediately following the day of payment, called *days of grace*, within any of which the creditor may protest the bill: but if he delay protesting till the day after the last day of grace, he loses his recourse. Where a bill is protested, either for non acceptance or non payment, the dishonour must be notified to the drawer or indorser, within three posts at farthest. This strictness of negotiation is confined to such bills as may be protested by the possessor upon the third day of grace: where, therefore, bills are indorsed after the days of grace are expired, the indorsee is left more at liberty, and

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and does not lose his recourse, tho' he should not take a formal protest for not payment, if, within a reasonable time, he shall give the indorser notice of the acceptor's refusing to pay. Not only does the possessor, who neglects strict negotiation, lose his recourse against the drawer, where the person drawn upon becomes afterwards bankrupt; but tho' he should continue solvent: for he may, in that case, recover payment from the debtor, and so is not to be indulged in an unnecessary process against the drawer, which he has tacitly renounced by his negligence. Recourse is preserved against the drawer, though the bill should not be duly negotiated, if the person drawn upon was not his debtor; for there the drawer can qualify no prejudice by the neglect of diligence, and, he ought not to have drawn on one who owed him nothing.

17. The privileges superadded to bills by statute are, that though, by their form, they can have no clause of registration, yet, if duly protested, they are registrable within six months after their date in case of not acceptance, or in six months after the term of payment in the case of not payment; which registration is made the foundation of summary diligence, either against the drawer or indorser in the case of not acceptance, or against the acceptor in the case of not payment. This is extended to inland bills, *i. e.* bills both drawn and made payable in Scotland. After acceptance, summary diligence lies against no other than the acceptor; the drawer and indorser must be pursued by an ordinary action. It is only the principal sum in the bill, and interest, that can be charged for summarily: the exchange, when it is not included in the draught, the re-exchange incurred by suffering the bill to be protested and returned, and the expence of diligence, must all be recovered by an ordinary action; because there are not liquid debts, and so must be previously constituted.

18. Bills, when drawn payable at any considerable distance of time after date, are denied the privileges of bills; for bills are intended for currency, and not to lie as a security in the creditor's hands. Bills are not valid which appear *ex facie* to be donations. No extrinsic stipulation ought to be contained in a bill which deviates from the proper nature of bills: hence, a bill to which a penalty is adjoined, or with a clause of interest from the date, is null. Inland precepts drawn, not for money the medium of trade, but for fungibles, are null, as wanting writer's name and witnesses. It is not an agreed point whether promissory notes, without writer and witnesses, unless holograph, are probative.

19. By 12th Geo. III. c. 72. the law of Scotland has undergone very material alterations as to bills and promissory notes. By that act, they are declared to have the same privileges, and to prescribe in six years after the term of payment. Bank-notes and post-bills are excepted from this prescription; nor does it run during the years of the creditor's minority. Inland bills and promissory notes must be protested within the days of grace, to secure recourse; and the dishonour notified within 14 days after the protest. Summary diligence may pass not only against the acceptor, but likewise against the drawer, and all the indorsers jointly and severally; and at the instance of any indorser, though the bill was not protested in his name, upon his producing a receipt or letter from the protesting indorsee. This act is in force only for seven

years after 15th May 1772, and to the end of the then next session of parliament: consequently is not yet become a permanent part of the law of Scotland.

20. As for the solemnities essential to deeds signed in a foreign country, when they come to receive execution in Scotland, it is a general rule, that no laws can be of authority beyond the dominions of the law-giver. Hence, in strictness, no deed, though perfected according to the law of the place where it is signed, can have effect in another country where different solemnities are required to a deed of that sort. But this rigour is so softened *ex comitate*, by the common consent of nations, that all personal obligations granted according to the law of that country where they are signed, are effectual every where; which obtains even in obligations to convey heritage. Conveyances themselves, of heritable subjects, must be perfected according to the law of the country where the heritage lies, and from which it cannot be removed.

21. A writing, while the grantor keeps it under his own power or his doer's, has no force; it becomes obligatory, only after it is delivered to the grantee himself, or found in the hands of a third person. As to which last, the following rules are observed. A deed found in the hands of one who is doer both for the grantor and grantee, is presumed to have been put in his hands as doer for the grantee. The presumption is also for delivery, if the deed appears in the hands of one who is a stranger to both. Where a deed is deposited in the hands of a third person, the terms of depositation may be proved by the oath of the depositary, unless where they are reduced into writing. A deed appearing in the custody of the grantee himself, is considered as his absolute right; in so much that the grantor is not allowed to prove that it was granted in trust, otherwise than by a written declaration signed by the trustee, or by his oath.

22. The following deeds are effectual without delivery, (1.) Writings containing a clause dispensing with the delivery: these are of the nature of revocable deeds, where the death of the grantor is equivalent to delivery, because after death there can be no revocation. (2.) Deeds in favour of children, even natural ones; for parents are the proper custodians or keepers of their children's writings. From a similar reason, post-nuptial settlements by the husband to the wife need no delivery. (3.) Rights which are not to take effect till the grantor's death, or even where he reserves an interest to himself during his life; for it is presumed he holds the custody of these, merely to secure to himself such reserved interest. (4.) Deeds that the grantor lay under an antecedent natural obligation to execute, *e. g.* rights granted to a cautioner for his relief. (5.) Mutual obligations, *e. g.* contracts; for every such deed, the moment it is executed, is a common evidence to all the parties contractors. Lastly, the publication of a writing by registration, is equivalent to delivery.

SECT. XV. Of Obligations and Contracts arising from consent, and of Accessory Obligations. clxxv.

CONTRACTS consensual, *i. e.* which might, by the Roman law, be perfected by sole consent, without the intervention either of things or of writing, are sale, permutation, location, society, and mandate. Where the subject of any of these contracts is heritable, writing

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ting is necessary.

2. Sale is a contract, by which one becomes obliged to give something to another, in consideration of a certain price in current money to be paid for it. Things constituting merely in hope, may be the subject of this contract, as the draught of a net. Commodities, where their importation or use is absolutely prohibited, cannot be the subject of sale; and even in run goods, no action lies against the vender for not delivery, if the buyer knew the goods were run.

3. Though this contract may be perfected before delivery of the subject, the property remains till then with the vender. See No cxi. 9. Yet till delivery, the hazard of its deterioration falls on the purchaser, because he has all the profits arising from it after the sale. On the other hand, the subject itself perishes to the vender; (1.) If it should perish through his fault, or after his undue delay to deliver it. (2.) If a subject is sold as a fungible, and not as an individual, or *corpore*, e. g. a quantity of farm-wheat, sold without distinguishing the parcel to be delivered from the rest of the farm. (3.) The *periculum* lies on the vender till delivery, if he be obliged by a special article in the contract to deliver the subject at a certain place.

Location.

4. Location is that contract, where an hire is stipulated for the use of things, or for the service of persons. He who lets his work or the use of his property to hire, is the locator or lessor; and the other, the conductor or lessee. In the location of things, the lessor is obliged to deliver the subject, fitted to the use it was let for; and the lessee must preserve it carefully, put it to no other use, and, after that is over, restore it. Where a workman or artificer lets his labour, and if the work is either not performed according to contract, or if it be insufficient, even from mere unskillfulness, he is liable to his employer in damages; for he ought not, as an artificer, to have undertaken a work to which he was not equal. A servant hired for a certain term, is intitled to his full wages, though from sickness or other accident he should be disabled for a part of his time; but, if he die before the term, his wages are only due for the time he actually served. If a master dies, or without good reason turns off, before the term, a servant who eats in his house, the servant is intitled to his full wages, and to his maintenance till that term: and, on the other part, a servant who without ground deserts his service, forfeits his wages and maintenance, and is liable to his master in damages.

Society.

5. Society or copartnership is a contract, whereby the several partners agree concerning the communication of loss and gain arising from the subject of the contract. It is formed by the reciprocal choice that the partners make of one another; and so is not constituted in the case of co-heirs, or of several legatees in the same subject. A copartnership may be so constituted, that one of the partners shall, either from his sole right of property in the subject, or from his superior skill, be entitled to a certain share of the profits, without being subjected to any part of the loss; but a society, where one partner is to bear a certain proportion of loss, without being entitled to any share of the profits, is justly reprobated. All the partners are intitled to shares of profit and loss proportioned to their several stocks, where it is not otherwise covenanted.

6. As partners are united, from a *delectus personæ*,

in a kind of brotherhood, no partner can, without a special power contained in the contract, transfer any part of his share to another. All the partners are bound *in solidum* by the obligation of any one of them, if he subscribe by the *firm* or social name of the company; unless it be a deed that fails not under the common course of administration. The company effects are the company property of the society subjected to its debts; so that no partner can claim a division thereof, even after the society is dissolved, till these are paid: and, consequently, no creditor of a partner can, by diligence, carry to himself the property of any part of the common stock, in prejudice of a company-creditor: but he may, by arrestment, secure his debtor's share in the company's hands, to be made forthcoming to him at the close of the copartnership, in so far as it is not exhausted by the company debts.

7. Society being founded in the mutual confidence among the *socii*, is dissolved, not only by the renunciation, but by the death of any one of them, if he be not otherwise specially covenanted. A partner who renounces upon unfair views, or at a critical time, when his withdrawing may be fatal to the society, loses his partners from all their engagements to him, while he is bound to them for all the profits he shall make by his withdrawing, and for the loss arising thereby to the company. Not only natural, but civil death, e. g. arising from a sentence inflicting capital punishment, makes one incapable to perform the duties of a partner, and consequently dissolves the society. In both cases, of death and renunciation, the remaining partners may continue the copartnership, either expressly, by entering into a new contract; or tacitly, by carrying on their trade as formerly. Public trading companies are now every day constituted, with rules very different from those which either obtained in the Roman law, or at this day obtain in private societies. The proprietors or partners in these, though they may transfer their shares, cannot renounce; nor does their death dissolve the company, but the share of the deceased descends to his representative.

8. A joint trade is not a copartnership, but a momentary contract, where two or more persons agree to contribute a sum, to be employed in a particular course of trade, the produce whereof is to be divided among the adventurers, according to their several shares, after the voyage is finished. If, in a joint trade, that partner who is intrusted with the money for purchasing the goods, should, in place of paying them in cash, buy them upon credit, the furnisher who followed his faith alone in the sale, has no recourse against the other adventurers; he can only recover from them what of the buyer's share is yet in their hands. Where any one of the adventurers in a joint trade becomes bankrupt, the others are preferable to his creditors, upon the common stock, as long as it continues undivided, for their relief of all the engagements entered into by them on account of the adventure.

9. Mandate is a contract, by which one employs another to manage any business for him; and by the Roman law, it must have been gratuitous. It may be constituted tacitly, by one's suffering another to act in a certain branch of his affairs, for a tract of time together, without challenge. The mandatory is at liberty not to accept of the mandate; and, as his powers

A joint  
trade.

Mandate

are



are solely founded in the mandant's commission, he must, if he undertakes it, strictly adhere to the directions given him : Nor is it a good defence, that the method he followed was more rational ; for in that his employer was the proper judge. Where no special rules are prescribed, the mandatory, if he acts prudently, is secure, whatever the success may be ; and he can sue for the recovery of all the expences reasonably deburred by him in the execution of his office.

10. Mandates may be general, containing a power of admittirg the mandant's whole affairs ; but no mandate implies a power of disposing gratuitously of the constituent's property, nor even of selling his heritage for an adequate price : but a general mandatory may sell such of the moveables as mult otherwise perish. No mandatory can, without special powers, transact doubtful claims belonging to his constituent, or refer them to arbiters.

11. Mandates expire, (1.) By the revocation of the employer, though only tacit, as if he should name another mandatory for the same business. (2.) By the renunciation of the mandatory ; even after he has executed part of his commission, if his office be gratuitous. (3.) By the death, either of the mandant or mandatory : But if matters are not entire, the mandate continues in force, notwithstanding such revocation, renunciation, or death. Procuratories of resignation, and precepts of seisin, are made out in the form of mandates ; but, because they are granted for the sole benefit of the mandant, all of them, excepting precepts of *clare constat*, are declared to continue after the death either of the grantor or grantee. Deeds which contain a clause or mandate for registration, are for the same reason made registrable after the death of either.

12. The favour of commerce has introduced a tacit mandate, by which masters of ships are empowered to contract in name of their executors or employers, for repairs, ship-provisions, and whatever else may be necessary for the ship or crew ; so as to oblige not themselves only, but their employers. Whoever has the actual charge of the ship is deemed the master, though he should have no commission from the executors, or should be substituted by the master in the direction of the ship without their knowledge. Executors are liable, whether the master has paid his own money to a merchant for necessities, or has borrowed money to purchase them. The furnisher or lender must prove that the ship needed repairs, provisions, &c. to such an extent ; but he is under no necessity to prove the application of the money or materials to the ship's use. If there are several executors, they are liable *singuli in solidum*. In the same manner the undertaker of any branch of trade, manufacture, or other land negotiation, is bound by the contracts of the infititors whom he sets over it, in so far as relates to the subject of the *prepositura*.

13. Contracts and obligations, in themselves imperfect, receive strength by the contractor or his heirs doing any act thereafter which imports an approbation of them, and consequently supplies the want of an original legal consent. This is called *homologation* ; and it takes place even in deeds intrinsically null, whether the nullity arises from the want of statutory solemnities, or from the incapacity of the grantor. It cannot be inferred, (1.) By the act of a person who was not in the

knowledge of the original deed ; for one cannot approve what he is ignorant of. (2.) Homologation has no place where the act or deed, which is pleaded as such, can be ascribed to any other cause ; for an intention to come under an obligation is not presumed.

14. Quasi-contracts are formed without explicit consent, by one of the parties doing something that by its nature either obliges him to the other party, or the other party to him. Under this class may be reckoned tutory, &c. the entry of an heir, *negotiorum gestio, indebiti solutio*, communion of goods between two or more common proprietors, and *mercium jactus levanda navis causa*. *Negotiorum gestio* forms those obligations which arise from the management of a person's affairs, in his absence, by another, without a mandate. As such manager acts without authority from the proprietor, he ought to be liable in exact diligence, unless he has from friendship interposed in affairs which admitted no delay ; and he is accountable for his intromissions with interest. On the other party, he is intitled to the recovery of his necessary deburrments on the subject, and to be relieved of the obligations in which he may have bound himself in consequence of the management.

15. *Indebiti solutio*, or the payment to one of what is not due to him, if made through any mistake, either of fact, or even of law, bounds him who made the payment in an action against the receiver for repayment (*condictio indebiti*.) This action does not lie, (1.) If the sum paid was due *ex equitate*, or by a natural obligation : for the obligation to restore is founded solely in equity. (2.) If he who made the payment knew that nothing was due ; for *qui consulto dat quod non debebat, presumitur donare*.

16. Where two or more persons become common proprietors of the same subject, either by legacy, gift, or purchase, without the view of co-partnership, an obligation is thereby created among the proprietors to communicate the profit and loss arising from the subject, while it remains common : And the subject may be divided at the suit of any having interest. This division, where the question is among the common proprietors, is according to the valuation of their respective properties : But, where the question is between the proprietors and those having servitudes upon the property, the superficies is only divided, without prejudice to the property. Commonities belonging to the king, or to royal boroughs, are not divisible. Lands lying runrig, and belonging to different proprietors, may be divided, with the exception of borough and incorporated acres ; the execution of which is committed to the judge-ordinary, or justices of the peace.

17. The throwing of goods overboard, for lightening a ship in a storm, creates an obligation, whereby the owners of the ship and goods saved are obliged to contribute for the relief of those whose goods were thrown overboard, that so all may bear a proportional loss of the goods ejected for the common safety. In this contribution, the ship's provisions suffer no estimation. A master who has cut his mast, or parted with his anchor, to save the ship, is intitled to this relief ; but if he has lost them by the storm, the loss falls only on the ship and freight. If the ejection does not save the ship, the goods preserved from shipwreck are not liable in contribution. Ejection may be lawfully made, if the master and a third part of the mariners

Quasi-contracts.

Right of dividing common property.

Lex Rhodia de jactu.

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judge that measure necessary, though the owner of the goods should oppose it : and the goods ejected are to be valued at the price that the goods of the same sort which are saved shall be afterwards sold for.

Accessory  
obligations.

18. There are certain obligations which cannot subsist by themselves, but are accessions to, or make a part of, other obligations. Of this sort are fidejussion, and the obligation to pay interest. Cautionry, or fidejussion, is that obligation by which one becomes engaged as security for another, that he shall either pay a sum, or perform a deed.

Cautionry.

19. A cautioner for a sum of money may be bound, either simply as cautioner for the principal debtor, or conjunctly and severally for and with the principal debtor. The first has, by our customs, the *beneficium ordinis*, or of discussion; by which the creditor is obliged to discuss the proper debtor, before he can insist for payment against the cautioner. Where one is bound as full debtor with and for the principal, or conjunctly and severally with him, the two obligants are bound equally in the same obligation, each in *solidum*; and consequently, the cautioner, though he is but an accessory, may be sued for the whole, without either discussing or even citing the principal debtor. Cautioners for performance of facts by another, or for the faithful discharge of an office, (e. g. for factors, tutors, &c.) cannot by the nature of their engagement be bound conjunctly and severally with the principal obligant, because the fact to which the principal is bound cannot possibly be performed by any other. In such engagements, therefore, the failure must be previously constituted against the proper debtor, before action can be brought against the cautioner for making up the loss of the party suffering.

20. The cautioner, who binds himself at the desire of the principal debtor, has an *actio mandati* or of relief against him, for recovering the principal and interest paid by himself to the creditor, and for necessary damages; which action lies *de jure*, though the creditor should not assign to him on payment. As relief against the debtor is implied in fidejussory obligations, the cautioner, where such relief is cut off, is no longer bound: hence, the defence of prescription frees the cautioner, as well as the principal debtor.

21. But, (1.) Where the cautionry is interposed to an obligation merely natural, the relief is restricted to the sums that have really turned to the debtor's profit. (2.) A cautioner who pays without citing the debtor, loses his relief, in so far as the debtor had a relevant defence against the debt, in whole or in part. Relief is not competent to the cautioner, till he either pays the debt, or is distressed for it; except, 1st, Where the debtor is expressly bound to deliver to the cautioner his obligation cancelled, against a day certain, and has failed: or, 2dly, Where the debtor is *vergens ad inopiam*; in which case the cautioner may, by proper diligence, secure the debtor's funds for his own relief, even before payment or distress.

22. A right of relief is competent *de jure* to the cautioner who pays against his co-cautioners, unless where the cautioner appears to have renounced it. In consequence of this implied relief, a creditor, if he shall grant a discharge to any one of the cautioners, must, in demanding the debt from the others, deduct that part as to which he has cut off their relief by that dis-

charge. Where a cautioner in a bond signs a bond of corroboration, as a principal obligant with the proper debtor, and with them a new cautioner, the cautioner in the new bond is intitled to a total relief against the first cautioner, at whose desire he is presumed to be bound.

23. Cautionry is also judicial, as in a suspension. It is sufficient to loose the cautioner, that when he became bound, the suspender had good reason to suspend, e. g. if the charger had at that period no title, or had not then performed his part, tho' these grounds of suspension should be afterwards taken off. In all maritime causes, where the parties are frequently foreigners, the defender must give caution *judicio sibi et judicatum solvi*: such cautioner gets free by the death of the defender before sentence; but he continues bound, tho' the cause should be carried from the admiral to the court of session. This sort of caution is only to be exacted in causes strictly maritime.

24. It happens frequently, that a creditor takes two or more obligants bound to him, all as principal debtors, without fidejussion. Where they are so bound, for the performance of facts that are in themselves indivisible, they are liable each for the whole, or *singuli in solidum*. But, if the obligation be for a sum of money, they are only liable *pro rata*; unless, (1.) Where they are in express words bound conjunctly and severally; or, (2.) In the case of bills or promissory notes. One of several obligants of this sort, who pays the whole debt, or fulfils the obligation, is intitled to a proportional relief against the rest; in such manner, that the loss must, in every case, fall equally upon all the solvent obligants.

25. Obligations for sums of money are frequently accompanied with an obligation for the annual or interest thereof. Interest (*usura*) is the profit due by the debtor of a sum of money to the creditor, for the use of it. The canon law considered the taking of interest as unlawful: the law of Moses allowed it to be exacted from strangers; and all the reformed nations of Europe have found it necessary, after the example of the Romans, to authorise it at certain rates fixed by statute. Soon after the reformation, our legal interest was fixed at the rate of ten per cent. per annum; from which time, it has been gradually reduced, till at last, by 12 *Ann. stat. 2. c. 16*, it was brought to five per cent. and has continued at that rate ever since.

26. Interest is due, either by law, or by passion. It is due by law, either from the force of statute, under which may be included acts of sederunt, or from the nature of the transaction. Bills of exchange, and inland bills, though they should not be protested, carry interest from their date in case of not acceptance; or from the day of their falling due, in case of acceptance and not payment. Where a bill is accepted, which bears no term of payment, or which is payable on demand, no interest is due till demand be made of the sum, the legal voucher of which is a notarial protest. Interest is due by a debtor after denunciation, for all the sums contained in the diligence, even for that part which is made up of interest. Sums paid by cautioners on distress, carry interest, not only as to the principal sum in the obligation, but as to the interest paid by the cautioner. Factors named by the court of session

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cautionry.

Interest of  
money.

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are liable for interest, by a special act of sederunt; see No clxxii. 11.

27. It arises *ex lege*, or from the nature of the transaction, that a purchaser in a sale is liable in interest for the price of the lands bought from the term of his entry, though the price should be arrested in his hands, or though the seller should not be able to deliver to him a sufficient progress or title to the lands; for no purchaser can in equity enjoy the fruits of the lands, while at the same time he retains the interest of the price: but lawful confiscation of the price made by a purchaser, upon the refusal of the persons having right to receive it, stops the currency of interest. Where one intermeddles with money belonging to another which carries interest, he ought to restore it *cum omni abventionē et causā*; and is therefore liable in the interest of it, as being truly an accessory of the subject itself. It is also from the nature of the transaction, that interest is in certain cases allowed to merchants or others in name of damages.

28. Interest is due by express paction, where there is a clause in a bond or obligation, by which money is made to carry interest. An obligation is not lawful, where it is agreed on, that the yearly interest of the sum lent, if it should not be paid punctually as it falls due, shall be accumulated into a principal sum bearing interest; but an obligation may be lawfully granted, not only for the sum truly lent, but for the interest to the day at which the obligation is made payable, whereby the intermediate interest is accumulated into a principal sum from the term of payment. Interest may be also due by implied paction: Thus, where interest upon a debt is by a letter promised for time past, such promise implies a paction for interest as long as the debt remains unpaid; thus also, the use of payment of interest presumes a paction, and when interest is expressed for one term, it is presumed to be bargained for till payment.

General principles of obligations.

29. The subject-matter of all obligations consists either of things, or of facts. Things exempted from commerce cannot be the subject of obligation. See No clxxii. 2. One cannot be obliged to the performance of a fact naturally impossible; nor of a fact in itself immoral, for that is also in the judgment of law impossible. Since impossible obligations are null, no penalty or damage can be incurred for non-performance: but it is otherwise, if the fact be in itself possible, though not in the debtor's power; in which case the rule obtains, *locum facti impræstabilis subit damnum et interesse*.

30. An obligation, to which a condition is adjoined, either naturally or morally impossible, is in the general case null; for the parties are presumed not to have been serious. But such obligation is valid, and the condition thereof held *pro non scripta*, (1.) In testaments; (2.) In obligations, to the performance of which the granter lies under a natural tie, as in bonds of provision to a child. Where an obligation is granted under a condition, lawful but unfavourable, e. g. that the creditor shall not marry without the consent of certain friends, no more weight is given to the condition than the judge thinks reasonable. A condition, which is in some degree in the power of the creditor himself, is held as fulfilled, if he has done all he could to fulfil it. Implement or performance cannot be de-

manded in a mutual contract, by that party who himself declines or cannot fulfil the counterpart.

31. Donation, so long as the subject is not delivered to the donee, may be justly ranked among obligations; and it is that obligation which arises from the mere good-will and liberality of the granter. Donations imply no warrandice, but from the future facts of the donor. They are hardly revokable by our law for ingratitude, though it should be of the grossest kind: those betwixt man and wife are revokable by the donor, even after the death of the donee; but remuneratory grants, not being truly donations, cannot be so revoked. That special sort of donation, which is constituted verbally, is called a *promissio*. The Roman law intitled all donors to the *beneficium competentiæ*, in virtue of which they might retain such part of the donation as was necessary for their own subsistence. Our law allows this benefit to fathers, with respect to the provisions granted to their children; and to grandfathers, which is a natural consequence of children's obligation to aliment their indigent parents; but to no collateral relation, not even to brothers.

Donation.

32. Donations, made in contemplation of death, or *mortis causa*, are of the nature of legacies, and like them revokable: consequently, not being effectual in the granter's life, they cannot compete with any of his creditors; not even with those whose debts were contracted after the donation. They are understood to be given from a personal regard to the donee, and therefore fall by his predecease. No deed, after delivery, is to be presumed a *donatio mortis causa*; for revocation is excluded by delivery.

33. Deeds are not presumed, *in dubio*, to be donations. Hence, a deed by a debtor to his creditor, if donation be not expressed, is presumed to be granted in security or satisfaction of the debt; but bonds of provision to children are, from the presumption of paternal affection, construed to be intended as an additional patrimony: yet a tocher, given to a daughter in her marriage-contract, is presumed to be in satisfaction of all former bonds and debts; because marriage-contracts usually contain the whole provisions in favour of the bride. One who alimts a person that is come of age, without an express paction for board, is presumed to have entertained him as a friend, unless in the case of those who earn their living by the entertainment or board of strangers. But alimony given to minors, who cannot bargain for themselves is not accounted a donation; except either where it is presumed, from the near relation of the person alimnting, that it was given *ex pietate*; or where the minor had a father or curators, with whom a bargain might have been made.

SECT. XVI. Of the Dissolution or Extinction of Obligations.

clxxvi.

OBLIGATIONS may be dissolved by performance or implement, consent, compensation, novation, and confusion. (1.) By specific performance: thus, an obligation for a sum of money is extinguished by payment. The creditor is not obliged to accept of payment by parts, unless where the sum is payable by different divisions. If a debtor in two or more separate bonds to the same creditor, made an indefinite payment, without ascribing it, at the time, to any one of the

Extinction of obligations; as performance.



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the obligations, the payment is applied, 1st, To interest, or to sums not bearing interest. 2dly, To the sums that are least secured, if the debtor thereby incurs no rigorous penalty. But, 3dly, If this application be penal on the debtor, *c. p.* by suffering the legal of an adjudication to expire, the payment will be so applied to as to save the debtor from that forfeiture. Where one of the debts is secured by a cautioner, the other not, the application is to be so made, *ceteris paribus*, that both creditor and cautioner may have equal justice done to them.

2. Payment made by the debtor upon a mistake in fact, to one whom he believed, upon probable grounds, to have the right of receiving payment; extinguishes the obligation. But payment made to one, to whom the law denies the power of receiving it, has not this effect; as if a debtor, seized by letters of caption, should make payment to the messenger; for *ignorantia juris neminem excusat*. In all debts, the debtor, if he be not interpellated, may safely pay before the term, except in tack-duties or feu-duties; the payment whereof, before the terms at which they are made payable, is construed to be collusive, in a question with a creditor of the landlord or superior. Payment is *in dubio* presumed, by the voucher of the debt being in the hands of the debtor; *chirographum, apud debitorem repertum, præsumitur solutum*.

By consent.

3. Obligations are extinguishable by the consent of the creditor, who, without full implement, or even any implement, may renounce the right constituted in his own favour. Though a discharge or acquittance, granted by one whom the debtor *bona fide* took for the creditor, but who was not, extinguishes the obligation, if the satisfaction made by the debtor was real; yet where it is imaginary, the discharge will not free him from paying to the true creditor the debt that he had made no prior satisfaction for. In all debts which are constituted by writing, the extinction, whether it be by specific performance, or bare consent, must be proved, either by the oath of the creditor, or by a discharge in writing; and the same solemnities which law requires in the obligation, are necessary in the discharge; but, where payment is made, not by the debtor himself, but by the creditor's intromission with the rents of the debtor's estate, or by delivery to him of goods in name of the debtor, such delivery or intromission, being *facti*, may be proved by witnesses, though the debt should have been not only constituted by writing, but made real on the debtor's lands by adjudication.

4. A discharge, though it should be general, of all that the granter can demand, extends not to debts of an uncommon kind, which are not presumed to have been under the granter's eye. This doctrine applies also to general assignments. In annual payments, as of rents, feu-duties, interest, &c. three consecutive discharges by the creditor, of the yearly or termly duties, presume the payment of all precedings. Two discharges by the ancestor, and the third by the heir, do not infer this presumption, if the heir was ignorant of the ancestor's discharges. And discharges by an administrator, as a factor, tutor, &c. presume only the payment of all preceding duties incurred during his administration. This presumption arises from repeating the discharges thrice successively; and so does not hold in the case of two discharges, though they should include

the duties of three or more terms.

5. Where the same person is both creditor and debtor to another, the mutual obligations, if they are for equal sums, are extinguished by compensation; if for unequal, still the lesser obligation is extinguished, and the greater diminished, as far as the concurrence of debt and credit goes. To found compensation, (1.) Each of the parties must be debtor and creditor at the same time. (2.) Each of them must be debtor and creditor in his own right. (3.) The mutual debts must be of the same quality: hence, a sum of money cannot be compensated with a quantity of corns; because, till the prices are fixed, at which the corns are to be converted into money, the two debts are incommensurable. Lastly, compensation cannot be admitted, where the mutual debts are not clearly ascertained, either by a written obligation, the sentence of a judge, or the oath of the party. Where this requires but a short discussion, sentence for the pursuer is delayed for some time, *ex equitate*, that the defender may make good his ground of compensation. Where a debt for fungibles is ascertained in money, by the sentence of a judge, the compensation can have no effect farther back than the liquidation; because, before sentence, the debts were incommensurable: but, where a debt for a sum of money is, in the course of a suit, constituted by the oath of the debtor, the compensation, after it is admitted by the judge, operates, *retro*, in so far as concerns the currency of interest, to the time that, by the parties acknowledgment, the debt became due: for, in this case, the debtor's oath is not what creates the debt, or makes it liquid; it only declares that such a liquid sum was truly due before. Compensation cannot be offered after decree, either by way of suspension or reduction; unless it has been formerly pleaded, and unjustly repelled. Decrees in absence are excepted.

6. The right of retention, which bears a near resemblance to compensation, is chiefly competent, where the mutual debts, not being liquid, cannot be the ground of compensation; and it is sometimes admitted *ex equitate*, in liquid debts, where compensation is excluded by statute: thus, though compensation cannot be pleaded after decree, either against a creditor or his assignee; yet, if the original creditor should become bankrupt, the debtor, even after decree, may retain against the assignee, till he gives security for satisfying the debtor's claim against the cedent. This right is frequently founded in the expence debursed or work employed on the subject retained, and so arises from the mutual obligations incumbent on the parties. But retention may be sustained, though the debt due to him who claims it does not arise from the nature of the obligation by which he is debtor: thus, a factor on a land-estate may retain the sums levied by him in consequence of his factory, not only till he be paid of the disbursements made on occasion of such estate, but also till he be discharged from the separate engagements he may have entered into on his constituent's account.

7. Obligations are dissolved by novation, whereby one obligation is changed into another, without changing either the debtor or creditor. The first obligation being thereby extinguished, the cautioners in it are loosed, and all its consequences discharged; so that the debtor remains bound only by the last. As a creditor to whom a right is once constituted, ought not to lose it

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By compen-  
sation.

By reten-  
tion.

By novation.

it by implication, novation is not easily presumed, and the new obligation is construed to be merely corroborative of the old; but, where the second obligation expressly bears to be in *satisfaction* of the first, these words must necessarily be explained into novation. Where the creditor accepts of a new debtor, in place of the former who is discharged, this method of extinction is called *delegation*.

8. Obligations are extinguished *confusione*, where the debt and credit meet in the same person, either by succession or singular title, *e. g.* when the debtor succeeds to the creditor, or the creditor to the debtor, or a stranger to both; for one cannot be debtor to himself. If the succession, from which the *confusio* arises, happens afterwards to be divided, so as the debtor and creditor come again to be different persons; the *confusio* does not produce an extinction, but only a temporary suspension, of the debt.

### SECT. XVII. Of Assignations.

HERITABLE rights, when they are clothed with investiture, are transmitted by disposition, which is a writing containing procuratory of resignation and precept of feisin; but those which either require no feisin, or on which feisin has not actually followed, are transmissible by simple assignation. He who grants the assignation, is called the cedent; and he who receives it, the assignee or assignee: if the assignee conveys his right to a third person, it is called a transmutation; and if he assigns it back to the cedent, a retrocession. Certain rights are, from the uses to which they are destined, incapable of transmission, as alimentary rights: others cannot be assigned by the person invested in them, without special powers given to him; as tacks, reversions: the transmission of a third sort, is not presumed to be intended, without an express conveyance; as of paraphernal goods, which are so proper to the wife, that a general assignation, by her to her husband, of all that did or should belong to her at her decease, does not comprehend them. A life-rent-right is, by its nature, incapable of a proper transmission; but its profits may be assigned, while it subsists.

2. Assignations must not only be delivered to the assignee, but intimated by him to the debtor. Intimations are considered as so necessary for completing the conveyance, that in a competition between two assignations, the last, if first intimated, is preferred.

3. Though, regularly, intimation to the debtor is made by an instrument, taken in the hands of a notary, by the assignee or his procurator; yet the law admits equipollencies, where the notice of the assignment given to the debtor is equally strong. Thus, a charge upon letters of horning at the assignee's instance, or a suit brought by him against the debtor, supplies the want of intimation; these being judicial acts, which expose the conveyance to the eyes both of the judge and of the debtor; or the debtor's promise of payment by writing to the assignee, because that is in effect a corroborating of the original debt. The assignee's possession of the right, by entering into payment of the rents or interest, is also equal to an intimation; for it imports, not only notice to the debtor, but his actual compliance: but the debtor's private knowledge of the assignment is not sustained as intimation.

4. Certain conveyances need no intimation. (1.) In-

dorsements of bills of exchange; for these are not to be fettered with forms, introduced by the laws of particular states. (2.) Bank-notes are fully conveyed by the bare delivery of them; for as they are payable to the bearer, their property must pass with their possession.

(3.) Adjudication, which is a judicial conveyance; and marriage, which is a legal one; carry the full right of the subjects thereby conveyed, without intimation: nevertheless, as there is nothing in these conveyances which can of themselves put the debtor in *mala fide*, he is therefore in *tuto* to pay to the wife, or to the original creditor in the debt adjudged, till the marriage or adjudication be notified to him. Assignments of moveable subjects, though they be intimated, if they are made *retenta possessione*, (the cedent retaining the possession), cannot hurt the cedent's creditors; for such rights are presumed, in all questions with creditors, to be collusive, and granted in trust for the cedent himself.

5. An assignation carries to the assignee the whole right of the subject conveyed, as it was in the cedent; and consequently, he may use diligence, either in his cedent's name while he is alive, or in his own.

6. After an assignation is intimated, the debtor cannot prove a payment, or compensation, by the oath of the cedent, who has no longer any interest in the debt; unless the matter has been made litigious by an action commenced prior to the intimation: but the debtor may refer to the oath of the assignee, who is in the right of the debt, that the assignment was gratuitous, or in trust for the cedent; either of which being proved, the oath of the cedent will affect the assignee. If the assignment be in part onerous, and in part gratuitous, the cedent's oath is good against the assignee, only in so far as his right is gratuitous. All defences competent against the original creditor in a moveable debt, which can be proved otherwise than by his oath, continue relevant against even an onerous assignee; whose right can be no better than that of his author, and must therefore remain affected with all the burdens which attended it in the author's person.

### SECT. XVIII. Of Arrestments and Poindings.

THE diligences, whereby a creditor may affect his debtor's moveable subjects, are arrestment and pouncing. By arrestment is sometimes meant the securing of a criminal's person till trial; but as it is understood in the rubric of this title, it is the order of a judge, by which he who is debtor in a moveable obligation to the arrester's debtor, is prohibited to make payment or delivery till the debt due to the arrester be paid or secured. The arrester's debtor is usually called the common debtor; because, where there are two or more competing creditors, he is debtor to all of them. The person in whose hands the diligence is used, is styled the arrestee.

2. Arrestment may be laid on by the authority either of the supreme court, or of an inferior judge. In the first case, it proceeds either upon special letters of arrestment, or on a warrant contained in letters of horning; and it must be executed by a messenger. The warrants granted by inferior judges are called precepts of arrestment, and they are executed by the officer proper to the court. Where the debtor to the common debtor is a pupil, arrestment is properly used in the hands

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hands of the tutor, as the pupil's administrator: this doctrine may perhaps extend to other general administrators, as commissioner, &c. But arrestment, used in the hands of a factor or steward, cannot found an action of forthcoming without calling the constituent. Where the debtor to the common debtor is a corporation, arrestment must be used in the hands of the directors or treasurer, who represent the whole body. Arrestment, when it is used in the hands of the debtor himself, is inept; for that diligence is intended only as a restraint upon third parties.

3. All debts, in which one is personally bound, though they should be heritably secured, are grounds upon which the creditor may arrest the moveable estate belonging to his debtor. Arrestment may proceed on a debt, the term of payment whereof is not yet come, in case the debtor be *vergens ad inopiam*. If a debt be not yet constituted by decree or registration, the creditor may raise and execute a summons against his debtor for payment, on which pending action arrestment may be used, in the same manner as inhibition, which is called *arrestment upon a dependence*. If one's ground of credit be for the performance of a fact, or if his depending process be merely declaratory, without a conclusion of payment or delivery, such claims are not admitted to be sufficient grounds for arrestment.

What debts  
arrestable.

4. Moveable debts are the proper subject of arrestment; under which are comprehended conditional debts, and even depending claims. For lessening the expence of diligence to creditors, all bonds which have not been made properly heritable by seisin are declared arrestable: but this does not extend to adjudications, wadsets, or other personal rights of lands, which are not properly debts. Certain moveable debts are not arrestable. (1.) Debts due by bill, which pass from hand to hand as bags of money. (2.) Future debts; for though inhibition extends to *adquirenda* as well as *adquisita*, yet arrestment is limited, by its warrant, to the debt due at the time of serving it against the arrestee. Hence, an arrestment of rents or interest carries only those that have already either fallen due, or at least become current. Claims, depending on the issue of a suit, are not considered as future debts; for the sentence, when pronounced, has a retrospect to the period at which the claim was first founded. The like doctrine holds in conditional debts. (3.) Alimentary debts are not arrestable; for these are granted on personal considerations, and so are not communicable to creditors: but the past interest due upon such debt may be arrested by the person who has furnished the alimony. One cannot secure his own effects to himself for his maintenance, so as they shall not be affectable by his creditors. Salaries annexed to offices granted by the king, and particularly those granted to the judges of the Session, and the fees of servants, are considered as alimentary funds; but the surplus fee, over and above what is necessary for the servant's personal uses, may be arrested.

Effect of  
breach of  
arrestment.

5. If, in contempt of the arrestment, the arrestee shall make payment of the sum, or deliver the goods arrested, to the common debtor, he is not only liable criminally for breach of arrestment, but he must pay the debt again to the arrester. Arrestment is not merely prohibitory, as inhibitions are; but is a step of diligence which founds the user in a subsequent ac-

tion, whereby the property of the subject arrested may be adjudged to him. It therefore does not, by our latter practice, fall by the death of the arrestee; but continues to subsist, as a foundation for an action of forthcoming against his heir, while the subject arrested remains *in medio*. Far less is arrestment lost, either by the death of the arrester, or of the common debtor.

Looking only  
arrestment.

6. Where arrestment proceeds on a depending action, it may be looked by the common debtor's giving security to the arrester for his debt in the event it shall be found due. Arrestment founded on decrees, or on registered obligations, in which the debts or mutual obligations are not liquid, (3.) Where the decree is suspended, or turned into a libel; for, till the suspension be discussed, or the pending action concluded, it cannot be known whether any debt be truly due. A looking takes off the *nexus* which had been laid on the subject arrested; so that the arrestee may thereafter pay safely to his creditor, and the cautioner is substituted in place of the arrestment, for the arrester's security: yet the arrester may, while the subject continues with the arrestee, pursue him in a forthcoming, notwithstanding the looking.

Forthcoming  
ing on ar-  
restment.

7. Arrestment is only an inchoate or begun diligence; to perfect it, there must be an action brought by the arrester against the arrestee, to make the debt or subject arrested forthcoming. In this action, the common debtor must be called for his interest, that he may have an opportunity of excepting to the lawfulness or extent of the debt on which the diligence proceeded. Before a forthcoming can be pursued, the debt due by the common debtor to the arrester must be liquidated; for the arrester can be no further intitled to the subject arrested than to the extent of the debt due to him by the common debtor. Where the subject arrested is a sum of money, it is, by the decree of forthcoming, directed to be paid to the pursuer towards satisfying his debt; where goods are arrested, the judge ordains them to be exposed to sale, and the price to be delivered to the pursuer. So that, in either case, decrees of forthcoming are judicial assignations to the arrester of the subject arrested.

8. In all competitions, regard is had to the dates, Preference not of the grounds of debt, but of the diligences proceeding upon them. In the competition of arrestments, the preference is governed by their dates, according to the priority even of hours, where it appears with any certainty which is the first. But, as arrestment is but a begun diligence, therefore if a prior arrester shall neglect to intill in an action of forthcoming for such a time as may be reasonably construed into a desertion of his begun diligence, he loses his preference. But, as dereliction of diligence is not easily presumed, the distance of above two years, between the first arrestment and the decree of forthcoming, was found not to make such a *mora* as to intitle the posterior arrester to a preference. This rule of preference, according to the dates of the several arrestments, holds, by our present practice, whether they have proceeded on a decree, or on

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Powers of messengers in poiding.

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on a dependence; on debts not yet payable, or on debts already payable; provided the pendency shall have been clofed, or the debt have become payable, before the issue of the competition.

9. In the competition of arreftments with assignations, an assignation by the common debtor, intimated before arreftment, is preferable to the arreftment. If the assignation is granted before arreftment, but not intimated till after it, the arrefter is preferred.

10. Poiding is that diligence affecting moveable subjects, by which their property is carried directly to the creditor. No poiding can proceed, till a charge be given to the debtor to pay or perform, and the days thereof be expired, except poidings againft vassals for their feu-duties, and poidings againft tenants for rent, proceeding upon the landlord's own decree; in which the ancient custom of poiding without a previous charge continues. A debtor's goods may be poided by one creditor, though they have been arrefted before by another; for arreftment being but an imperfect diligence, leaves the right of the subject still in the debtor, and fo cannot hinder any creditor from using a more perfect diligence, which has the effect of carrying the property directly to himself.

11. No cattle pertaining to the plough, nor instruments of tillage, can be poided in the time of labouring or tilling the ground, unless where the debtor has no other goods. By labouring-time is understood, that time, in which that tenant, whose goods are to be poided, is ploughing, though he should have been earlier or later than his neighbours; but summer fallowing does not fall under this rule.

12. In the execution of poiding, the debtor's goods must be apprifed, first on the ground of the lands where they are laid hold on, and a second time at the market-crofs of the jurisdiction, by the stated apprifers thereof; or, if there be none, by persons named by the messenger or other officer employed in the diligence. Next, the messenger must, after public intimation by three oyesles, declare the value of the goods according to the second apprifement, and require the debtor to make payment of the debt, including interest and expences. If payment shall be offered to the creditor, or in his absence to his lawful attorney; or if, in case of refusal by them, confiscation of the debt shall be made in the hands of the judge-ordinary or his clerk, the goods must be left with the debtor; if not, the messenger ought to adjudge and deliver them over, at the apprifed value, to the user of the diligence towards his payment: and the debtor is intitled to a copy of the warrant and executions, as a voucher that the debt is discharged in whole or in part by the goods poided.

13. Ministers may poid for their stipends, upon one apprifement on the ground of the lands; and landlords were always in use to poid fo, for their rents. Apprifement of the goods at the market-crofs of the next royal borough, or even of the next head-borough of stewartry or regality, though these jurisdictions be abolished, is declared as sufficient as if they were carried to the head-borough of the shire. Poiding, whether it be considered as a sentence, or as the execution of a sentence, must be proceeded in between sun-rising and sun-setting; or at least it must be finished before

the going off of day-light. The powers of the officer employed in the execution of poidings, are not clearly defined by custom, in the case of a third party claiming the property of the goods to be poided. This is certain, that he may take the oath of the claimant, upon the verity of his claim; and if from thence it shall appear that the claimant's title is collusive, he ought to proceed in the diligence; but, if there remains the least doubt, his safest course is to deliver the goods to the claimant, and to express in his execution the reasons why poiding did not proceed.

14. Any person who stops a poiding *via falsi*, on groundless pretences, is liable, both criminally, in the pains of deforcement, (see No cxxxvi. 15.) and civilly, in the value of the goods which might have been poided by the creditor.

15. By 12<sup>th</sup> Geo. III. c. 72. the creditor upon whose diligence a debtor is rendered bankrupt, or the debtor himself, if he finds his circumstances failing, may apply to the court of session for a sequestration of his personal estate for behoof of all his creditors; and have it vested either in a factor named by the court, or in a factor or trustees named by the creditors. All arreftments or poidings of the debtor's effects executed within 30 days prior to the sequestration are ineffectual. This act is temporary.

# SECT. XIX. Of Prescriptions.

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PREScription, which is a method, both of establishing and of extinguishing property, is either positive or negative. Positive prescription is generally defined, as the Roman *usucapio*. The acquisition of property (it should rather be, when applied to our law, the securing it against all further challenge) by the possessor's continuing his possession for the time which law has declared sufficient for that purpose: negative, is the loss or amission of a right, by neglecting to follow it forth, or use it, during the whole time limited by law. The doctrine of prescription, which is, by some writers, condemned as contrary to justice, has been introduced, that the claims of negligent creditors might not subist for ever, that property might be at last fixed, and forgeries discouraged, which the difficulty of detecting must have made exceeding frequent, if no length of time had limited the legal effect of writings.

Prescription.

2. Positive prescription was first introduced into our law by 1617, c. 12. which enacts, that whoever shall have possessed his lands, annualrents, or other heritages, peaceably, in virtue of infestments, for 40 years continually after their dates, shall not thereafter be disquieted in his right by any person pretending a better title. Under heritages are comprehended every right that is *fundo annexum*, and capable of continual possession. Continued possession, if proved as far back as the memory of man, presumes possession upwards to the date of the infestment. The whole course of possession must by the act be founded on seifins; and consequently no part thereof on the bare right of apparenacy: but 40 years possession, without seifin, is sufficient in the prescription of such heritable rights as do not require seifin. The possession must also be without any *lawful* interruption, i. e. it must neither be interrupted *via falsi*, nor *via juris*. The prescription of subjects not expressed in the infestment as part and pertinent of another

Positive.

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other subject specially expressed, has been explained, No clxvii. 6.

3. The act requires, that the possessor produce, as his title of prescription, a charter of the lands, preceding the 40 years possession, with the feisin following on it; and where there is no charter extant, feisins, one or more, standing together for 40 years, and proceeding either on retours or precepts of *clare constat*. This has given rise to a reasonable distinction observed in practice, between the prescription of a singular successor, and of an heir. Singular successors must produce for their title of prescription, not only a feisin, but its warrant, as a charter, disposition, &c. either in their own person, or in that of their author: but the production, by an heir, of feisins, one or more, standing together for 40 years, and proceeding on retours or precepts of *clare constat*, is sufficient. The heir is not obliged to produce the retours or precepts on which his feisins proceed, nor is the singular successor obliged to produce the ground of his charter; so that if the title of prescription produced be a fair deed, and a sufficient title of property, the possessor is secure by the act, which admits no ground of challenge, but falsehood. A special statute, for establishing the positive prescription in moveable rights, was not necessary; for, since a title in writing is not requisite for the acquiring of these, the negative prescription, by which all right of action for recovering their property is cut off, effectually secures the possessor.

Negative  
prescription.

4. The negative prescription of obligations, by the lapse of 40 years, was introduced into our law long before the positive, by (1469, c. 29.—1474, c. 55.) This prescription is now amplified by the forefard act (1617), which has extended it to all actions competent upon heritable bonds, reversions, and others whatsoever; unless where the reversions are either incorporated in the body of the wadset-right, or registered in the register of reversions: And reversions so incorporated, or registered, are not only exempted from the negative prescription, but they are an effectual bar against any person from pleading the positive.

A shorter  
negative  
prescription.

5. A shorter negative prescription is introduced by statute, in certain rights and debts. Actions of spuilzie, ejection, and others of that nature, must be pursued within three years after the commission of the fact on which the action is founded. As in spuilzies and ejections, the pursuer was intitled, *in odium* of violence, to a proof by his own oath *in liem*, and to the violent profits against the defender, the statute meant only to limit these special privileges by a three years prescription, without cutting off the right of action, where the claim is restricted to simple restitution. Under the general words, and others of that nature, are comprehended all actions where the pursuer is admitted to prove his libel by his own oath *in liem*.

Prescription  
of serv-  
ants fees,  
&c.

6. Servants fees, house-rents, mens ordinaries, (*i. e.* money due for board), and merchants accounts, (all under the triennial prescription, (by 1579, c. 83.)) There is also a general clause subjoined to this statute, of other the like debts, which includes alimentary debts, wages due to workmen, and accounts due to writers, agents, or procurators. These debts may, by this act, be proved after the three years, either by the writing or oath of the debtor; so that they prescribe only as to the mean of proof by witnesses; but after the three

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years, it behoves the creditor to refer to the debtor's oath, not only the constitution, but the subsistence of the debt. In the prescription of house-rents, servants fees, and alimony, each term's rent, fee, or alimony, runs a separate course of prescription; so that in an action for these, the claim will be restricted to the arrears incurred within the three years immediately before the citation: But, in accounts, prescription does not begin till the last article; for a single article cannot be called an account. Actions of removing must also be pursued within three years after the warning. Reductions of erroneous retours, prescribe, if not pursued within 20 years.

7. Ministers stipends and mutes prescribe in five years after they are due; and arrears of rent, five years after the tenant's removing from the lands. As the prescription of mails and duties was introduced in favour of poor tenants, that they might not suffer by neglecting to preserve their discharges, a proprietor of lands subject to a liferent, who had obtained a lease of all the liferented lands from the liferenter, is not intitled to plead it, nor a tackman of one's whole estate, who had by the lease a power of removing tenants. Bargains concerning moveables, or sums of money which are proveable by witnesses prescribe, in five years after the bargain. Under these are included sales, locations, and all other consensual contracts, to the constitution of which writing is not necessary. But all the above mentioned debts, may, after the five years, be proved, either by the oath or the writing of the debtor; of which above, (par. 6.) A quinquennial prescription is established in arrelements, whether on decrees or depending actions: The first prescribe in five years after using the arrestment, and the last in five years after sentence is pronounced on the depending action.

8. No person binding for or with another, either as Limitation cautioner or co-principal, in a bond or contract for a sum of money, continues bound after seven years from the date of the bond, provided he has either a clause of relief in the bond, or a separate bond of relief, intimated to the creditor, at his receiving the bond. But all diligence used within the seven years against the cautioner, shall stand good. As this is a public law, intended to prevent the bad consequences of rash engagements, its benefit cannot, before the lapse of the seven years, be renounced by the cautioner. As it is correctory, it is strictly interpreted: Thus, bonds bearing a mutual clause of relief *pro rata*, fall not under it; nor bonds of corroboration, nor obligations, where the condition is not purified, or the term of payment not come within the seven years; because no diligence can be used on these. The statute excludes all cautioneries for the faithful discharge of offices; these not being obligations in a bond or contract for sums of money. And practice has denied the benefit of it to all judicial cautioners, as cautioners in a suspension. Actions of count and reckoning, competent either to minors against their tutors or curators, or *vice versa*, prescribe in ten years after the majority or death of the minor.

9. Holograph bonds, missive letters, and books of account, not attested by witnesses, prescribe in 20 years, unless the creditor shall thereafter prove the verity of the subscription by the debtor's oath. It is therefore sufficient to save from the effect of this prescription, that

Prescription  
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writing.

that the constitution of the debt be proved by the party's oath, after the 20 years; whereas in stipends, merchants accounts, &c. not only the constitution, but the subsistence of the debt, must be proved by writing or the debtor's oath, after the term of prescription. Some lawyers extend this prescription of holograph writings to all obligations for sums not exceeding L. 100 Scots, which are not attested by witnesses; because though these are in practice sustained, yet they ought not to have the same duration with deeds attested by witnesses. Though in the short prescriptions of debts, the right of action is for ever lost, if not exercised within the time limited; yet where action was brought on any of those debts, before the prescription was run, it subsisted, like any other right, for 40 years. As this defeated the purpose of the acts establishing these prescriptions, all processes upon warnings, spuilzies, ejections, or arrelements, or for payment of the debts contained in act 1669, c. 9. are by the said act, joined with 1685, c. 14. declared to prescribe in five years, if not wakened within that time; see N° clxxxiii. 26.

10. Certain obligations are lost by the lapse of less than 40 years, without the aid of statute, where the nature of the obligation, and the circumstances of parties, justify it: thus, bills which are not intended for lasting securities, produce no action, where the creditor has been long silent, unless the subsistence of the debt be proved by the debtor's oath; but the precise time is not fixed by practice. Thus also, a receipt for bills granted by a writer to his employer, not insisted upon for 23 years, was found not productive of an action. The prescriptions of the restitution of minors, of the benefit of inventory, &c. are explained in their proper places.

11. In the positive prescription, as established by the act 1617, the continued possession for 40 years, proceeding upon a title of property not chargeable with falsehood, secures the possessor against all other grounds of challenge, and so presumes *bona fides*, *presumptio juris et de jure*. In the long negative prescription, *bona fides* in the debtor is not required: the creditor's neglecting to insist for so long a time, is construed as an abandoning of his debt, and so is equivalent to a discharge. Hence, though the subsistence of the debt should be referred to the debtor's own oath, after the 40 years, he is not liable.

12. Prescription runs de momento in momentum: the whole time defined by law must be completed, before a right can be either acquired or lost by it; so that interruption, made on the last day of the fortieth year, breaks its course. The positive prescription runs against the sovereign himself, even as to his annexed property, but it is generally thought he cannot suffer by the negative: he is secured against the negligence of his officers, in the management of processes, by express statute, 1600, c. 14. The negative, as well as the positive prescription, runs against the church, though churchmen have but a temporary interest in their benefices. But because the rights of beneficiaries to their stipends are liable to accidents, through the frequent change of incumbents, 13 years possession does, by a rule of the Roman chancery which we have adopted, found a presumptive title in the beneficiary: but this is not properly prescription; for if by titles recovered, perhaps, out of the incumbent's own hands, it shall ap-

pear that he has possessed tithes, or other subjects, to a greater extent than he ought, his possession will be restricted accordingly. This right must not be confounded with that established in favour of churchmen, which is confined to church lands and rents, and constitutes a proper prescription upon a possession of 30 years.

13. The clause in the act 1617, saving minors from prescription, is extended to the positive, as well as to the negative prescription; but the exception of minority is not admitted in the case of hospitals for children, where there is a continual succession of minors, that being a *casus insolitus*. Minors are expressly excepted in several of the short prescriptions, as 1579, c. 18.—1669, c. 9.; but where law leaves them in the common case, they must be subject to the common rules.

14. Prescription does not run *contra non valentem agere*, against one who is barred, by some legal incapacity, from pursuing; for in such case, neither negligence nor dereliction can be imputed to him. This rule is, by a favourable interpretation, extended to wives who *ex reverentia maritales* forbear to pursue actions competent to them against their husbands. On the same ground, prescription runs only from the time that the debt or right could be sued upon. Thus, inhibition prescribes only from the publishing of the deed granted to the inhibitor's prejudice; and in the prescription of removings, the years are computed only from the term at which the defender is warned to remove. Neither can prescription run against persons who are already in possession, and so can gain nothing by a pursuit. Thus, where a person, who has two adjudications affecting the same lands, is in possession upon one of them, prescription cannot run against the other during such possession.

15. Certain rights are incapable of prescription: Certain (1.) Things that law has exempted from commerce. rights incapable of prescription. (2.) *Res mera facultatis*, e. g. a faculty to charge a subject with debts, to revoke, &c. cannot be lost by prescription; for faculties may, by their nature, be exercised at any time: hence, a proprietor's right of using any act of property on his own grounds, cannot be lost by the greatest length of time. (3.) Exceptions competent to a person for eliding an action, cannot prescribe, unless the exception is founded on a right productive of an action, e. g. compensation; such right must be insisted on, within the years of prescription. (4.) Obligations of yearly pensions or payments, tho' no demand has been made on them for forty years, do not suffer a total prescription, but still subsist as to the arrears fallen due within that period; because prescription cannot run against an obligation till it be payable, and each year's pension or payment is considered as a separate debt.

16. No right can be lost *non utendo* by one, unless the effect of that prescription be to establish it in another. Hence the rule arises, *juri sanguinis nunquam praescribitur*. Hence also, a proprietor of land cannot lose his property by the negative prescription, unless he who objects it can himself plead the positive. On the same ground, a superior's right of feu-duties cannot be lost *non utendo*; because being inherent in the superiority, it is truly a right of lands that cannot suffer the negative prescription, except in favour of one who can plead



plead the positive; which the vassal cannot do, being destitute of a title. This rule applies also to personage titles, which are an inherent burden upon all lands not specially exempted; and from which therefore the person liable cannot prescribe an immunity, by bare non-payment: but such vicarage titles as are only due where they are established by usage, may be lost by prescription. In all these cases, though the radical right cannot suffer the negative prescription, the by-gone duties, not demanded within the forty years, are lost to the proprietor, superior, or titular.

Interrup-  
tion of pre-  
scription.

17. Prescription may be interrupted by any deed, whereby the proprietor or creditor uses his right or ground of debt. In all interruptions, notice must be given to the possessor of the subject, or the debtor, that the proprietor or creditor intends to sue upon his right. All writings whereby the debtor himself acknowledges the debt, and all processes for payment brought or diligences used against him upon his obligation, by hording, inhibition, arrestment, &c. must be effectual to interrupt prescription.

18. Interruptions, by citation upon libelled summonses, where they are not used by a minor, prescribe, if not renewed every seven years: but where the appearance of parties, or any judicial act has followed thereupon, it is no longer a bare citation, but an action which subsists for forty years. Citations for interrupting the prescription of real rights must be given by messengers; and the summonses, on which such citations proceed, must pass the signet upon a bill, and be registered within sixty days after the execution, in a particular register appointed for that purpose: and where interruption of real rights is made *via facti*, an instrument must be taken upon it, and recorded in the said register; otherwise it can have no effect against singular successors.

19. Interruption has the effect to cut off the course of prescription, so that the person prescribing can avail himself of no part of the former time, but must begin a new course, commencing from the date of the interruption. Minority therefore is no proper interruption; for it neither breaks the course of prescription, nor is it a document or evidence taken by the minor on his right: it is a personal privilege competent to him, by which the operation of the prescription is indeed suspended during the years of minority, which are therefore discounted from it; but it continues to run after majority, and the years before and after the minority may be conjoined to complete it. The same doctrine applies to the privilege arising from one's incapacity to act.

20. Diligence used upon a debt, against any one of two or more co-obligants, preserves the debt itself, and so interrupts prescription against all of them; except in the special case of cautioners, who are not affected by any diligence used against the principal debtor. In the same manner, a right of annualrent, constituted upon two separate tenements, is preserved as to both from the negative prescription, by diligence used against either of them. But whether such diligence has also the effect to hinder the possessor of the other tenement by singular titles from the benefit of the positive prescription, may be doubted.

### III. OF SUCCESSION.

#### SECT. XX. Of Succession in heritable Rights.

class.

SINGULAR successors are those who succeed to a person yet alive, in a special subject by singular titles; but succession, in its proper sense, is a method of transmitting rights from the dead to the living. Heritable rights descend by succession to the heir properly so called; moveable rights, to the executors, who are sometimes said to be heirs in moveables. Succession is either by special destination, which descends to those named by the proprietor himself; or legal, which devolves upon the persons whom the law marks out for successors, from a presumption, that the proprietor would have named them had he made a destination. The first is in all cases preferred to the other, as presumption must yield to truth.

Successors  
singular and univer-  
sal.

2. In the succession of heritable, the heirs at law are otherwise called heirs general, heirs whatsoever, or heirs of line; and they succeed by the right of blood, in the following order. First, descendants sons are preferred to daughters, and the eldest son to all the younger. Where there are daughters only, they succeed equally, and are called heirs-portioners. Failing immediate descendants, grandchildren succeed; and in default of them, great-grandchildren; and so on in *infinitum*; preferring, as in the former case, males to females, and the eldest male to the younger.

Order of  
succession  
in heritags

3. Next after descendants, collateralers succeed; among whom the brothers *german* of the deceased have the first place. But as, in no case, the legal succession of heritable is, by the law of Scotland, divided into parts, unless where it descends to females; the immediate younger brother of the deceased excludes the rest, according to the rule, *heritage descends*. Where the deceased is himself the youngest, the succession goes to the immediate elder brother, as being the least deviation from this rule. If there are no brothers *german*, the sisters *german* succeed equally: then brothers *consanguinean*, in the same order as brothers *german*; and failing them, sisters *consanguinean* equally. Next, the father succeeds. After him, his brothers and sisters, according to the rules already explained; then the grand-father; failing him, his brothers and sisters; and so upwards, as far back as propinquity can be proved. Though children succeed to their mother, a mother cannot to her child; nor is there any succession by our law through the mother of the deceased; in so much that one brother *uterine*, i. e. by the mother only, cannot succeed to another, even in that estate which flowed originally from their common mother.

Collateral

No succe-  
sion by the  
mother.

4. In heritages there is a right of representation, by which one succeeds, not from any title in himself, but in the place of, and as representing some of his deceased ascendants. Thus, where one leaves a younger son, and a grandchild by his eldest, the grandchild, though farther removed in degree from the deceased than his uncle, excludes him, as coming in place of his father the eldest son. Hence arises the distinction between succession in *capita*, where the division is made into as many equal parts as there are *capita* or heirs, which is the case of heirs-portioners; and succession in *stirpes*, where the remoter heirs draw no more among them than the share belonging to their ascendent or *stirps*, whom

Succession  
in capita  
and in  
stirpe.

whom

Law of Scotland. how they represent; an example of which may be figured in the case of one who leaves behind him a daughter alive, and two grand-daughters by a daughter deceased. In which case the two grand-daughters would succeed equally to that half which would have belonged to their mother had she been alive.

Succession by destination. 5. In the succession of heirs-portioners, indivisible rights, *e. g.* titles of dignity, fall to the eldest sister. A single right of superiority goes also to the eldest; for it hardly admits a division, and the condition of the vassal ought not to be made worse by multiplying superiors upon him. Where there are more such rights, the eldest may perhaps have her election of the best; but the younger sisters are intitled to a recompence, in so far as the divisions are unequal; at least, where the superiorities yield a constant yearly rent. The principal seat of the family falls to the eldest, with the garden and orchard belonging to it, without recompence to the younger sisters; but all other houses are divided amongst them, together with the lands on which they are built, as parts and pertinents of these lands.

6. Those heritable rights, to which the deceased did himself succeed as heir to his father or other ancestor, get sometimes the name of heritance in a strict sense, in opposition to the *feuda nova*, or fees of conquest, which he had acquired by singular titles, and which descend, not to his heir of line, but of conquest. This distinction obtains only, where two or more brothers or uncles, or their issue, are next in succession; in which case, the immediate younger brother, as heir of line, succeeds to the proper heritance, because that descends; whereas the conquest ascends to the immediate elder brother. It has no place in female succession, which the law divides equally among the heirs-portioners. Where the deceased was the younger brother, the immediate elder brother is heir both of line and of conquest. An estate disposed by a father to his eldest son, is not conquest in the son's person, but heritance; because the son would have succeeded to it, though there had been no disposition. The heir of conquest succeeds to all rights affecting land, which require seisin to perfect them. But he does not to the heir of line; because they are merely a burden on the fruits, not on the land. Tacks do not fall under conquest, because they are complete rights without seisin; nor personal bonds taken to heirs excluding executors.

Heirship-vestibles. 7. The heir of line is entitled to the succession, not only of subjects properly heritable, but to that sort of moveables called *heirships*, which is the best of certain kinds. This doctrine has been probably introduced, that the heir might not have an house and estate to succeed to, quite dismantled by the executor. In that sort which goes by pairs or dozens, the best pair or dozen is the heirship. There is no heirship in fungibles, or things estimated by quantity; as grain, hay, current money, &c. To entitle an heir to this privilege, the deceased must have been either, (1.) A prelate: (2.) A baron, *i. e.* who stood inest at his death in lands, tho' not erected into a barony; or even in a right of annualrent: Or, (3.) A burgess; not an honorary one, but a trading burgess of a royal borough, or at least one entitled to enter burgess in the right of his ancestor. Neither the heir of conquest, nor of talzie, has right to heirship-moveables.

8. As to succession by destination, no proprietor can

fettle any heritable estate, in the proper form of a testament; not even bonds including executors, tho' these are not heritable *ex sua natura*: But, where a testament is in part drawn up in the style of a deed *inter vivos*, such part of it may contain a settlement of heritance, though executors should be named in the testamentary part. The common method of settling the succession of heritance is by disposition, contract of marriage, or simple procuratory of resignation: and, tho' a disposition settling heritance should have neither precept nor procuratory, it founds an action against the heir of line to complete his titles to the estate; and therefore divest himself in favour of the disponee. The appellation of talzie, or entail, is chiefly used in the case of a land estate, which is settled on a long series of heirs, substituted one after another. The person first called in the talzie, is the institute; the rest, the heirs of talzie, or the substitutes.

9. Tailzies, when considered in relation to their several degrees of force, are either, (1.) Simple destination: (2.) Tailzies with prohibitory clauses. (3.) Tailzies with prohibitory, resolute, and irritant clauses. That is a simple destination, where the persons called to the succession are substituted one after another, without any restraint laid on the exercise of their property. The heirs, therefore, succeeding to such estate, are absolute heirs, and consequently may alter the destination at pleasure.

10. In talzies with clauses prohibitory, *e. g.* declaring that it shall not be lawful to the heirs to contract debts or alien the lands in prejudice of the succession, none of the heirs can alien gratuitously. But the members of entail may contract debts which will be effectual to the creditors, or may dispose of the estate for onerous causes. In both these sorts, the maker himself may alter the talzie; except, (1.) Where it has been granted for an onerous cause, as in mutual talzies; or, (2.) Where the maker is expressly disabled, as well as the institute or the heirs.

11. Where a talzie is guarded with irritant and resolute clauses, the estate entailed cannot be carried off by the debt, or deed, of any of the heirs succeeding thereto, in prejudice of the substitutes. It was long doubted, whether such talzies ought to be effectual, even where the superior's consent was adhibited; because they sunk the property of estates, and created a perpetuity of liferents. They were first explicitly authorized by 1685, c. 22. By this statute, the entail must be registered in a special register established for that purpose; and the irritant and resolute clauses must be inserted, not only in the procuratories, precepts, and seisins, by which the talzies are first constituted, but in all the after-conveyances thereof; otherwise they can have no force against singular successors. But a talzie, even without these requisites, is effectual against the heir of the granter, or against the institute who accepts of it.

12. An heir of entail has full power over the entailed estate, except in so far as he is expressly fettered; and as entails are an unfavourable restraint upon property, and a frequent snare to trading people, they are *strictissimi juris*; so that no prohibition or irritancies are to be inferred by implication. By 10 George III. c. 51. heirs of entail are entitied (notwithstanding any restrictions in the deed of entail) to improve their estates by

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by granting leases, building farm-houses, draining, inclosing, and exchanging, under certain limitations, and to claim repayment of three-fourths of the expence from the next heir of entail.—This act extends to all tailzies, whether made prior or posterior to the 1685.

Contraven-  
tion, by  
whom in-  
ferred.

13. An heir, who counteracts the directions of the tailzie, by aliening any part of the estate, charging it with debt, &c. is said to contravene. It is not the simple contracting of debt that infers contravention; the lands entailed must be actually adjudged upon the debt contracted. An heir may, where he is not expressly barred, settle rational provisions on his wife and children, without incurring contravention.

In what  
cases an heir  
may sell.

14. When the heirs of the last person specially called in a tailzie come to succeed, the irritations have no longer any person in favour of whom they can operate; and consequently, the fee, which was before tailzied, becomes simple and unlimited in the person of such heirs. The king may purchase lands within Scotland, notwithstanding the strictest entail; and where the lands are in the hands of minors or fatuous persons, his majesty may purchase them from the curators or guardians. And heirs of entail may sell to their vassals the superiorities belonging to the entailed estate; but in all these cases, the price is to be settled in the same manner that the lands or superiorities sold were settled before the sale.

Rights  
taken in  
conjunct  
fee.

15. Rights, not only of land-estates, but of bonds, are sometimes granted to two or more persons in conjunct fee. Where a right is so granted to two strangers, without any special clause adjoined to it, each of them has an equal interest in the fee, and the part of the deceased descends to his own heir. If the right be taken to the two jointly, and the *longest liver* and their heirs, the several shares of the conjunct fiars are affectable by their creditors during their lives; but, on the death of any one of them, the survivor has the fee of the whole, in so far as the share of the predeceased remains free, after payment of his debts. Where the right is taken to the two in conjunct fee, and to the heirs of one of them, he to whose heirs the right is taken is the only fiar; the right of the other resolves into a simple liferent: yet where a father takes a right to himself and his son jointly, and to the son's heirs, such right being gratuitous, is not understood to strip the father of the fee, unless a contrary intention shall plainly appear from the tenor of the right.

16. Where a right is taken to a husband and wife, in conjunct fee and liferent, the husband, as the *persona dignior*, is the only fiar: the wife's right resolves into a liferent, unless it be presumable, from special circumstances, that the fee was intended to be in the wife. Where a right of moveables is taken to husband and wife, the heirs of both succeed equally, according to the natural meaning of the words.

Heirs of  
provision.

17. Heirs of provision are those who succeed to any subject, in virtue of a provision in the investiture, or other deed of settlement. This appellation is given most commonly to heirs of a marriage. There are more favourably regarded than heirs by simple destination, who have only the hope of succession; for heirs of a marriage, because their provisions are constituted by an onerous contract, cannot be disappointed of them by any gratuitous deed of the father. Nevertheless, as their right is only a right of succession, which is not

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designed to restrain the father from granting onerous or rational deeds, he continues to have the full power of selling the subject, or charging it with debts, unless a proper right of credit be given to the heir by the marriage-contract, e. g. if the father should oblige himself to invest the heir in the lands, or make payment of the sum provided against a day certain, or when the child attains a certain age, &c.; for such rights, when perfected by investiture, or secured by diligence, are effectual against all the posterior deeds of the father, even onerous.

Effects of  
provision to  
children.

18. Tho' all provisions to children, by a marriage-contract conceived in the ordinary form, being merely rights of succession, are postponed to every onerous debt of the grantor, even to those contracted posterior to the provisions; yet where a father executes a bond of provision to a child actually existing, whether such child be the heir of a marriage or not, a proper debt is thereby created, which, though it be without doubt gratuitous, is not only effectual against the father himself and his heirs, but is not reducible at the instance even of his prior onerous creditors, if he was solvent at the time of granting it. A father may, notwithstanding a first marriage-contract, settle a jointure on a second wife, or provide the children of a second marriage; for such settlements are deemed onerous; but where they are exorbitant, they will be restricted to what is rational: and in all such settlements, where the provisions of the first marriage-contract are encroached upon, the heirs of that marriage have recourse against the father, in case he should afterwards acquire a separate estate; which may enable him to fulfil both obligations.

Provision  
to heirs.

19. Where heritable rights are provided to the heirs of a marriage, they fall to the eldest son, for he is the heir at law in heritage. Where a sum of money is so provided, the word *heir* is applied to the subject of the provision, and so marks out the executor, who is the heir in moveables. When an heritable right is provided to the *bairns* (or issue) of a marriage, it is divided equally among the children, if no provision be made by the father; for such destination cuts off the exclusive right of the legal heir. No provision granted to bairns, gives a special right of credit to any one child, as long as the father lives: the right is granted *familia*; so that the whole must indeed go to one or other of them; but the father has a power inherent in him, to divide it among them, in such proportions as he thinks best; yet so as none of them may be entirely excluded, except in extraordinary cases.

To bairns.

20. A clause of return is that, by which a sum in a bond or other right, is, in a certain event, limited to return to the grantor himself, or his heirs. When a right is granted for onerous causes, the creditor may defeat the clause of return, even gratuitously. But, where the sum in the right flows from the grantor, or where there is any other reasonable cause for the provision of return in his favour, the receiver cannot disappoint it gratuitously. Yet since he is fiar, the sum may be either assigned by him for an onerous cause, or affected by his creditors.

Clause of  
return.

21. An heir is, in the judgment of law, *eadem persona cum defuncto*, and so represents the deceased universally, not only in his rights but in his debts: in the first view, he is said to be *heir active*; in the second, *passive*. From this general rule are excepted, heirs substituted

Heirs.



stituted in a special bond, and even substituted in a disposition *omnium bonorum*, to take effect at the grantor's death; for such substitutes are considered as singular successors, and their right as an universal legacy, which does not subject the legatee *ultra valorem*.

22. Before an heir can have an active title to his ancestor's rights, he must be entered by service and retour. He who is entitled to enter heir, is, before his actual entry, called apparent heir. The bare right of appearance carries certain privileges with it. An apparent heir may defend his ancestor's titles against any third party who brings them under challenge. Tenants may safely pay him their rents; and after they have once acknowledged him by payment, he may compel them to continue it; and the rents not uplifted by the apparent heir belong to his executors, upon his death.

23. As an heir is, by his entry, subjected universally to his ancestor's debts, apparent heirs have therefore a year (*annus deliberandi*) allowed to them from the ancestor's decease, to deliberate whether they will enter or not; till the expiring of which, though they may be charged by creditors to enter, they cannot be sued in any process founded upon such charge. Though declaratory actions, and others which contain no personal conclusion, may be pursued against the apparent heir, without a previous charge; actions do not lie even upon these, within the year, if the heir cannot make the proper defences without incurring a passive title. But judicial sales, commenced against an ancestor, may be continued upon a citation of the heir, without waiting the year of deliberating. This *annus deliberandi* is computed, in the case of a posthumous heir, from the birth of such heir. An apparent heir, who, by immixing with the estate of his ancestor, is as much subjected to his debts as if he had entered, can have no longer a right to deliberate whether he will enter or not.

24. All services proceed on briefs from the chancery, which are called briefs of inquest, and have been long known in Scotland. The judge, to whom the brief is directed, is required to try the matter by an inquest of fifteen sworn men. The inquest, if they find the claim verified, must declare the claimant heir to the deceased, by a verdict or service, which the judge must attest, and return the brief, with the service proceeding on it, to the chancery.

25. The service of heirs is either general or special. A general service vests the heir in the right of all heritable subjects, which either do not require seisin, or which have not been perfected by seisin in the person of the ancestor. A special service, followed by seisin, vests the heir in the right of the special subjects in which the ancestor died intestate.

26. If an heir, doubtful whether the estate of his ancestor be sufficient for clearing his debts, shall, at any time within the *annus deliberandi*, exhibit upon oath a full inventory of all his ancestor's heritable subjects, to the clerk of the shire where the lands lie; or, if there is no heritage requiring seisin, to the clerk of the shire where he died; and if, after the same is subscribed by the sheriff or sheriff-depute, the clerk, and himself, and registered in the sheriff's books, the extract thereof shall be registered within forty days after expiry of the *annus deliberandi* in the general register appointed for

that purpose, his subsequent entry will subject him no farther than to the value of such inventory. If the inventory be given up and registered within the time prescribed, the heir may serve on it, even after the year.

27. Creditors are not obliged to acquiesce in the value of the estate given up by the heir; but, if they be real creditors, may bring the estate to a public sale, in order to discover its true value; since an estate is always worth what can be got for it. An heir by inventory, as he is, in effect, a trustee for the creditors, must account for that value to which the estate may have been improved since the death of the ancestor, and he must communicate to all the creditors the cases he has got in transacting with any one of them.

28. Practice has introduced an anomalous sort of entry, without the interposition of an inquest, by the sole consent of the superior, who, if he be satisfied that the person applying to him is the next heir, grants him a precept (called of *clare constat*, from the first words of its recital), commanding his bailie to insert him in the subjects that belonged to his ancestor. These precepts are, no doubt, effectual against the superior who grants them, and his heirs; and they may, when followed by seisin, afford a title of prescription: But as no person can be declared an heir by private authority, they cannot bar the true heir from entering after 20 years, as a legal entry would have done. Of the same nature is the entry by haip and staple, commonly used in burgage tenements of houses; by which the bailie, without calling an inquest, cognosces or declares a person heir, upon evidence brought before himself; and, at the same time inserts him in the subject, by the symbol of the haip and staple of the door. Charges given by creditors to apparent heirs to enter, stand in the place of an actual entry, so as to support the creditor's diligence.

29. A general service cannot include a special one; since it has no relation to any special subject, and carries only that class of rights on which seisin has not proceeded; but a special service implies a general one of the same kind or character, and consequently carries even such rights as have not been perfected by seisin. Service is not required to establish the heir's right in titles of honour, or offices of the highest dignity; for these descend *jure sanguinis*.

30. An heir, by immixing with his ancestor's estate without entry, subjects himself to his debts, as if he had entered; or, in our law-phrase, incurs a passive title. The only passive title by which an apparent heir becomes liable universally for all his ancestor's debts, is *gestio pro herede*, or his behaving as none but an heir has right to do. Behaviour as heir is inferred, from the apparent heir's intromission, after the death of the ancestor, with any part of the lands or other heritable subjects belonging to the deceased, to which he himself might have completed an active title by entry.

31. This passive title is excluded, if the heir's intromission be by order of law; or if it be founded on singular titles, and not as heir to the deceased. But an apparent heir's purchasing any right to his ancestor's estate, otherwise than at public roup (auction), or his possessing it in virtue of rights settled in the person of any near relation of the ancestor, to whom he himself may succeed as heir, otherwise than upon purchase

Entry upon  
a precept of  
*clare constat*.

Entry by  
haip and  
staple.

A special  
service in-  
cludes a ge-  
neral one.

Passive  
titles.

*Gestio pro  
herede*.

purchase

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chafe by public sale, is deemed behaviour as heir.

32. Behaviour as heir is also excluded, where the intromission is small, unless an attention to defraud the ancestor's creditors be prefinable from the circumstances attending it. Neither is behaviour inferred against the apparent heir, from the payment of his ancestor's debt, which is a voluntary act, and profitable to the creditors: nor by his taking out of briefs to serve; for one may alter his purpose, while it is not completed: nor by his assuming the titles of honour belonging to his ancestor, or exercising an honorary office hereditary in the family; for these are rights annexed to the blood, which may be used without proper representation. But the exercising an heritable office of profit, which may pass by voluntary conveyance, and consequently is adjudgeable, may reasonably be thought to infer a passive title. Lastly, as passive titles have been introduced, merely for the security of creditors; therefore, where questions concerning behaviour arise among the different orders of heirs, they are liable to one another no farther than *in valore* of their several intromissions.

Præceptio  
hereditatis.

33. Another passive title in heritage, may be incurred by the apparent heir's accepting a gratuitous right from the ancestor, to any part of the estate to which he himself might have succeeded as heir; and it is called *præceptio hereditatis*, because it is a taking of the succession by the heir before it opens to him by the death of his ancestor. If the right be onerous, there is no passive title; if the consideration paid for it does not amount to its full value, the creditors of the deceased may reduce it, in so far as it is gratuitous, but still it infers no passive title.

34. The heir incurring this passive title is no farther liable, than if he had at the time of his acceptance entered heir to the granter, and so subjected himself to the debts that were then chargeable against him; but with the posterior debts he has nothing to do, not even with those contracted between the date of the right, and the infestment taken upon it, and he is therefore called *successor titulo lucrativo post contractum debitum*.

35. Neither of these passive titles takes place, unless the subject intermeddled with or disposed be such as the intromitter or receiver would succeed to as heir. In this also, these two passive titles agree, that the intromission in both must be after the death of the ancestor; for there can be no *termini habiles* of a passive title, while the ancestor is alive. But in the following respect they differ: *Gessio pro herede*, being a vicious passive title founded upon a quasi delict, cannot be objected against the delinquent's heir, if process has not been litiscontested while the delinquent himself was alive; whereas the *successor titulo lucrativo* is by the acceptance of the disposition understood to have entered into a tacit contract with the granter's creditors, by which he undertakes the burden of their debts; and all actions founded on contract are transmissible against heirs.

Other pas-  
sive titles.

36. An apparent heir, who is cited by the ancestor's creditor in a process for payment, if he offers any peremptory defence against the debt, incurs a passive title; for he can have no interest to object against it, but in the character of heir. In the same manner, the heir's not renouncing upon a charge to enter heir, infers it: But the effect of both these is limited to the special

debt pursued for, or charged upon. This passive title, which is inferred from the heir's not renouncing, has no effect till decree pass against him; and even a renunciation offered after decree, if the decree be in absence, will intitle the heir to a suspension of all diligence against his person and estate, competent upon his ancestor's debts.

37. By the principles of the feudal law, an heir, when he is to complete his titles by special service, must necessarily pass over his immediate ancestor, *e. g.* his father, if he was not infest; and serve heir to that ancestor who was last velt and seised in the right, and in whose *hereditas jacens* the right must remain, till a title be connected thereto from him. As this bore hard upon creditors who might think themselves secure in contracting with a person whom they saw for some time in the possession of an estate, and from thence conclude that it was legally vested in him; it is therefore provided, that every person, passing over his immediate ancestor who had been three years in possession, and serving heir to one more remote, shall be liable for the debts and deeds of the person interjected, to the value of the estate to which he is served. This being correctory of the feudal maxims, has been strictly interpreted, so as not to extend to the gratuitous deeds of the person interjected, nor to the case where the interjected person was a naked fiar, and possessed only civilly thro' the liferenter.

38. Our law, from its jealousy of the weakness of mankind while under sickness, and of the importunity of friends on that occasion, has declared that all deeds affecting heritage, if they be granted by a person on death-bed, (*i. e.* after contracting that sickness which ends in death), to the damage of the heir, are ineffectual, except where the debts of the granter have laid him under a necessity to alien his lands. As this law of deathbed is founded solely in the privilege of the heir, deathbed-deeds, when consented to by the heir, are not reducible. The term properly opposed to deathbed is *liege poustie*, by which is understood a state of health; and it gets the name, because persons in health have the *legitima potestas*, or lawful power, of disposing of their property at pleasure.

39. The two extremes being proved, of the granter's sickness immediately before signing, and of his death following it, though at the greatest distance of time; did, by our former law, found a presumption that the deed was granted on death-bed, which could not have been elided but by a positive proof of the granter's convalescence; but now the allegation of death-bed is also excluded, by his having lived 60 days after signing the deed. The legal evidence of convalescence is the granter's having been, after the date of the deed, at kirk OR market unsupported; for a proof of either will secure the deed from challenge. The going to kirk or market must be performed when the people are met together in the church or churchyard for any public meeting, civil or ecclesiastical, or in the market-place at the time of public market. No other proof of convalescence is receivable, because at kirk and market there are always present unsuspected witnesses, which we can hardly be sure of in any other case.

40. The privilege of setting aside deeds *ex capite lesti*, is competent to all heirs, not to heirs of line only; but of conquest, tailzie, or provision; not only to the immediate,

Law of  
Scotland.Reducible  
by the heir  
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immediate, but to remoter heirs, as soon as the succession opens to them. But, where it is consented to or ratified by the immediate heir, it is secured against all challenge, even from the remoter. Yet the immediate heir cannot, by any antecedent writing, renounce his right of reduction, and thereby give strength to deeds that may be afterwards granted *in lecto* to his hurt; for no private renunciation can authorise a person to act contrary to a public law; and such renunciation is presumed to be extorted through the fear of exheredation. If the heir should not use this privilege of reduction, his creditor may, by adjudication, transfer it to himself; or he may, without adjudication, reduce the deed, libelling upon his interest as creditor to the heir: But the grantor's creditors have no right to this privilege, in regard that the law of death-bed was introduced, not in behalf of the grantor himself, but of his heir.

41. The law of death-bed strikes against dispositions of every subject to which the heir would have succeeded, or from which he would have had any benefit, had it not been so disposed. Death-bed-deeds granted in consequence of a full or proper obligation in *liege possit*, are not subject to reduction; but, where the antecedent obligation is merely natural, they are reducible. By stronger reason, the deceased cannot, by a deed merely voluntary, alter the nature of his estate on death-bed to the prejudice of his heir, so as from heritable to make it moveable; but if he should, in *liege possit*, exclude his apparent heir, by an irrevocable deed containing reserved faculties, the heir cannot be heard to quarrel the exercise of these faculties on death-bed.

42. In a competition between the creditors of the deceased and of the heir, our law has justly preferred the creditors of the deceased, as every man's estate ought to be liable, in the first place, for his own debt. But this preference is, by the statute, limited to the case where the creditors of the deceased have used diligence against their debtor's estate, within three years from his death; and therefore the heir's creditors may, after that period, affect it for their own payment. All dispositions by an heir, of the ancestor's estate, within a year after his death, are null, in so far as they are hurtful to the creditors of the ancestor. This takes place, though these creditors should have used no diligence, and even where the dispositions are granted after the year: It is thought they are ineffectual against the creditors of the deceased who have used diligence within the three years.

### SECT. XXI. Of Succession in Moveables.

In the succession of moveable rights, it is an universal rule, that the next in degree to the deceased (or next of kin) succeeds to the whole; and if there are two or more equally near, all of them succeed by equal parts, without that prerogative, which takes place in heritage, of the eldest son over the younger, or of males over females. Neither does the right of representation, explained N<sup>o</sup> clxxx. 4. obtain in the succession of moveables, except in the single case of a competition between the full blood and the half blood; for a niece by the full blood will be preferred before a brother by the half blood, though she is by one degree more remote from the deceased than her uncle. Where the estate of a person deceased consists partly of heritage,

and partly of moveables, the heir in the heritage has no share of the moveables, if there are others as near in degree to the deceased as himself: But where the heir, in such case, finds it his interest to renounce his exclusive claim to the heritage, and betake himself to his right as one of the next of kin, he may collate or communicate the heritage with the others, who in their turn must collate the moveables with him; so that the whole is thrown into one mass, and divided equally among all of them. This doctrine holds, not only in the line of descendants, but of collaterals; for it was introduced, that the heir might in no case be worse than the other next of kin.

2. One may settle his moveable estate upon whom he pleases, excluding the legal successor, by a testament; which is a written declaration of what a person wills to be done with his moveable estate after his death. No testamentary deed is effectual, till the death of the testator; who may therefore revoke it at pleasure, or make a new one, by which the first loses its force; and hence testaments are called *last* or *latter-wills*. Testaments in their strict acceptation, must contain a nomination of executors, *i. e.* of persons appointed to administer the succession according to the will of the deceased: Yet nothing hinders one from making a settlement of moveables, in favour of an universal legatee, though he should not have appointed executors; and on the other part, a testament where executors are appointed, is valid, though the person who is to have the right of succession should not be named. In this last case, if the executor nominated be a stranger, *i. e.* one who has no legal interest in the moveable estate, he is merely a trustee, accountable to the next of kin; but he may retain a third of the dead's part (explained par. 6.) for his trouble in executing the testament; in payment of which, legacies, if any be left to him, must be imputed. The heir, if he be named executor, has right to the third as a stranger; but if one be named who has an interest in the legal succession, he has no allowance, unless such interest be less than a third. Nuncupative or verbal testaments are not, by the law of Scotland, effectual for supporting the nomination of an executor, let the subject of the succession be ever so small: But verbal legacies, not exceeding *L. 100 Scots*, are sustained; and even where they are granted for more, they are ineffectual only as to the excess.

3. A legacy is a donation by the deceased, to be paid by the executor to the legatee. It may be granted either in the testament or in a separate writing. Legacies are not due till the grantor's death; and consequently they can transmit no right to the executors of the legatee, in the event that the grantor survives him.

4. Legacies, where they are general, *i. e.* of a certain sum of money indefinitely, give the legatee no right in any one debt or subject; he can only insist in a personal action against the executor, for payment out of the testator's effects. A special legacy, *i. e.* of a particular debt due to the deceased, or of a particular subject belonging to him, is of the nature of an assignment, by which the property of the special debt or subject vests, upon the testator's death, in the legatee, who can therefore directly sue the debtor or possessor: Yet as no legacy can be claimed till the debts are paid, the executor must be cited in such process, that it may be known, whether there are free effects sufficient for

Succession  
in move-  
ables by de-  
termination.

Legacy.



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Scotland.

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Scotland.

answering the legacy. Where there is not enough for payment of all the legacies, each of the general legatees must suffer a proportional abatement : But a special legatee gets his legacy entire, though there should be nothing over for payment of the rest ; and, on the contrary, he has no claim, if the debt or subject bequeathed should perish, whatever the extent of the free execruty may be.

Who can  
test, and  
under what  
restrictions.

5. Minors, after puberty, can test without their curators, wives without their husbands, and persons interdicted without their interdictors : but bastards cannot tell, except in the cases afterwards set forth, No clxxii. 3. As a certain share of the goods, falling under the communion that is consequent on marriage, belongs, upon the husband's decease, to his widow, *jure relicte*, and a certain share to the children, called the *legitime*, *portion-natural*, or *bairns part of gear* ; one who has a wife or children, though he be the absolute administrator of all these goods during his life, and consequently may alien them by a deed *inter vivos* in *liege poultie*, even gratuitously, if no fraudulent intention to disappoint the wife or children shall appear, yet cannot impair their shares gratuitously on death-bed ; nor can he dispose of his moveables to their prejudice by testament, though it should be made in *liege poultie* ; since testaments do not operate till the death of the testator, at which period the division of the goods in communion have their full effect in favour of the widow and children.

Division of  
a testament.

6. If a person deceased leaves a widow, but no child, his testament, or, in other words, the goods in communion, divide in two : one half goes to the widow ; the other is the dead's part, *i. e.* the absolute property of the deceased, on which he can test, and which falls to his next of kin, if he dies intestate. Where he leaves children, one or more, but no widow, the children get one half as their legitime : the other half is the dead's part ; which falls also to the children, if the father has not tested upon it. If he leaves both widow and children, the division is tripartite : the wife takes one third by herself ; another falls, as legitime, to the children equally among them, or even to an only child, though he should succeed to the heritage ; the remaining third is the dead's part. Where the wife predeceases without children, one half is retained by the husband, the other falls to her next of kin : Where she leaves children, the division ought also to be bipartite, by the common rules of society, since no legitime is truly due on a mother's death : yet it is in practice tripartite ; two thirds remain with the surviving father, as if one third were due to him *proprio nomine*, and another as administrator of the legitime for his children ; the remaining third, being the wife's share, goes to her children, whether of that or any former marriage, for they are all equally her next of kin.

What debts  
affect the  
execruty.

7. Before a testament can be divided, the debts owing by the deceased are to be deducted ; for all execruty must be free. As the husband has the full power of burdening the goods in communion, his debts affect the whole, and so lessen the legitime and the share of the relic, as well as the dead's part. His funeral charges, and the mournings and alimony due to the widow, are considered as his proper debts ; but the legacies, or other gratuitous rights, granted by him on death-bed, affect only the dead's part. Bonds bearing interest, due by the deceased, cannot diminish the relic's share,

because such bonds, when due to the deceased, do not increase it. The funeral charges of the wife predeceasing, fall wholly on her executors who have right to her share. Where the deceased leaves no family, neither husband, wife, nor child, the testament suffers no division, but all is the dead's part.

8. The whole issue of the husband, not only by that marriage which was dissolved by his death, but by any former marriage, has an equal interest in the legitime ; otherwise the children of the first marriage would be cut out, as they could not claim the legitime during their father's life. But no legitime is due, (1.) Upon the death of a mother. (2.) Neither is it due to grandchildren, upon the death of a grandfather. Nor, (3.) To children forisfamiliated, *i. e.* to such as, by having renounced the legitime, are no longer considered as in *familia*, and so are excluded from any further share of the moveable estate than they have already received.

9. As the right of legitime is strongly founded in nature, the renunciation of it is not to be inferred by implication. Renunciation by a child of his claim of legitime has the same effect as his death, in favour of the other children intitled thereto ; and consequently the share of the renouncer divides among the rest ; but he does not thereby lose his right to the dead's part, if he does not also renounce his share in the father's execruty. Nay, his renunciation of the legitime, where he is the only younger child, has the effect to convert the whole subject thereof into dead's part, which will therefore fall to the renouncer himself as next of kin, if he be not willing to collate the heritage with him.

Renunciation of  
legitime.

10. For preserving an equality among all the children, who continue intitled to the legitime, we have adopted the Roman doctrine of *collatio bonorum* ; whereby the child, who has got a provision from his father, is obliged to collate it with the others, and impute it towards his own share of the legitime ; but if, from the deed of provision, the father shall appear to have intitled it as a *præcipuum* to the child, collation is excluded. A child is not bound to collate an heritable subject provided to him, because the legitime is not impaired by such provision. As this collation takes place only in questions among children who are intitled to the legitime, the relic is not bound to collate donations given her by her husband, in order to increase the legitime ; and on the other part, the children are not obliged to collate their provisions, in order to increase her share.

Collation  
among  
younger  
children.

11. As an heir in heritage must complete his titles by entry, so an executor is not vested in the right of the moveable estate of the deceased without confirmation. Confirmation is a sentence of the commissary or bishop's court, empowering an executor, one or more, upon making inventory of the moveables pertaining to the deceased, to recover, possess, and administer them, either in behalf of themselves, or of others interested therein. Testaments must be confirmed in the commissariat where the deceased had his principal dwelling-house at his death. If he had no fixed residence, or died in a foreign country, the confirmation must be at *Edinburgh*, as the *communis forum* ; but if he went abroad with an intention to return, the commissariat within which he resided, before he left Scotland, is the only proper court.

Confirmation.

12. Confirmation proceeds upon an edict, which is affixed on the door of the parish-church where the deceased dwelt, and serves to intimate to all concerned the day of confirmation, which must be nine days at least after publishing the edict. In a competition for the office of executor, the commissary prefers, *primo loco*, the person named to it by the deceased himself, whose nomination he ratifies or confirms, without any previous decerniture: this is called the confirmation of a testament-testamentary. In default of an executor named by the deceased, universal disponses are by the present practice preferred; after them, the next of kin; then the relict; then creditors; and, lastly, special legatees. All these must be decerned executors, by a sentence called a *decree-dative*; and if afterwards they incline to confirm, the commissary authorizes them to administer, upon their making inventory, and giving security to make the subject thereof forthcoming to all having interest; which is called the confirmation of a testament-dative.

13. A creditor, whose debtor's testament is already confirmed, may sue the executor, who holds the office for all concerned, to make payment of his debt. Where there is no confirmation, he himself may apply for the office, and confirm as executor-creditor; which intitles him to sue for and receive the subject confirmed, for his own payment: and where one applies for a confirmation as executor-creditor, every co-creditor may apply to be conjoined with him in the office. As this kind of confirmation is simply a form of diligence, creditors are exempted from the necessity of confirming more than the amount of their debts.

14. A creditor, whose debt has not been constituted, or his claim not closed by decree, during the life of his debtor, has no title to demand directly the office of executor *qua* creditor: but he may charge the next of kin who stands off, to confirm, who must either renounce within twenty days after the charge, or be liable for the debt; and if the next of kin renounces, the pursuer may constitute his debt, and obtain a decree *cognitionis causâ*, against the *hereditas jacens* of the moveables, upon which he may confirm as executor-creditor to the deceased. Where one is creditor, not to the deceased, but to his next of kin who stands off from confirming, he may affect the moveables of the deceased, by obtaining himself decerned executor-dative to the deceased, as if he were creditor to him, and not to his next of kin.

15. Where an executor has either omitted to give up any of the effects belonging to the deceased in inventory, or has estimated them below their just value, there is place for a new confirmation, *ad omnia, vel male appretiatâ*, at the suit of any having interest; and if it appears that he has not omitted or undervalued any subject *dolese*, the commissary will ordain the subjects omitted, or the difference between the estimations in the principal testament and the true values, to be added thereto; but if dole shall be presumed, the whole subject of the testament *ad omnia vel male appretiatâ*, will be carried to him who confirms it, to the exclusion of the executor in the principal testament.

16. The legitimate relict's share, because they are rights arising *ex lege*, operate *ipso jure*, upon the father's death, in favour of the relict and children; and consequently pass from them, though they should die before

confirmation, to their next of kin: whereas the dead's part, which falls to the children or other next of kin in the way of succession, remains, if they should die before confirming, *in bonis* of the first deceased; and so does not descend to their next of kin, but may be confirmed by the person who, at the time of confirmation, is the next of kin to the first deceased. Special assignations, though neither intimated, nor made public, during the life of the granter, carry to the assignee the full right of the subjects assigned, without confirmation. Special legacies are really assignations, and so fall under this rule. The next of kin, by the bare possession of the *ipsa corpora* of moveables, acquires the property thereof without confirmation, and transmits it to his executors.

17. The confirmation of any one subject by the next of kin, as it proves his right of blood, has been adjudged to carry the whole executry out of the testament of the deceased, even what was omitted, and to transmit all to his own executors. The confirmation of a stranger, who is executor nominated, as it is merely a trust for the next of kin, has the effect to establish the right of the next of kin to the subjects confirmed, in the same manner as if himself had confirmed them.

18. Executry, though it carries a certain degree of representation of the deceased, is properly an office: executors therefore are not subjected to the debts due by the deceased, beyond the value of the inventory; but, at the same time, they are liable in diligence for making the inventory effectual to all having interest. An executor-creditor who confirms more than his debt amounts to, is liable in diligence for what he confirms. Executors are not liable in interest, even upon such bonds recovered by them as carried interest to the deceased, because their office obliges them to retain the sums they have made effectual, in order to a distribution thereof among all having interest. This holds though they should again lend out the money upon interest, as they do it at their own risk.

19. There are certain debts of the deceased called privileged debts, which were always preferable to every other. Under that name are comprehended, medicines furnished to the deceased on death-bed, physicians fees during that period, funeral charges, and the rent of his house, and his servants wages for the year or term current at his death. These the executors are in safety to pay on demand. All the other creditors, who either obtain themselves confirmed, or who cite the executor already confirmed, within six months after their debtor's death, are preferred, *pari passu*, with those who have done more timely diligence; and therefore no executor can either retain for his own debt, or pay a testamentary debt, so as to exclude any creditor, who shall use diligence within the six months, from the benefit of the *pari passu* preference; neither can a decree for payment of debt be obtained, in that period, against an executor, because, till that term be elapsed, it cannot be known how many creditors may be intitled to the fund in his hands. If no diligence be used within the six months, the executor may retain for his own debt, and pay the residue *primo venienti*. Such creditors of the deceased as have used diligence within a year after their debtor's death, are preferable on the subject of his testament to the creditors of his next of kin.

20. The only passive title in moveables is vitious intromission,

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Vituous in-  
tromission.

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tromission; which may be defined, an unwarrantable intermeddling with the moveable estate of a person deceased, without the order of law. This is not confined, as the passive titles in heritage are, to the persons interested in the succession, but strikes against all intrumitters whatever. Where an executor confirmed, intrumits with more than he has confirmed, he incurs a passive title; fraud being in the common case presumed from his not giving up in inventory the full subject intermeddled with. Vituous intromission is also presumed, where the repositories of a dying person are not sealed up, as soon as he becomes incapable of sense, by his nearest relations; or, if he dies in a house not his own, they must be sealed by the master of such house, and the keys delivered to the judge-ordinary, to be kept by him, for the benefit of all having interest.

21. The passive title of vituous intromission does not take place where there is any probable title or circumstance that takes off the presumption of fraud. In consequence of this rule, necessary intromission, or *custodia causa*, by the wife or children, who only continue the possession of the deceased, in order to preserve his goods for the benefit of all concerned, infers no passive title. And, upon the same principle, an intrumitter, by confirming himself executor, and thereby subjecting himself to account, before action be brought against him on the passive titles, purges the vitiosity of his prior intromission: and where the intrumitter is one who is interested in the succession, *e. g.* next of kin, his confirmation, at any time within a year from the death of the deceased, will exclude the passive title, notwithstanding a prior citation. As this passive title is intended only for the security of creditors, it cannot be sued upon by legatees; and since it arises *ex delicto*, it cannot be pleaded against the heir of the intrumitter. As in delicts, any one of many delinquents may be subjected to the whole punishment, so any one of many intrumitters may be sued in *solidum* for the pursuer's debt, without calling the rest; but the intrumitter who pays, has an action of relief against the others for their share of it. If the intrumitters are sued jointly, they are liable, not *pro rata* of their several intrumissions, but *pro virili*.

28. The whole of a debtors estate is subjected to the payment of his debts; and therefore, both his heirs and executors are liable for them, in a question with creditors: but as succession is by law divided into the heritable and the moveable estate, each of these ought, in a question between the several successors, to bear the burdens which naturally affect it. Action of relief is accordingly competent to the heir who has paid a moveable debt, against the executor; and *vice versa*. This relief is not cut off by the deceased's having disposed either his land-estate or his moveables, with the burden of his whole debts; for such burden is not to be construed as an alteration of the legal succession, but merely as a farther security to creditors, unless the contrary shall be presumed from the special style of the disposition.

#### IV. OF LAST HEIRS AND BASTARDS.

elxxiii.

Where there is no heir, the king succeeds.

By our ancient practice, feudal grants taken to the vassal, and to a special order of heirs, without settling the last termination upon *heirs whatsoever*, returned to

the superior, upon failure of the special heirs therein contained; but now that feus are become patrimonial rights, the superior is, by the general opinion, held to be fully divested by such grant, and the right descends to the vassal's heirs at law. And even where a vassal dies without leaving any heir who can prove the remotest propinquity to him, it is not the superior, as the old law stood, but the king, who succeeds as last heir, both in the heritable and moveable estate of the deceased, in consequence of the rule, *Quod nullius est, cedit domino Regi*.

2. If the lands, to which the king succeeds, be holden immediately of himself, the property is consolidated with the superiority, as if resignation had been made in the sovereign's hands. If they are holden of a subject, the king, who cannot be vassal to his own subject, names a donatory; who, to complete his title, must obtain a decree of declarator; and thereafter he is presented to the superior, by letters of presentation from the king under the quarter-seal, in which the superior is charged to enter the donatory. The whole estate of the deceased is, in this case, subjected to his debts, and to the widow's legal provisions. Neither the king nor his donatory is liable beyond the value of the succession. A person who has no heir to succeed to him, cannot alien his heritage *in lesio*, to the prejudice of the king, who is intitled to set aside such deed, in the character of *ultimus heres*.

3. A bastard can have no legal heirs, except those of his own body; since there is no succession but by the father, and a bastard has no certain father. The king therefore succeeds to him, failing his lawful issue, as last heir. Though the bastard, as absolute proprietor of his own estate, can dispose of his heritage in *liege poultie*, and of his moveables by any deed *inter vivos*; yet he is disabled, *ex defectu natalium*, from bequeathing by testament, without letters of legitimation from the sovereign. If the bastard has lawful children, he may test, without such letters, and name tutors and curators to his issue. Letters of legitimation, let their clauses be ever so strong, cannot enable the bastard to succeed to his natural father, to the exclusion of lawful heirs.

4. The legal rights of succession, being founded in marriage, can be claimed only by those who are born in lawful marriage; the issue therefore of an unlawful marriage are incapable of succession. A bastard is excluded, (1.) From his father's succession; because law knows no father who is not marked out by marriage. (2.) From all heritable succession, whether by the father or mother; because he cannot be pronounced lawful heir by the inquest, in terms of the brief. And, (3.) From the moveable succession of his mother; for, though the mother be known, the bastard is not her lawful child, and legitimacy is implied in all succession conferred by law. A bastard, though he cannot succeed *jure sanguinis*, may succeed by destination, where he is specially called to the succession by an entail or testament.

5. Certain persons, though born in lawful marriage, are incapable of succession. Aliens are, from their allegiance to a foreign prince, incapable of succeeding in feudal rights, without naturalization. Children born in a foreign state, whose fathers were natural born subjects, and not attainted, are held to be natural born subjects.

Bastards incapable of legal, but not of attainted, succession.

Aliens incapable of succeeding in feudal rights;



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subjects. Persons educated in, or professing, the Popish religion, if they shall neglect, upon their attaining the age of fifteen, to renounce its doctrines by a signed declaration, cannot succeed in *heritage*; but must give place to the next Protestant heir, who will hold the estate irredeemably, if the Popish heir does not, within ten years after incurring the irritancy, sign the *formula* prescribed by the statute 1700, c. 3.

### CHAP. III.

#### OF ACTIONS.

**H**ITHERTO of *Persons and Rights*, the two first objects of law: *Actions* are its third object, whereby persons make their rights effectual.

#### SECT. I. Nature, division, &c. of Actions.

An action may be defined, A demand regularly made and insisted in, before the judge competent, for the attaining or recovering of a right; and it suffers several divisions, according to the different natures of the rights pursued upon.

2. Actions are either real or personal. A real action is that which arises from a right in the thing itself, and which therefore may be directed against all possessors of that thing: thus, an action for the recovery, even of a moveable subject, when founded on a *ius in re*, is in the proper acceptation real; but real actions are, in vulgar speech, confined to such as are directed against heritable subjects. A personal action is founded only on an obligation undertaken for the performance of some fact, or the delivery of some subject; and therefore can be carried on against no other than the person obliged, or his heirs.

3. Actions, again, are either ordinary or rescissory. All actions are, in the sense of this division, ordinary, which are not rescissory. Rescissory actions are divided, (1.) Into actions of proper improbation. (2.) Actions of reduction improbation. (3.) Actions of simple reduction. Proper improbations, which are brought for declaring writings false or forged, are noticed below, N<sup>o</sup> clxxxvi. 32. Reduction-improbation is an action, whereby a person who may be hurt or affected by a writing, insists for producing or exhibiting it in court, in order to have it set aside, or its effect ascertained, under the certification that the writing, if not produced, shall be declared false and forged. This certification is a fiction of law, introduced that the production of writings may be the more effectually forced, and therefore it operates only in favour of the pursuer. Because the summons in this action proceeds on alleged grounds of falsehood, his majesty's advocate, who is the public prosecutor of crimes, must concur in it.

4. As the certification in this process draws after it so heavy consequences, two terms are assigned to the defenders for production. After the second term is elapsed, intimation must be made judicially to the defender, to satisfy the production within ten days; and till these are expired, no certification can be pronounced. Certification cannot pass against deeds recorded in the books of session, if the defender shall, before the second term, offer a condescence of the dates of their registration, unless falsehood be objected: in which case, the original must be brought from the record to

the court. But an extract from the inferior court is no bar to certification; the principal writing must be laid before the court of session on a proper warrant.

5. In an action of simple reduction the certification is only temporary, declaring the writings called for, null, until they be produced; so that they recover their full force after production, even against the pursuer himself; for which reason, that process is now seldom used. Because its certification is not so severe as in reduction-improbation, there is but one term assigned to the defender for producing the deeds called for.

6. The most usual grounds of reduction of writings are, the want of the requisite solemnities; that the granter was minor, or interdicted, or inhibited; or that he signed the deed on death-bed, or was compelled or frightened into it, or was circumvented; or that he granted it in prejudice of his lawful creditors.

7. In reductions on the head of force, or fear, or fraud and circumvention, the pursuer must libel the particular circumstances from which his allegation is to be proved. Reduction is not competent upon every degree of force or fear; it must be such as would shake a man of constancy and resolution. Neither is it competent, on that fear which arises from the just authority of husbands or parents over their wives or children, nor upon the fear arising from the regular execution of lawful diligence by caption, provided the deeds granted under that fear relate to the ground of debt contained in the diligence; but if they have no relation to that debt, they are reducible *ex metu*.

8. Alienations granted by debtors after contracting of lawful debts, in favour of conjunct or confident persons, without just and necessary causes, and without a just price really paid, are null. One is deemed a prior creditor, whose ground of debt existed before the right granted by the debtor; though the written voucher of the debt should bear a date posterior to it. Persons are accounted conjunct, whose relation to the granter is so near, as to bar them from judging in his cause. Confident persons are those who appear to be in the granter's confidence, by being employed in his affairs, or about his person; as a doer, steward, or domestic servant.

9. Rights, though gratuitous, are not reducible, if the granter had, at the date thereof, a sufficient fund for the payment of his creditors. Provisions to children are, in the judgment of law, gratuitous; so that their effect, in a question with creditors, depends on the solvency of the granter: but settlements to wives, either in marriage-contracts, or even after marriage, are onerous, in so far as they are rational; and consequently are not reducible, even though the granter was insolvent. This rule holds also in rational tochers contracted to husbands: But it must, in all cases, be qualified with this limitation, *if the insolvency of the granter was not publicly known*; for if it was, fraud is presumed in the receiver of the right, by contracting with the bankrupt.

10. The receiver of the deed, if he be a conjunct or confident person, must altrust or support the onerous cause of his right, not merely by his own oath, but by some circumstances or adminicles. But where a right is granted to a stranger, the narrative of it expressing an onerous cause, is sufficient *per se* to secure it against reduction.

Simple reduction.

Grounds of reduction.

Simple reduction.

Simple reduction.

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Law of  
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11. All voluntary payments or rights made by a bankrupt to one creditor, to disappoint the more tedious diligence of another, are reducible at the instance of that creditor who has used the prior diligence. A creditor, though his diligence be but begun by citation, may insist in a reduction of all posterior voluntary rights granted to his prejudice; but the creditor who neglects to complete his begun diligence within a reasonable time, is not intitled to reduce any right granted by the debtor, after the time that the diligence is considered as abandoned.

12. A prohibited alienation, when conveyed by the receiver to another who is not privy to the fraud, subsists in the person of the *bona fide* purchaser. In the case of moveable rights, this nullity is receivable by exception; but it must be declared by reduction, where the right is heritable.

13. By act 1696, c. 5. all alienations by a bankrupt, within sixty days before his bankruptcy, to one creditor in preference to another, are reducible, at the instance even of such co-creditors as had not used the least step of diligence. A bankrupt is there described by the following characters; diligence used against him by horning and caption; and insolvency, joined either with imprisonment, retiring to the sanctuary, absconding, or forcibly defending himself from diligence. It is sufficient that a caption is raised against the debtor, though it be not executed, provided he has retired to slun it. It is provided, that all heritable bonds or rights on which seisin may follow, shall be reckoned, in a question with the grantor's other creditors upon this act, to be of the date of the seisin following thereon. But this act was found to relate only to securities for former debts, and not to *nova debita*.

ACTIONS ci-  
ther rei per-  
secutorie, or  
penal.

14. Actions are divided into *rei persecutorie*, and *penales*. By the first, the pursuer insists barely to recover the subject that is his, or the debt due to him; and this includes the damage sustained; for one is as truly a sufferer in his patrimonial interest by that damage, as by the loss of the subject itself. In penal actions, which always arise *ex delicto*, something is also demanded by way of penalty.

Spuilzie.

15. Actions of spuilzie, ejection, and intrusion, are penal. An action of spuilzie is competent to one dispossessed of a moveable subject violently, or without order of law, against the person dispossessing: not only for being restored to the possession of the subject, if extant, or for the value, if it be destroyed, but also for the violent profits, in case the action be brought within three years from the spoliation. Ejection and intrusion are, in heritable subjects, what spuilzie is in moveables. The difference between the two first is, that in ejection, violence is used; whereas the intruder enters into the void possession, without either a title from the proprietor, or the warrant of a judge. The actions arising from all the three are of the same general nature.

Contraven-  
tion of law  
borrow.

16. The action of contravention of law-borrows is also penal. It proceeds on letters of law-borrows, (from *borgh* a cautioner), which contain a warrant to charge the party complained upon, that he may give security, not to hurt the complainer in his person, family, or estate. These letters do not require the previous citation of the party complained upon, because the caution which the law requires is only for doing

what is every man's duty; but, before the letters are executed against him, the complainer must make oath that he dreads bodily harm from him. The penalty of contravention is ascertained to a special sum, according to the offender's quality; the half to be applied to the fisk, and the half to the complainer. Contravention is not incurred by the uttering of reproachful words, where they are not accompanied, either with acts of violence, or at least a real injury; and as the action is penal, it is elided by any probable ground of excuse.

17. Penalties are the consequences of delict, or transgression; and as no heir ought to be accountable for the delict of his ancestor, farther than the injured person has really suffered by it, penal actions die with the delinquent, and are not transmissible against heirs. Yet the action, if it has been commenced and litigated in the delinquent's lifetime, may be continued against the heir, though the delinquent should die during the dependence. Some actions are *rei persecutorie* on the part of the pursuer, when he insists for simple restitution; which yet may be penal in respect of the defender; *e. g.* the action on the passive title of vitious intromission, by which the pursuer frequently recovers the debt due to him by the deceased, though it should exceed the value of the goods intermeddled with by the defenders.

18. The most celebrated division of actions in our law is into *petitory*, *possessory*, and *declaratory*. *Petitory* actions are those, where something is demanded from the defender, in consequence of a right of property, or of credit in the pursuer: Thus, actions for restitution of moveables, actions of poiding, of forthcoming, and indeed all personal actions upon contracts or quasi-contracts, are petitory. *Possessory* actions are those which are founded, either upon possession alone, as spuilzies; or upon possession joined with another title, as removings; and they are competent either for getting into possession, for holding it, or for recovering it; analogous to the interdicts, of the Roman law, *quorum bonorum, uti possidetis, and unde vi*.

16. An action of molestation is a possessory action, competent to the proprietor of a land-estate, against those who disturb his possession. It is chiefly used in questions of commonry, or of controverted marches. Where a declarator of property is conjoined with a process of molestation, the seisin alone is competent to the action. Actions on briefs of perambulation, have the same tendency with molestations, *viz.* the settling of marches between conterminous lands.

20. The actions of mails and duties is sometimes of mails petitory, and sometimes possessory. In either case, it is directed against the tenants and natural possessors of land-estates, for payment to the pursuer of the rents remaining due by them for past crops, and of the full rent for the future. It is competent, not only to a proprietor whose right is perfected by seisin, but to a simple disponee, for a disposition of lands includes a right to the mails and duties; and consequently to an adjudger, for an adjudication is a judicial disposition. In the petitory action, the pursuer, since he founds upon right, not possession, must make the proprietor, from whom the tenants derive their right, party to the suit; and he must support his claim by titles of property or diligences, preferable to those in the person of

Penal ac-  
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Petitory.

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Poffeffory.

Poffeffory  
Judgment.Declar-  
atory action.Action for  
proving the  
deed.Adminicles  
writing.

of his competitor. In the poffeffory, the purfuer who libels that he, his anceftors or authors, have been feven years in poffeffion, and that therefore he has the benefit of a poffeffory judgment, need produce no other title than a feifin, which is a title fufficient to make the poffeffion of heritage lawful; and it is enough, if he calls the natural poffeffors, though he fhould neglect the proprietor. A poffeffory judgment founded on feven years poffeffion, in confequence either of a feifin or a tack, has this effect, that though one fhould claim under a title preferable to that of the poffeffor, he cannot compete with him in the poffeffion, till in a formal procefs of reduction he fhall obtain the poffeffor's title declared void.

21. A declaratory action is that, in which fome right is craved to be declared in favour of the purfuer, but nothing fought to be paid or performed by the defender, fuch as declarators of marriage, of irritancy, of expiry, of the legal reverfion, &c. Under this clafs may be alfo comprehended refcifory actions, which, without any perfonal conclufion againft the defender, tend fimply to fet afide the rights or writings libelled, in confequence of which a contrary right or immunity arifes to the purfuer. Decrees upon actions that are properly declaratory confer no new right; they only declare what was the purfuer's right before, and fo have a retrofpect to the period at which that right firft commenced. Declarators, becaufe they have no perfonal conclufion againft the defender, may be purfued againft an apparent heir without a previous charge given him to enter to his anceftor; unlefs where fpecial circumftances require a charge.

22. An action for proving the tenor, whereby a writing, which is destroyed or amiffing, is endeavoured to be revived, is in effect declaratory. In obligations that are extinguiſhable barely by the debtor's retiring or cancelling them, the purfuer, before a proof of the tenor is admitted, muſt confedeſc on ſuch a *caſus amiſſionis*, or accident by which the writing was destroyed, as ſhews it was loſt when in the creditor's poffeffion; otherwife bonds that have been cancelled by the debtor on payment, might be reared up as ſtill ſubſiſting againſt him: But in writings which require contrary deeds to extinguiſh their effect, as aſſignations, diſpoſitions, charters, &c. it is ſufficient to libel that they were loſt, even *caſu fortuito*.

23. Regularly, no deed can be revived by this action, without ſome adminicle in writing, referring to that which is libelled; for no written obligation ought to be raiſed up barely on the teſtimony of witneſſes. If theſe adminicles afford ſufficient conviction that the deed libelled did once exiſt, the tenor is admitted to be proved by witneſſes, who muſt depole, either that they were preſent at ſigning the deed, or that they afterwards ſaw it duly ſubſcribed. Where the relative writings contain all the ſubſtantial clauſes of that which is loſt, the tenor is ſometimes ſuſtained without witneſſes. In a writing which is libelled to have contained uncommon clauſes, all theſe muſt appear by the adminicles. Actions of proving the tenor are, on account of their importance, appropriated to the court of Seſſion; and, by the old form, the teſtimony of the witneſſes could not be received but in preſence of all the judges.

24. The action of double or multiple poiding may

be alſo reckoned declaratory. It is competent to a debtor, who is diſtreſſed, or threatened with diſtreſſes, by two or more perſons claiming right to the debt, and who therefore brings the ſeveral claimants into the field, in order to debate and ſettle their ſeveral preferences, that ſo he may pay ſecurely to him whoſe right ſhall be found preferable. This action is daily purſued by an arreſtee, in the caſe of ſeveral arreſtments uſed in his hands for the ſame debt; or by tenants in the caſe of ſeveral adjudgers, all of whom claim right to the ſame rents. In theſe competitions, any of the competitors may bring an action of multiple-poiding in name of the tenants, or other debtors, without their conſent, or even though they ſhould diſclaim the proceſs; ſince the law has introduced it as the proper remedy for getting ſuch competitions determined: And while the ſubject in controverſy continues *in medio*, any third perſon who conceives he has a right to it, may, though he ſhould not be cited as a defender, produce his titles, as if he were an original party to the ſuit, and will be admitted for his intereſt in the competition.

25. Certain actions may be called *acceſſory*, becauſe they are merely preparatory or ſubſervient to other actions. Thus, exhibitions *ad deliberandum*, at the inſtance of an heir againſt the creditors or cuſtodians of his anceſtor's writings, are intended only to pave the way for future proceſſes. An action of tranſference is alſo of this ſort, whereby an action, during the pendency of which the defender happens to die, is craved to be transferred againſt his repreſentative, in the ſame condition in which it ſtood formerly. Upon the purfuer's death his heir may inſiſt in the cauſe againſt the defender, upon producing, either a retour or a confirmed teſtament, according as the ſubject is heritable or moveable. Tranſferences being but incidental to other actions, can be pronounced by that inferior judge alone before whom the principal cauſe depended; but, where the repreſentatives of the deceased live in another territory, it is the ſupreme court muſt transfer. Obligations may now be regiſtered ſummarily after the creditor's death; which before was not admitted, without a ſeparate proceſs of regiſtration, to which the granter was neceſſarily to be made a party.

26. A proceſs of wakening is likewiſe acceſſory. An action is ſaid to ſleep, when it lies over not inſiſted in for a year, in which caſe its effect is ſuſpended; but even then it may, at any time within the years of preſcription, be revived or wakened by a ſummons, in which the purfuer recites the laſt ſtep of the proceſs, and concludes that it may be again carried on as if it had not been diſcontinued. An action that ſtands upon any of the inner-houſe rolls cannot ſleep; nor an action in which decree is pronounced, becauſe it has got its full completion: Conſequently the decree may be extracted after the year, without the neceſſity of a wakening.

27. An action of tranſumpt falls under the ſame clafs. It is competent to thoſe who have a partial intereſt in writings that are not in their own cuſtody, againſt the poſſeſſors thereof, for exhibiting them, that they may be tranſumed for their behoof. Though the ordinary title in theſe proceſſes be an obligation by the defender to grant tranſumps to the purfuer, it is ſufficient if the purfuer can ſhow that he has an intereſt in the writings; but in this caſe, he muſt tranſume them on his

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Scotland.Multiple-  
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Wakening.

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on his own charges. Actions of transumpit may be pursued before any judge-ordinary. After the writings to be transumped are exhibited, full duplicates are made out, collated, and signed, by one of the clerks of court, which are called *transumps*, and are as effectual as an extract from the register.

Brieves.

28. Actions proceeded anciently upon brieves issuing from the chancery, directed to the judiciary or judge-ordinary, who tried the matter by a jury, upon whose verdict judgment was pronounced: And to this day, we retain certain brieves, as of *inquest*, *terce*, *idiotry*, *tutory*, *perambulation*, and perhaps two or three others: But summonses were, immediately upon the institution of the College of Justice, introduced in the place of brieves. A summons, when applied to actions pursued before the session, is a writ in the King's name, issuing from his signet upon the pursuer's complaint, authorizing messengers to cite the defender to appear before the court and make his defences; with certification if he fail to appear, that decree will be pronounced against him in terms of the certification of the summonses.

Summonses

29. The days indulged by law to a defender, between his citation and appearance, to prepare for his defence, are called *inducia legales*: If he is within the kingdom, 21 and 6 days, for the first and second diets of appearance, must be allowed him for that purpose; and if out of it, 60 and 15. Defenders residing in Orkney or Zetland must be cited on 40 days. In certain summonses which are privileged, the *inducia* are shortened: Spuilzies and ejections proceed on 15 days; wakenings and transferences, being but incidental, on six; see the list of privileged summonses, in act of sederunt June 29. 1672. A summons must be executed, *i. e.* served against the defender, so as the last diet of appearance may be within a year after the date of the summons; and it must be called within a year after that diet, otherwise it falls for ever. Offence against the authority of the court, acts of malversation in office by any member of the college of justice, and acts of violence and oppression committed during the dependence of a suit by any of the parties, may be tried without a summons, by a summary complaint.

Judicia le-  
gales.

30. Where an action is in part penal, *e. g.* a removing, spuilzie, &c. a pursuer who restricts his demand to, and obtains a decree merely for, restitution, cannot thereafter bring a new process for the violent profits. Yet the same fact may be the foundation both of a criminal and civil action, because these two are intended for different purposes; the one for satisfying the public justice, the other for indemnifying the private party: And though the defender should be absolved in the criminal trial, for want of evidence, the party injured may bring an action *ad civilem effectum*, in which he is intitled to refer the libel to the defender's oath.

Concourse  
of actions.

31. One libel or summons may contain different conclusions on the same ground of right, rescissory, declaratory, petitory, &c. if they be not repugnant to each other: Nay, though different sums be due to one, upon distinct grounds of debt, or even by different debtors, the creditor may insist against them all in the same summonses.

Accumula-  
tion of ac-  
tions

32. Defences are pleas offered by a defender for eluding an action. They are either dilatory, which do

not enter into the cause itself, and so can only procure an absolution from the *lis pendens*: Or peremptory, which entirely cut off the pursuer's right of action. The first, because they relate to the forms of proceeding, must be offered *in limine judicii*, and all of them at once. But peremptory defences may be proposed at any time before sentence.

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Scotland.

33. A cause, after the parties had litigated it before the judge, was said by the Romans to be *litiscontestata*. By *litiscontestata* a judicial contract is understood to be entered into by the litigants, by which the action is perpetuated against heirs, even when it arises *ex delicto*. By our laws, *litiscontestata* is not formed till an act is extracted, admitting the libel or defences to proof.

Litiscor-  
tation.

## SECT. II. Of Probation.

clxxxi.

ALL allegations by parties to a suit, must be supported by proper proof. Probation is either by writing, by the party's own oath, or by witnesses. In the case of allegations, which may be proved by either of the three ways, a proof is said to be admitted *prout de prout de jure*; because, in such case, all the legal methods of probation are competent to the party: if the proof he brings by writing be lame, he may have recourse either to witnesses or to his adversary's oath; but, if he should first take himself to the proof by oath, he cannot thereafter use any other probation, for the reason assigned par. 3. and, on the contrary, a pursuer, who has brought a proof by witnesses, on an extracted act, is not allowed to recur to the oath of the defender. Single combat, as a sort of appeal to Providence, was, by our ancient law, admitted as evidence, in matters both civil and criminal. It was afterwards restricted to the case of such capital crimes where no other proof could be had; some traces of this blind method of trial remained even in the reign of James VI. who, by 1600, c. 12. might authorize duels on weighty occasions.

Probatio

by single  
combat.

2. As obligations or deeds signed by the party himself, or his ancestors or authors, must be, of all evidence, the least liable to exception; therefore every debt or allegation may be proved by proper evidence in writing. The solemnities essential to probative deeds have been already explained, No clxxiv. 3. *et seq.* Books of account kept by merchants, tradesmen, and other dealers in business, though not subscribed, are probative against him who keeps them; and, in case of furnishings by a shop-keeper, such books, if they are regularly kept by him, supported by the testimony of a single witness, afford a *semiplena probatio* in his favour, which becomes full evidence by his own oath in supplement. Notarial instruments and executions by messengers bear full evidence, that the solemnities therein set forth were used, not to be invalidated otherwise than by a proof of falsehood; but they do not prove any other extrinsic facts therein averred, against third parties.

3. Regularly, no person's right can be proved by his own oath, nor taken away by that of his adversary; because these are the bare averments of parties in their own favour. But, where the matter in issue is referred by one of the parties to the oath of the other, such oath, though made in favour of the deponent himself, is decisive of the point; because the reference is a virtual contract between the litigants, by which they are understood to put the issue of the cause upon what shall

Probatio  
oath of  
party in re-  
ference.

be

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Scotland.

be depofed: and this contract is fo ftrictly regarded, that the party who refers to the oath of the other cannot afterwards, in a civil action, plead upon any deed againft the party depofing, inconfiftent with his oath. To obviate the fnares that may be laid for perjury, he, to whole oath of verity a point is referred, may refufe to depofe, till his adverfary fwear that he can bring no other evidence in proof of his allegation.

4. A defender, though he cannot be compelled to fwear to facts in a libel properly criminal; yet may, in trefpaffes, where the conclufion is limited to a fine, or to damages. In general, an oath of party cannot either hurt or benefit third parties; being, as to them, *res inter alios acta*.

qualified  
oaths.

5. An oath upon reference, is fometimes qualified by fpecial limitations reftricting it. The qualities which are admitted by the judge as part of the oath, are called *intrinsic*; thofe which the judge rejects or feparates from the oath, *extrinsic*. Where the quality makes a part of the allegation which is relevantly referred to oath, it is *intrinsic*. Thus, becaufe a merchant, fuing for furnifhings after the three years, muft, in order to make a relevancy, offer to prove by the defender's oath, not only the delivery of the goods, but that the price is ftill due; therefore, though the defender fhould acknowledge upon oath his having received the goods, yet, if he adds, that he paid the price, this laft part, being a denial that the debt fubfifts, is *intrinsic*, fince it is truly the point referred to oath. Where the quality does not import an extinction of the debt, but barely a counter-claim, or *mutua petitio*, againft the purfuer, it is held as *extrinsic*, and muft be proved *aliunde*. Neither can a defender who in his oath admits the conflitution of a debt, get off by adjecting the quality of payment, where the payment ought by its nature to be vouched by written evidence.

oaths in  
fupplement

6. Oaths of verity are fometimes deferred by the judge to either party, *ex officio*; which becaufe they are not founded on any implied contract between the litigants, are not finally decifive, but may be traversed on proper evidence afterwards produced. Thefe oaths are commonly put by the judge for fupplying a lame or imperfect proof, and are therefore called oaths in fupplement. See par. 2.

oath of  
calumny.

7. To prevent groundlefs allegations, oaths of calumny have been introduced, by which either party may demand his adverfary's oath, that he believes the fact contained in his libel or defences to be juft and true. As this is an oath, not of verity, but only of opinion, the party who puts it to his adverfary does not renounce other probation; and therefore no party is bound to give an oath of calumny, on recent facts of his own, for fuch oath is really an oath of verity. Thefe oaths have not been fo frequent fince the act of feditious, Feb. 1. 1715, whereby any party, againft whom a fact fhall be alleged, is obliged, without making oath, to confefs or deny it; and, in cafe of calumnious denial, is fubjected to the expence that the other party has thereby incurred.

8. In all oaths, whether of verity or calumny, the citation carries, or at leaft implies, a certification, that if the party does not appear at the day affigned for depofing, he fhall be held *pro confeffo*; from a prefumption of his confcioufnefs, that the fact upon which he declines to fwear makes againft him; but no party can

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Scotland.A non me-  
mini oath.Oath is in-  
tem.

be held *pro confeffo*, if he be in the kingdom, without a previous perfonal citation ufed againft him. Though an oath which refolves into a *non memini*, cannot be faid to prove any point; yet where one fo depofes upon a recent fact, to which he himfelf was privy, his oath is confidered as a diffembling of the truth, and he is held *pro confeffo*, as if he had refufed to fwear.

9. An oath *in litem*, is that which the judge defers to a purfuer, for afcertaining either the quantity or the value of goods which have been taken from him by the defender without order of law, or the extent of his damages. An oath *in litem*, as it is the affirmation of a party in his own behalf, is only allowed where there is proof that the other party has been engaged in fome illegal act, or where the public policy has made it neceffary, (fee No clxxiii. 11.) This oath, as to the quantities, is not admitted, where there is a concurring testimony of witneffes brought in proof of it. When it is put as to the value of goods, it is only an oath of credulity; and therefore it has always been fubject to the modification of the court.

Probation by  
witneffes, in  
what cafes  
rejected.

10. The law of Scotland rejects the testimony of witneffes, (1.) In payment of any fum above *L. 100 Scots*, all which muft be proved either *cripto vel juramento*. (2.) In all gratuitous promifes, though for the fmalleft trifle. (3.) In all contracts, where writing is either effential to their conflitution, (fee No clxiv. 2.) or where it is ufually adhibited, as in the borrowing of money. And it is a general rule, fubject to the reftrictions mentioned in the next par. that no debt or right, once conflituted by writing, can be taken away by witneffes.

in what ad-  
mitted.

11. On the other part, probation by witneffes is admitted to the extent of *L. 100 Scots*, in payments, nuncupative legacies, and verbal agreements which contain mutual obligations. And it is received to the higheft extent, (1.) In all bargains which have known engagements naturally arifing from them, concerning moveable goods. (2.) In facts performed in fatisfaction, even of a written obligation, where fuch obligation binds the party precifely to the performance of them. (3.) In facts which with difficulty admit of a proof by writing, even though the effect of fuch proof fhould be the extinction of a written obligation, efpecially if the facts import fraud or violence; thus, a bond is reducible *ex dolis*, on a proof by witneffes. Laftly, all intromiffion by a creditor with the rents of his debtor's eftate payable in grain, may be proved by witneffes; and even intromiffion with the filver-rent, where the creditor has entered into the total poffeffion of the debtor's lands.

What per-  
fons rejec-  
ted as wit-  
neffes.

12. No perfon, whole near relation to another bars him from being a judge in his caufe, can be admitted as a witnefs for him; but he may, againft him, except a wife or child, who cannot be compelled to give testimony againft the husband or parent, *ob reverentiam perfona, et metum perjurii*. Though the witnefs, whole propinquity to one of the parties is objected to, be as nearly related to the other, the objection ftands good.

13. The testimony of infamous perfons is rejected, *i. e.* perfons who have been guilty of crimes that law declares to infer infamy, or who have been declared infamous by the fentence of a judge; but *infamia facti* does not difqualify a witnefs. Pupils are inhabile wit-

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Scotland.

nesses; being, in the judgment of law, incapable of the impressions of an oath. The testimony of women is seldom admitted, where other witnesses can be had. And in general witnesses otherwise exceptionable may, where there is a penalty of witnesses arising from the nature or circumstances of the fact, be received *cum nota*; that is, their testimony, though not quite free from suspicion, is to be conjoined with the other evidence, and to have such weight given it as the judge shall think it deserves.

Purgation  
of witnesses.

14. All witnesses, before they are examined in the cause, are purged of partial counsel; that is, they must declare, that they have no interest in the suit, nor have given advice how to conduct it; that they have got neither bribe nor promise, nor have been instructed how to depose; and that they bear no enmity to either of the parties. These, because they are the points put to a witness before his making oath, are called *initialia testimonii*. Where a party can bring present proof of a witness's partial counsel, in any of the above particulars, he ought to offer it before the witness be sworn; but, because such objection, if it cannot be instantly verified, will be no bar to the examination, law allows the party in that case to protest for *reprobator*, before the witness is examined; i. e. that he may be afterwards allowed to bring evidence of his enmity, or other inability. Reprobator is competent even after sentence, where protestation is duly entered; but in that case, the party insisting must consign *L. 100 Scots*, which he forfeits if he succumb. This action must have the concurrence of the king's advocate, because the conclusion of it imports perjury; and for this reason, the witness must be made a party to it.

Diligence  
against wit-  
nesses.

15. The interlocutory sentence or warrant, by which parties are authorized to bring their proof, is either by way of act, or of incident diligence. In an act, the Lord Ordinary who pronounces it, is no longer judge in the process; but in an incident diligence, which is commonly granted upon special points, that do not exhaust the cause, the Lord Ordinary continues judge. If a witness does not appear at the day fixed by the warrant of citation, a second warrant is granted of the nature of a caption, containing a command to messengers to apprehend and bring him before the court. Where the party to whom a proof is granted, brings none within the term allowed by the warrant, an interlocutor is pronounced, circumventing the term, and precluding him from bringing evidence thereafter. Where evidence is brought, if it be upon an act, the Lord Ordinary on the acts, after the term for proving is elapsed, declares the proof concluded; and thereupon a state of the case is prepared by the Ordinary on concluded causes, which must be judged by the whole Lords; but if the proof be taken upon an incident diligence, the import of it may be determined by the Lord Ordinary in the cause.

Circum-  
duction.Presump-  
tions.

16. Where facts do not admit a direct proof, presumptions are received as evidence, which, in many cases, make as convincing a proof as the direct. Presumptions are consequences deduced from facts known or proved, which infer the certainty, or at least a strong probability, of another fact to be proved. This kind of probation is therefore called *artificial*, because it requires a reasoning to infer the truth of the point in question, from the facts that already appear in proof. Presump-

tions are either, 1. *juris et de jure*; 2. *juris*; or, 3. *hominis* or *judicii*. The first sort obtains, where statute or custom establishes the truth of any point upon a presumption; and it is so strong, that it rejects all proof that may be brought to elide it in special cases. Thus, the testimony of a witness, who forwardly offers himself without being cited, is, from a presumption of his partiality, rejected, let his character be ever so fair; and thus also, a minor, because he is by law presumed incapable of conducting his own affairs, is, upon that presumption, disabled from acting without the consent of his curators, though he should be known to behave with the greatest prudence. Many such presumptions are fixed by statute.

17. *Presumptiones juris* are those, which our law-books or decisions have established, without founding any particular consequence upon them, or statuting *super presumpso*. Most of this kind are not proper presumptions inferred from positive facts, but are founded merely on the want of a contrary proof; thus, the legal presumptions for freedom, for life, for innocence, &c. are in effect so many negative propositions, that servitude, death, and guilt, are not to be presumed, without evidence brought by him who makes the allegation. All of them, whether they be of this sort, or proper presumptions, as they are only conjectures formed from what commonly happens, may be elided, not only by direct evidence, but by other conjectures, affording a stronger degree of probability to the contrary. *Presumptiones hominis* or *judicii*, are those which arise daily from the circumstances of particular cases; the strength of which is to be weighed by the judge.

18. A *factis juris* differs from a presumption. Things are presumed, which are likely to be true; but a fiction of law assumes for truth what is either certainly false, or at least is as probably false as true. Thus an heir is feigned or considered in law as the same person with his ancestor. Fictions of law must, in their effects, be always limited to the special purposes of equity for which they were introduced; see an example, *N<sup>o</sup> clxxxiii. 3.*

## SECT. III. Of Sentences and their Executions.

elxxv

PROPERTY would be most uncertain, if debateable points might, after receiving a definitive judgment, be brought again in question, at the pleasure of either of the parties: every state has therefore fixed the character of final to certain sentences or decrees, which in the Roman law are called *res judicate*, and which exclude all review or rehearing.

Res judi-  
cata.

2. Decrees of the court of session, are either *in foro contradictorio*, where both parties have litigated the cause, or in absence of the defender. Decrees of the session *in foro* cannot, in the general case, be again brought under the review of the court, either on points which the parties neglected to plead before sentence (which we call *competent* and *omitted*), or upon points pleaded and found insufficient (proposed and repelled.) But decrees, though *in foro*, are reversible by the court, where either they labour under essential nullities; e. g. where they are *ultra petita*, or not conformable to their grounds and warrants, or founded on an error in calcul, &c.; or where the party against whom the decree is obtained has thereafter recovered evidence

Decree  
in foro.



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Scotland.

two con-  
fession  
locutors  
final.

one limi-  
t for ap-  
peals.

decrees in  
suspension.

decrees re-  
viewed ei-  
ther by re-  
duction or  
suspension.

suspensors  
must give  
caution.

evidence sufficient to overturn it, of which he knew not before.

3. As parties might formerly reclaim against the sentences of the session, at any time before extracting the decree, no judgment was final till extract; but now, a sentence of the inner-house, either not reclaimed against within six federut days after its date, or adhered to upon a reclaiming bill, though it cannot receive execution till extract, makes the judgment final as to the court of session. And, by an order of the house of Lords, March 24. 1725, no appeal is to be received by them from sentences of the session, after five years from extracting the sentence; unless the person entitled to such appeal be minor, clothed with a husband, *non compos mentis*, imprisoned, or out of the kingdom. Sentences pronounced by the Lord Ordinary have the same effect, if not reclaimed against, as if they were pronounced in presence; and all petitions against the interlocutor of an Ordinary must be preferred within eight federut days after signing such interlocutor.

4. Decrees, in absence of the defender, have not the force of *res judicate* as to him; for where the defender does not appear, he cannot be said to have subjected himself by the judicial contract which is implied in liti-contestation: a party therefore may be restored against these, upon paying to the other his costs in recovering them. The sentences of inferior courts may be reviewed by the court of session,—before decree, by advocacy,—and after decree, by suspension or reduction; which two last are also the methods of calling in question such decrees of the session itself, as can again be brought under the review of the court.

5. Reduction is the proper remedy, either where the decree has already received full execution by payment, or where it decrees nothing to be paid or performed, but simply declares a right in favour of the pursuer. Suspension is that form of law by which the effect of a sentence condemnatory, that has not yet received execution, is stayed or postponed till the cause be again considered. The first step towards suspension is a bill preferred to the Lord Ordinary on the bills. This bill, when the desire of it is granted, is a warrant for issuing letters of suspension which pass the signet; but, if the presenter of the bill shall not, within 14 days after passing it, expedite the letters, execution may proceed on the sentence. Suspensions of decrees *in foro* cannot pass, but by the whole lords in time of session, and by three in vacation time; but other decrees may be suspended by any one of the judges.

6. As suspension has the effect of staying the execution of the creditor's legal diligence, it cannot, in the general case, pass without caution given by the suspensor to pay the debt, in the event it shall be found due. Where the suspensor cannot, from his low or suspected circumstances, procure unquestionable security, the lords admit jutory caution, *i. e.* such as the suspensor swears is the best he can offer; but the reasons of suspension are, in that case, to be considered with particular accuracy at passing the bill. Decrees in favour of the clergy, of universities, hospitals, or parish-schoolmasters, for their stipends, rents, or salaries, cannot be suspended, but upon production of discharges, or on consignment of the sums charged for.

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Scotland.

Suspension,  
when com-  
petent.

Extraction  
of decrees.

What per-  
sons secured  
against cap-  
tion.

Prisoners  
must be  
closely con-  
fined.

A charger, who thinks himself secure without a cautioner, and wants dispatch, may, where a suspension of his diligence is sought, apply to the court to get the reasons of suspension summarily discussed on the bill.

7. Though he, in whose favour the decree suspended is pronounced, be always called the charger, yet a decree may be suspended before a charge be given on it. Nay, suspension is competent even where there is no decree, for putting a stop to any illegal act whatsoever: thus, a building, or the exercise of a power which one assumes unwarrantably, is a proper subject of suspension. Letters of suspension are considered merely as a prohibitory diligence; so that the suspensor, if he would turn provoker, must bring an action of reduction. If upon discussing the letters of suspension, the reasons shall be sustained, a decree is pronounced, suspending the letters of diligence on which the charge was given *simpliciter*; which is called a *decree of suspension*, and takes off the effect of the decree suspended. If the reasons of suspension be repelled, the court find the letters of diligence orderly proceeded, *i. e.* regularly carried on; and they ordain them to be put to farther execution.

8. Decrees are carried into execution, by diligence, either against the person or against the estate of the debtor. The first step of personal execution is by letters of horning, which pass, by warrant of the court of session, on the decrees of magistrates of boroughs, sheriffs, admirals, and commissaries. If the debtor does not obey the will of the letters of horning within the days of the charge, the charger, after denouncing him rebel, and registering the horning, may apply for letters of caption, which contain a command, not only to messengers, but to magistrates, to apprehend and imprison the debtor. All messengers and magistrates, who refuse their assistance in executing the caption, are liable *subsidiariè* for the debt; and such subsidiary action is supported by the execution of the messenger employed by the creditor, expressing that they were charged to concur, and would not. Letters of caption contain an express warrant to the messenger, in case he cannot get access, to break open all doors and other lock-fast places.

9. Law secures peers, married women, and pupils, against personal execution by caption upon civil debts. No caption can be executed against a debtor within the precincts of the king's palace of Holyroodhouse: but this privilege of sanctuary afforded no security to criminals, as that did which was, by the canon law, conferred on churches and religious houses. Where the personal presence of a debtor, under caption, is necessary in any of our supreme courts, the judges are empowered to grant him a protection, for such time as may be sufficient for his coming and going, not exceeding a month.

10. After a debtor is imprisoned, he ought not to be indulged the benefit of the air, not even under a guard; for creditors have an interest, that their debtors be kept under close confinement, that, by the *squalor carceris*, they may be brought to pay their debt: and any magistrate or jailor, who shall suffer the prisoner to go abroad, without a proper attestation, upon oath, of the dangerous state of his health, is liable *subsidiariè* for the debt. Magistrates are in like manner

Law of Scotland.

Law of Scotland.

Execution against the debtor's estate.

Form of liberating a prisoner.

Liberation upon a *cessio bonorum*.

not competent to delinquents.

Dyvvour's habit.

Aliment.

Act of grace.

Decrees arbitral.

Submissio.

Powers of arbiters.

Decrees arbitral, far reduced.

clxxxv Crime.

public.

liable, if they shall suffer a prisoner to escape, through the insufficiency of their prison : but, if he shall escape under night, by the use of instruments, or by open force, or by any other accident which cannot be imputed to the magistrates or jailor, they are not chargeable with the debt ; provided they shall have, immediately after his escape, made all possible search for him. Regularly, no prisoner for debt upon letters of a caption, though he should have made payment, could be released without letters of suspension, containing a charge to the jailor to set him at liberty ; because the creditor's discharge could not take off the penalty incurred by the debtor for contempt of the king's authority : but to save unnecessary expence to debtors in small debts, jailors are empowered to let go prisoners where the debt does not exceed 200 marks *Scots*, upon production of a discharge, in which the creditor consents to his release.

11. Our law, from a consideration of compassion, allows insolvent debtors to apply for a release from prison, upon a *cessio bonorum*, i. e. upon their making over to the creditors all their estate real and personal. This must be insisted for by way of action, to which all the creditors of the prisoner ought to be made parties. The prisoner must, in this action, which is cognizable only by the court of session, exhibit a particular inventory of his estate, and make oath that he has no other estate than is therein contained, and that he has made no conveyance of any part of it, since his imprisonment, to the hurt of his creditors. He must also make oath, whether he has granted any disposition of his effects before his imprisonment, and condescend on the persons to whom, and on the cause of granting it ; that the court may judge, whether, by any collusive practice, he has forfeited his claim to liberty.

12. A fraudulent bankrupt is not allowed this privilege ; nor a criminal who is liable in any aythment or indemnification to the party injured or his executors, though the crime itself should be extinguished by a pardon. A disposition granted on a *cessio bonorum* is merely in farther security to the creditors, not in satisfaction or *in solutum* of the debts. If, therefore, the debtor shall acquire any estate after his release, such estate may be attached by his creditors, as if there had been no *cessio*, except in so far as is necessary for his subsistence. Debtors, who are set free on a *cessio bonorum*, are obliged to wear a habit proper to dyvours or bankrupts. The lords are prohibited to dispense with this mark of ignominy, unless, in the summons and process of *cessio*, it be libelled, sustained, and proved, that the bankruptcy proceeds from misfortune. And bankrupts are condemned to submit to the habit, even where no suspicion of fraud lies against them, if they have been dealers in an illicit trade.

13. Where a prisoner for debt declares upon oath, before the magistrate of the jurisdiction, that he has not wherewith to maintain himself, the magistrate may set him at liberty, if the creditor, in consequence of whose diligence he was imprisoned, does not aliment him within ten days after intimation made for that purpose. But the magistrate may, in such case, detain him in prison, if he chuses to bear the burden of the aliment rather than release him. The statute authorising this release, which is usually called the *act of grace*, is limited to the case of prisoners for civil debts.

14. Decrees are executed against the moveable estate of the debtor by arrestment or pointing ; and against his heritable estate, by inhibition, or adjudication. If one be condemned, in a removing or other process, to quit the possession of lands, and refuses, notwithstanding a charge, letters of ejection are granted of course, ordaining the sheriff to eject him, and to enter the obtainer of the decree into possession. Where one opposes by violence the execution of a decree, or of any lawful diligence, which the civil magistrate is not able by himself and his officers to make good, the execution is enforced *manu militari*.

15. A decree-arbitral, which is a sentence proceeding on a submissio to arbiters, has some affinity with a judicial sentence, though in most respects the two differ. A submissio is a contract entered into by two or more parties who have disputable rights or claims, whereby they refer their differences to the final determination of an arbiter or arbiters, and oblige themselves to acquiesce in what shall be decided. Where the day within which the arbiters are to decide, is left blank in the submissio, practice has limited the arbiters power of deciding to a year. As this has proceeded from the ordinary words of style, empowering the arbiters to determine betwixt and the day of

next to come ; therefore, where a submissio is indefinite, without specifying any time, like all other contracts or obligations, it subsists for 40 years. Submissions, like mandates, expire by the death of any of the parties-submitters before sentence. As arbiters are not vested with jurisdiction, they cannot compel witnesses to make oath before them, or havers of writings to exhibit them ; but this defect is supplied by the court of session, who, at the suit of the arbiters, or of either of the parties, will grant warrant for citing witnesses, or for the exhibition of writings. For the same reason, the power of arbiters is barely to decide ; the execution of the decree belongs to the judge. Where the submitters consent to the registration of the decree-arbitral, performance may be enforced by summary diligence.

16. The power of arbiters is wholly derived from the consent of parties. Hence where their powers are limited to a certain day, they cannot pronounce sentence after that day. Nor can they subject parties to a penalty higher than that which they have agreed to in the submissio. And where a submissio is limited to special claims, sentence pronounced on subjects not specified in the submissio is null, as being *ultra vires compromissi*.

17. But, on the other part, as submissions are designed for a most favourable purpose, the amicable composing of differences, the powers thereby conferred on arbiters receive an ample interpretation. Decrees-arbitral are not reducible upon any ground, except corruption, bribery, or falsehood.

#### SECT. IV. Of Crimes.

THE word *crime*, in its most general sense, includes every breach, either of the law of God, or of our country ; in a more restricted meaning, it signifies such transgressions of law as are punishable by courts of justice. Crimes were, by the Roman law, divided into public and private. Public crimes were those that were expressly declared such by some law or constitution, and

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ivate.

and which, on account of their more atrocious nature and hurtful consequences, might be prosecuted by any member of the community. Private crimes could be pursued only by the party injured, and were generally punished by a pecuniary fine to be applied to his use. By the law of Scotland, no private party, except the person injured, or his next of his kin, can accule criminally: but the king's advocate, who in this question represents the community, has a right to prosecute all crimes in *vindictam publicam*, though the party injured should refuse to concur. Smaller offences, as petty riots, injuries, &c. which do not demand the public vengeance, pass generally by the appellation of *delicta*, and are punished either by fine or imprisonment.

at essen-  
to  
ces.

2. The essence of a crime is, that there be an intention in the actor to commit it; for an action in which the will of the agent has no part, is not a proper object either of rewards or punishments: hence arises the rule, *crimen dolo contrahitur*. Simple negligence does not therefore constitute a proper crime. Yet where it is extremely gross, it may be punished arbitrarily. Far less can we reckon in the number of crimes, those committed by an idiot or furious person: but lesser degrees of fatuity, which only darken reason, will not afford a total defence, though they may save from the *pœna ordinaria*. Actions committed in drunkenness are not to be considered as involuntary, seeing the drunkenness itself, which was the first cause of the action, is both voluntary and criminal.

3. On the same principle, such as are in a state of infancy, or in the confines of it, are incapable of a criminal action, dole not being incident to that age; but the precise age at which a person becomes capable of dolo, being fixed neither by nature nor by statute, is by our practice to be gathered by the judge, as he best can, from the understanding and manners of the person accused. Where the guilt of a crime arises chiefly from statute, the actor, if he is under puberty, can hardly be found guilty; but, where nature itself points out its deformity, he may, if he is *proximus pubertati*, be more easily presumed capable of committing it; yet, even in that case, he will not be punished *pœna ordinaria*.

cessio-  
n, or art  
part.

4. One may be guilty of a crime, not only by perpetrating it himself, but being accessory to a crime committed by another; which last is by civilians styled *ope et consilio*, and, in our law-phrase, *art and part*. A person may be guilty, art and part, either by giving advice or counsel to commit the crime; or, 2. By giving warrant or mandate to commit it; or, 3. By actually assisting the criminal in the execution. It is generally agreed by doctors, that, in the more atrocious crimes, the adviser is equally punishable with the criminal, and that, in the slighter, the circumstances arising from the adviser's lesser age, the jocular or careless manner of giving advice, &c. may be received as pleas for softening the punishment. One who gives mandate to commit a crime, as he is the first spring of action, seems more guilty than the person employed as the instrument in executing it; yet the actor cannot excuse himself under the pretence of orders which he ought not to have obeyed.

5. Assistance may be given to the committer of a crime, not only in the actual execution, but previous to it, by furnishing him, intentionally, with poison,

arms, or the other means of perpetrating it. That sort of assistance which is not given till after the criminal act, and which is commonly called *abetting*, tho' it be of itself criminal, does not infer art and part of the principal crime; as if one should favour the escape of a criminal knowing him to be such, or conceal him from justice.

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Scotland.

6. Those crimes that are, in their consequences, most hurtful to society, are punished capitally, or by death; others escape with a lesser punishment, sometimes fixed by statute, and sometimes arbitrary, *i. e.* left to the discretion of the judge, who may exercise his jurisdiction, either by fine, imprisonment, or a corporal punishment. Where the punishment is left, by law, to the discretion of the judge, he can in no case extend it to death. The single exception of the criminal falls on conviction, in all capital trials, though the sentence should not express it.

Punish-  
ment of  
crimes.

7. Certain crimes are committed more immediately against God himself; others, against the state; and a third kind, against particular persons. The chief crime in the first class, cognisable by temporal courts, is *blasphemy*, under which may be included *atheism*. This crime consists in the denying or vilifying the Deity, by speech or writing. All who curse God or any of the persons of the blessed Trinity, are to suffer death, even for a single act; and those who deny him, if they persist in their denial. The denial of a Providence, or of the authority of the holy Scriptures, is punishable capitally for the third offence.

Blasphemy.

8. No prosecution can now be carried on for witchcraft or conjuration. But all who undertake, from their skill in any occult science, to *tell fortunes*, or *discover stolen goods*, are to suffer imprisonment for a year, stand in the pillory four times in that year, and find surety for their future good behaviour.

9. Some crimes against the state are levelled directly against the supreme power, and strike at the constitution itself: others discover such a contempt of law, as tends to baffle authority, or slacken the reins of government. *Treason, crimen majestatis*, is that crime which is aimed against the majesty of the state; and can be committed only by those who are subjects of that state either by birth or residence. Soon after the union of the two kingdoms in 1707, the laws of treason, then in force in England, were made ours by 7 Ann. c. 21. both with regard to the facts constituting that crime, to the forms of trial, the corruption of blood, and all the penalties and forfeitures consequent on it.

10. It is high treason, by the law of England, to imagine the death of the King, Queen-consort, or of the heir apparent of the crown; to levy war against the King, or adhere to his enemies; to counterfeit the king's coin, or his great or privy seal; to kill the chancellor, treasurer, or any of the 12 judges of England, while they are doing their offices: which last article is by the forenamed act 7 Ann. applied to Scotland, in the case of slaying any judge of the session or of judiciary sitting in judgment. Those who wash, clip, or lighten the proper money of the realm; who advisedly affirm by writing or printing, that the Pretender has any right to the crown, that the king and parliament cannot limit the succession to it, or who hold correspondence with the Pretender, or any person em-  
ployed



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Scotland.  
Pains of  
treason.

played by him, are also guilty of treason.

11. The forms of proceeding in the trial of treason, whether against peers or commoners, are set forth in a small treatise, published by order of the house of lords in 1709, subjoined to a collection of statutes concerning treason. By the conviction upon this trial, the whole estate of the traitor forfeits to the crown. His blood is also corrupted, so that, on the death of an ancestor, he cannot inherit; and the estate which he cannot take, falls to the immediate superior as escheat, *ob defectum heredis*, without distinguishing whether the lands hold of the crown, or of a subject. No attainder for treason shall, after the death of the Pretender and all his sons, hurt the right of any person, other than that of the offender, during his natural life; the rights of creditors and other third parties in the case of forfeiture on treason, must be determined by the law of England.

Misprison  
of treason.

12. *Misprison of treason*, from *meprendre*, is the overlooking or concealing of treason. It is inferred by one's bare knowledge of the crime, and not discovering it to a magistrate or other person intitled by his office to take examinations; though he should not in the least degree assent to it. The forefaid act 7 *An.* makes the English law of misprison ours. Its punishment is, by the law of England, perpetual imprisonment, together with the forfeiture of the offender's moveables, and of the profits of his heritable estate, during his life; that is, in the style of our law, his single and life-entailed escheat.

Sedition.

13. The crime of *sedition* consists in the raising commotions or disturbances in the state. It is either verbal or real. Verbal sedition, or leasing making, is inferred from the uttering of words tending to create discord between the king and his people. It is punished either by imprisonment, fine, or banishment, at the discretion of the judge. Real sedition is generally committed by convoking together any considerable number of people, without lawful authority, under the pretence of redressing some public grievance, to the disturbing of the public peace. Those who are convicted of this crime are punished by the confiscation of their goods; and their lives are at the king's will. If any persons, to the number of 12, shall assemble, and being required by a magistrate or constable to disperse, shall nevertheless continue together for an hour after such command, the persons disobeying shall suffer death and confiscation of moveables.

Corruption  
in judges.

14. Judges, who, wilfully or through corruption, use their authority as a cover to injustice or oppression, are punished with the loss of honour, fame, and dignity. Under this head may be classed *theftbote* (from *bote*, compensation), which is the taking a consideration in money or goods from a thief to exempt him from punishment, or connive at his escape from justice. A sheriff or other judge, guilty of this crime, forfeits his life and goods. And even a private person, who takes theftbote, suffers as the principal thief. The buying of disputed claims, concerning which there is a pending process, by any judge or member either of the session, or of an inferior court, is punished by the loss of the delinquent's office, and all the privileges thereto belonging.

Deforcement.

15. *Deforcement* is the opposition given, or resistance made, to messengers or other officers, while they

are employed in executing the law. The court of session is competent to this crime. It is punishable with the confiscation of moveables, the one half to the king, and the other to the creditor at whose suit the diligence was used. Armed persons, to the number of three or more, assisting in the illegal running, landing, or exporting of prohibited or uncustomed goods, or any who shall resist, wound, or maim any officer of the revenue in the execution of his office, are punishable with death and the confiscation of moveables.

16. *Breach of arrestment*, (see N° lxxviii. 5.) is a Breach of the crime of the same nature with deforcement, as it imports a contempt of the law and of our judges. It subjects to an arbitrary corporal punishment, and the escheat of moveables; with a preference to the creditor for his debt, and for such farther sum as shall be modified to him by the judge. Under this head of crimes against good government and police, may be reckoned the *foreclosing of markets*; that is, the buying of goods intended for a public market, before they are carried there; which for the third criminal act, infers the escheat of moveables; as also slaying salmon in forbidden time, destroying plough-graith in time of tillage, slaying or houghing horses or cows in time of harvest, and destroying or spoiling growing timber; as to the punishment of which, see statutes 1503, c. 72. — 1587, c. 82. and 1689, c. 16—1. *Geo. I. St. 2. c. 48.*

17. Crimes against particular persons may be directed either against life, limb, liberty, chastity, goods, or reputation. *Murder* is the wilful taking away of a person's life, without a necessary cause. Our law makes no distinction betwixt premeditated and sudden homicide; both are punished capitally. Casual homicide, where the actor is in some degree blameable; and homicide in self-defence, where the just bounds of defence have been exceeded; are punished arbitrarily; but the slaughter of night-thieves, house-breakers, assistants in masterful depredations, or rebels denounced for capital crimes, may be committed with impunity. The crime of *dismemberment*, or the cutting off of a member, is joined with that of murder; but in practice, its punishment has been restricted to the escheat of moveables, and an assythment or indemnification to the party. *Mutilation*, or the disabling of a member, is punished at the discretion of the judge.

18. *Self-murder* is as highly criminal as the killing Self-murder our neighbour; and for this reason, our law has, contrary to the rule, *crimina morte extinguuntur*, allowed a proof of the crime, after the offender's death, that his single escheat might fall to the king or his donatory. To this end, an action must be brought, not before the judiciary, but the session, because it is only intended *ad civilem effectum*, for proving and declaring the self-murder; and the next of kin to the deceased must be made a party to it.

19. The punishment of parricide, or of the murder of a parent, is not confined, by our law, to the criminal himself. All his posterity in the right line are declared incapable of inheriting; and the succession devolves on the next collateral heir. Even the cursing or beating of a parent infers death, if the person guilty be above 16 years; and an arbitrary punishment, if he be under it. A presumptive or statutory murder is constituted by 1690, c. 21. by which any woman who shall

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Murder

Parricide

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shall conceal her pregnancy, during its whole course, and shall not call for, or make use of help in the birth, is to be reputed the murderer, if the child be dead, or amissing. This act was intended to discourage the unnatural practice of women making away with their children begotten in fornication, to avoid church-censures.

elling.

20. *Duelling*, is the crime of fighting in single combat, on previous challenges given and received. Fighting in a duel, without licence from the king, is punishable by death; and whatever person, principal or second, shall give a challenge to fight a duel, or shall accept a challenge, or otherwise engage therein, is punished by banishment and escheat of moveables, though no actual fighting should ensue.

like-

21. *Haitfacken*, (from *hain*, home, and *facken*, to seek or pursue,) is the assaulting or beating of a person in his own house. The punishment of this crime is now here defined, except in the books of the Majesty, which make it the same as that of a rape; and it is, like rape, capital by our practice. The assault must be made in the proper house of the person assaulted, where he lies and rises daily and nightly, so that neither a public house, nor even a private, where one is only transiently, falls within the law.

tery.

22. Any party to a law-suit, who shall slay, wound, or otherwise invade his adversary, at any period of time between executing the summons and the complete execution of the decree, or shall be accessory to such invasion, shall lose his cause. The sentence pronounced on this trial, against him who has committed the battery, is not subject to reduction, either on the head of minority, or on any other ground whatever: and if the person prosecuted for this crime shall be denounced for not appearing, his liferent, as well as single escheat, falls upon the denunciation.

longous  
serious  
int.

23. The crime of *wrongous imprisonment* is inferred, by granting warrants of commitment in order to trial, proceeding on informations not subscribed, or without expressing the cause of commitment; by receiving or detaining prisoners on such warrants; by refusing to a prisoner a copy of the warrant of commitment; by detaining him in close confinement, above eight days after his commitment; by not releasing him on bail, where the crime is bailable; and by transporting persons out of the kingdom, without either their own consent, or a lawful sentence. The persons guilty of a wrongous imprisonment, are punished by a pecuniary mulct, from L. 6000 down to L. 400 *Scots*, according to the rank of the person detained; and the judge, or other person guilty, is over and above subjected to pay to the person detained a certain sum *per diem*, proportioned to his rank, and is declared incapable of public trust. All these penalties may be insisted for by a summary action before the session, and are subject to no modification.

ultery.

24. *Adultery*, is the crime by which the marriage-bed is polluted. This crime could, neither by the Roman nor Jewish law, be committed, but where the guilty woman was the wife of another: by ours, it is adultery, if either the man or woman be married. We distinguish between simple adultery, and that which is notorious or manifest. Open and manifest adulterers, who continue incorrigible, notwithstanding the censures of the church, are punished capitally.

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This crime is distinguished by one or other of the following characters; where there is issue procreated between the adulterers; or where they keep bed and company together notoriously; or where they give scandal to the church, and are, upon their obstinate refusing to listen to their admonitions, excommunicated. The punishment of simple adultery, not being defined by statute, is left to the discretion of the judge; but custom has made the falling of the single escheat one of its penalties.

Bigamy.

25. *Bigamy*, is a person's entering into the engagements of a second marriage, in violation of a former marriage-vow still subsisting. Bigamy, on the part of the man, has been tolerated in many states, before the establishment of Christianity, even by the Jews themselves; but it is prohibited by the precepts of the gospel, and it is punished by our law, whether on the part of the man or of the woman, with the pains of perjury.

Incest.

26. *Incest*, is committed by persons who stand within the degrees of kindred forbidden in *Lev. xviii.* and is punished capitally. The same degrees are prohibited in affinity, as in consanguinity, *Lev. xviii. 13. et seq.* As this crime is repugnant to nature, all children, whether lawful or natural, stand on an equal footing: *civilis ratio civilia jura corrumpere potest, non vero naturalia.* It is difficult indeed to bring a legal proof of a relation merely natural, on the side of the father; but the mother may be certainly known without marriage.

Rape.

26. There is no explicit statute making rape, or the ravishing of women, capital; but it is plainly supposed in act 1612. c. 4. by which the ravisher is exempted from the pains of death, only in the case of the woman's subsequent consent, or her declaration that she went off with him of her own free-will; and even then, he is to suffer an arbitrary punishment, either by imprisonment, confiscation of goods, or a pecuniary fine.

Theft.

28. *Theft* is defined, A fraudulent intermeddling with the property of another, with a view of making gain. Our ancient law proportioned the punishment of the theft to the value of the goods stolen; heightening it gradually, from a slight corporal punishment to a capital, if the value amounted to thirty-two pennies Scots, which in the reign of David I. was the price of two sheep. In several latter acts, it is taken for granted, that this crime is capital. But where the thing stolen is of small value, we consider it, not as theft, but as pickpocketry, which is punished either corporally or by banishment. The breaking of orchards, and the stealing of green wood, is punished by a fine, which rises as the crime is repeated.

29. Theft may be aggravated into a capital crime, though the value of the thing stolen be trifling; as theft twice repeated, or committed in the night, or by landed men; or of things set apart for sacred uses. The receivers and concealers of stolen goods, knowing them to be such, suffer as thieves. Those who barely harbour the person of the criminal within 48 hours either before or after committing the crime, are punished as partakers of the theft. Such as sell goods belonging to thieves or lawless persons who dare not themselves come to market, are punished with banishment and the escheat of moveables.

Reset of  
theft.

30. Theft attended with violence is called *robbery*; and

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Robbery,  
&c.

and in our old statutes, *rief or stouthrief*; under which clause may be included *forming*, or the taking of meat and drink by force, without paying for it. Stouthrief came at last to be committed so audaciously, by bands of men associated together, that it was thought necessary to vest all our freeholders with a power of holding courts upon forners and rieviers, and condemning them to death. Nay, all were capitally punished, who, to secure their lands from depredation, paid to the rieviers a yearly contribution, which got the name of *black-mail*. An act also passed, commanding to banishment a band of forners, who were originally from *Egypt*, called *gypsies*, and adjudging to death all that should be reputed *Egyptians*, if found thereafter within the kingdom. Robbery committed on the seas, is called *piracy*, and is punished capitally by the high admiral. Several of the facts which constitute this crime are set forth in a British statute, 8 Geo. I. c. 24.

Falschood.

31. *Falschood*, in a large sense, is the fraudulent imitation or suppression of truth, to the damage of another. The lives and goods of persons convicted of using false weights or measures were, by our old law, in the king's mercy; and their heirs could not inherit but upon a remission. The latest statute against this crime, punishes it by confiscation of moveables. That particular species of falschood, which consists in the falsifying of writings, passes by the name of *forgery*. Our practice has now of a long time, agreeably to the Roman law, made this crime capital; unless the forgery be of executions, or other writings of smaller moment; in which case, it is punished arbitrarily.

Forgery.

32. The writing must not only be fabricated, but put to use or founded on, in order to infer this crime. And though it be strictly criminal, yet the trial of it is proper to the court of session; but where improbation is moved against a deed by way of exception, the inferior judge, before the action lies, is competent to it *ad civilem effectum*. When it is pleaded as an exception, our practice, to discourage affected delays, obliges the defender, who moves it, to consign L. 40 Scots; which he forfeits, if his plea shall appear calumnious.

33. Where a person, found guilty of forgery by the court of session, is by them remitted to the judiciary, an indictment is there exhibited against him, and a jury sworn, before whom the decree of session is produced, in place of all other evidence of the crime, in respect of which the jury find the panel guilty; so that that decree being pronounced by a competent court, is held as full proof, or, in the style of the bar, as *probato probata*.

Perjury.

34. *Perjury*, which is the judicial affirmation of a falsehood on oath, really constitutes the *crimen falsi*; for he who is guilty of it does, in the most solemn manner, substitute falschood in the place of truth. To constitute this crime, the violation of truth must be deliberately intended by the swearer; and therefore reasonable allowances ought to be given to forgetfulness or misapprehension, according to his age, health, and other circumstances. The breach of a promissory oath does not infer this crime; for he who promises on oath, may sincerely intend performance when he swears, and so cannot be said to call on God to attest a falsehood. Though an oath, however false, if made upon reference in a civil question, concludes the cause, the

person perjured is liable to a criminal trial; for the effect of the reference can go no further than the private right of the parties.

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35. Notwithstanding the mischievous consequences of perjury to society, it is not punished capitally, but by confiscation of moveables, imprisonment for a year, and infamy. The court of session is competent to perjury *incidenter*, when in any examination upon oath, taken in a cause depending before them, a person appears to have sworn falsely; but in the common case, that trial is proper to the judiciary. *Subornation of perjury* consists in tampering with persons who are to swear in judgment, by directing them how they are to depose; and it is punished with the pains of perjury.

36. The crime of *stellionate*, from *stellio*, includes every fraud which is not distinguished by a special name; but is chiefly applied to conveyances of the same numerical right, granted by the proprietor to different disponees. The punishment of stellionate must necessarily be arbitrary, to adapt it to the various natures and different aggravations of the fraudulent acts. The persons guilty of that kind of it, which consists in granting double conveyances, are by our law declared infamous, and their lives and goods at the king's mercy. The cognizance of *fraudulent bankruptcy* is appropriated to the court of session, who may inflict any punishment on the offender, that appears proportioned to his guilt, death excepted.

37. The crime of *usury*, before the reformation, *Usury* consisted in the taking of any interest for the use of money; and now in taking an higher rate of interest than is authorized by law. It is divided into *usura manifesta*, or direct; and *velata*, or covered. One may be guilty of the first kind, either where he covenants with the debtor for more than the lawful interest on the loan-money; or where one receives the interest of a sum before it is due, since thereby he takes a consideration for the use of money before the debtor has really got the use of it. Where a debt is clogged with an uncertain condition, by which the creditor runs the hazard of losing his sum, he may covenant for an higher interest than the legal, without the crime of usury; for there, the interest is not given merely in consideration of the use of the money, but of the danger undertaken by the creditor.

38. Covered usury, is that which is committed under the mask, not of a loan, but of some other contract; e. g. a sale, or an improper wadset. And in general, all obligations entered into with an intention of getting more than the legal interest for the use of money, however they may be disguised, are usurious. As a farther guard against this crime, the taking more than the legal interest for the forbearance of payment of money, merchandise, or other commodities, by way of loan, exchange, or other contrivance whatever, or the taking a bribe for the loan of money, or for delaying its payment when lent, is declared usury. Where usury is proved, the usurious obligation is not only declared void, but the creditor, if he has received any unlawful profits, forfeits the treble value of the sums or goods lent. Usury, when it is to be pursued criminally, must be tried by the judiciary; but where the libel concludes only for voiding the debt or restitution, the session is the proper court.



39. *Injury*, in its proper acceptation, is the reproaching or affronting our neighbour. Injuries are either verbal or real. A verbal injury, when directed against a private person, consists in the uttering contumelious words, which tend to expose our neighbour's character by making him little or ridiculous. It does not seem that the twitting one with natural defects, without any farcical reflections, though it be inhuman, falls under this description, as these imply no real reproach in the just opinion of mankind. Where the injurious expressions have a tendency to blacken one's moral character, or fix some particular guilt upon him, and are deliberately repeated in different companies, or handed about in whispers to confidants, it then grows up to the crime of slander: and where a person's moral character is thus attacked, the *animus injuriandi* is commonly inferred from the injurious words themselves, unless special circumstances be offered to take off the presumption; *ex. gr.* that the words were uttered in judgement in one's own defence, or by way of information to a magistrate, and had some foundation in fact. Though the cognizance of slander is proper to the commissaries, who, as the *judices Christianitatis*, are the only judges of scandal; yet for some time past, bare verbal injuries have been tried by other criminal judges, and even by the Session. It is punished either by a fine, proportioned to the condition of the persons injuring and injured, and the circumstances of time and place; or if the injury import scandal, by publicly acknowledging the offence; and frequently the two are conjoined. The calling one a bankrupt is not, in strict speech, a verbal injury, as it does not affect the person's moral character; yet as it may hurt his credit in the way of business, it founds him in an action of damages, which must be brought before the judge-ordinary. A real injury is inflicted by any fact by which a person's honour or dignity is affected; as striking one with a cane, or even aiming a blow without striking; spitting in one's face; assuming a coat of arms, or any other mark of distinction proper to another, &c. The composing and publishing defamatory libels may be reckoned of this kind. Real injuries are tried by the judge-ordinary, and punished either by fine or imprisonment, according to the demerit of the offenders.

40. After having shortly explained the several crimes punishable by our law, this treatise may be concluded with a few observations on criminal jurisdiction, the forms of trial, and the methods by which crimes may be extinguished. Criminal jurisdiction is founded, 1. *Ratione domicilii*, if the defender dwells within the territory of the judge. Vagabonds, who have no certain *domicile*, may be tried wherever they are apprehended. 2. *Ratione delicti*, if the crime was committed within the territory. Treason is triable, by the English law, in any county that the king should appoint; and, by a temporary act now expired, treason committed in certain Scots counties, was made triable by the court of Justiciary, wherever it should sit.

41. No criminal trial can proceed, unless the person accused is capable of making his defence. Absents therefore cannot be tried; nor fatuous nor furious persons, *durante furore*, even for crimes committed while they were in their senses. For a like reason,

minors who had no curators, could not, by the Roman law, be tried criminally; but our practice considers every person who is capable of doing, to be also sufficiently qualified for making his defence in a criminal trial.

42. No person can be imprisoned in order to stand trial for any crime, without a warrant in writing expressing the cause, and proceeding upon a subscribed information, unless in the case of indignities done to judges, riots, and the other offences specially mentioned in 1701, c. 6. Every prisoner committed in order to trial, if the crime of which he is accused be not capital, is entitled to be released upon bail, the extent of which is to be modified by the judge, not exceeding 12,000 merks Scots for a nobleman, 6000 for a landed gentleman, 2000 for every other gentleman or burgess, and 600 for any other inferior person. That persons who, either from the nature of the crime with which they are charged, or from their low circumstances, cannot procure bail, may not lie for ever in prison untied, it is lawful for every such prisoner, to apply to the criminal judge, that his trial may be brought on. The judge must, within 24 hours after such application, issue letters directed to messengers, for intimating to the prosecutor to fix a diet for the prisoner's trial, within 60 days after the intimation, under the pain of wrongous imprisonment: And if the prosecutor does not insist within that time, or if the trial is not finished in forty days more when carried on before the Justiciary, or in thirty when before any other judge; the prisoner is, upon a second application, setting forth that the legal time is elapsed, entitled to his freedom, under the same penalty.

43. Upon one's committing any of the grosser crimes, it is usual for a justice of the peace, sheriff, or other judge, to take a precognition of the facts, *i. e.* to examine those who were present at the criminal act, upon the special circumstances attending it, in order to know whether there is ground for a trial, and to serve as a direction to the prosecutor, how to set forth the facts in the libel; but the persons examined may insist to have their declarations cancelled, before they give testimony at the trial. Justices of the peace, sheriffs, and magistrates of boroughs, are also authorized to receive informations, concerning crimes to be tried in the circuit-courts; which informations are to be transmitted to the justice-clerk 40 days before the sitting of the respective courts. To discourage groundless criminal trials, all prosecutors, where the defender was absolved, were condemned by statute, in costs, as they should be modified by the judge, and besides were subjected to a small fine, to be divided between the solicitor and the defender: And where the king's advocate was the only pursuer, his informer was made liable. This vexatious warrants the present practice of condemning vexatious prosecutors in a pecuniary mulct, though far exceeding the statutory sum.

44. The forms of trial upon criminal accusations, differ much from those observed in civil actions, if we except the case of such crimes as the court of Session is competent to, and of lesser offences tried before inferior courts. The trial of crimes proceeds, either upon indictment, which is sometimes used when the person to be tried is in prison; or by criminal letters issuing

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from the signet of the Justiciary. In either case, the defender must be served with a full copy of the indictment or letters, and with a list of the witnesses to be brought against him, and of the persons who are to pass on the inquest, and 15 free days must intervene between his being so served, and the day of appearance. When the trial proceeds upon criminal letters, the private prosecutor must give security, at raising the letters, that he will report them duly executed to the Justiciary, in terms of 1535, c. 35.; and the defender, if he be not already in prison, is, by the letters, required to give caution, within a certain number of days after his citation, for his appearance upon the day fixed for his trial: And if he gives none within the days of the charge, he may be denounced rebel, which infers the forfeiture of his moveables.

45. That part of the indictment, or of the criminal letters, which contains the ground of the charge against the defender, and the nature or degree of the punishment he ought to suffer, is called the *libel*. All libels must be special, setting forth the particular facts inferring the guilt, and the particular place where these facts were done. The time of committing the crime may be libelled in more general terms, with an alternative as to the month, or day of the month: but as it is not practicable, in most cases, to libel upon the precise circumstances of accession that may appear in proof, libels against accessories are sufficient, if they mentioned, in general, that the persons prosecuted are guilty art and part.

46. The defender, in a criminal trial, may raise letters of exculpation, for citing witnesses in proof of his defences against the libel, or of his objections against any of the jury or witnesses; which must be executed to the same day of appearance with that of the indictment or criminal letters.

Diets of  
appearance.

47. The diets of appearance, in the court of Justiciary, are peremptory: the criminal letters must be called on the very day to which the defender is cited; and hence, if no accuser appears, their effect is lost, *instantia perit*, and new letters must be raised. If the libel, or any of the executions, shall to the prosecutor appear informal, or if he be diffident of the proof, from the absconding of a necessary witness, the court will, upon a motion made by him, desert the diet *pro loco et tempore*; after which new letters become also necessary. A defender, who does not appear on the very day to which he is cited, is declared fugitive; in consequence of which, his single escheat falls. The defender, after his appearance in court, is called the *pannel*.

48. The two things to be chiefly regarded in a criminal libel, are, 1. The relevancy of the facts, *i. e.* their sufficiency to infer the conclusion; 2. Their truth. The consideration of the first belongs to the judge of the court; that of the other, to the jury or assize. If the facts libelled be found irrelevant, the pannel is dismissed from the bar; if relevant, the court remits the proof thereof to be determined by the jury; which must consist of 15 men picked out by the court from a greater number not exceeding 45, who have been all summoned, and given in list to the defender at serving him with a copy of the libel.

Probation  
of crimes.

49. Crimes cannot, like debts, be referred to the defender's oath; for no person is compellable to swear

against himself, where his life, limb, liberty, or estate is concerned, nor even in crimes which infer infamy; because one's good name is, in right estimation, as valuable as his life. There is one exception however to this rule in trying the crime of usury, which may be proved by the usurer's own oath, notwithstanding the rule, *nemo tenetur jurare in suam turpitudinem*. Crimes therefore are in the general case provable only by the defender's free confession, or by writing, or by witnesses. No extrajudicial confession, unless it is adhered to by the pannel in judgment, can be admitted as evidence.

50. All objections relevant against a witness in civil cases are also relevant in criminal. No witness is admitted, who may gain or lose by the event of the trial. *Socii criminis*, or associates in the same crime, are not admitted against one another, except either in crimes against the state, as treason; in occult crimes, where other witnesses cannot be had, as forgery; or in thefts or depredations committed in the Highlands. The testimony of the private party injured may be received against the pannel, where the king's advocate is the only prosecutor, if, from the nature of the crime, there must needs be a penalty of witnesses, as in rape, robbery, &c.

Verdict  
affixed.

51. After all the witnesses have been examined in court, the jury are shut up in a room by themselves, where they must continue, excluded from all correspondence, till their verdict or judgment be subscribed by the foreman (or chancellor), and clerk; and according to this verdict the court pronounces sentence, either absolving or condemning. It is not necessary, by the law of Scotland, that a jury should be unanimous in finding a person guilty; the narrowest majority is as sufficient against the pannel, as for him. Juries cannot be punished on account of an erroneous verdict, either for or against the pannel.

52. Though the proper business of a jury be to inquire into the truth of the facts found relevant by the court, for which reason they are sometimes called the *inquest*; yet, in many cases, they judge also in matters of law or relevancy. Thus, though an objection against a witness should be repelled by the court, the jury are under no necessity to give more credit to his testimony than they think just: And in all trials of art and part, where special facts are not libelled, the jury, if they return a general verdict, are indeed judges not only of the truth, but of the relevancy of the facts that are sworn to by the witnesses. A general verdict, is that which finds in general terms, that the pannel is guilty or not guilty, or that the libel or defences are proved or not proved. In a special verdict, the jury finds certain facts proved, the import of which is to be afterwards considered by the court.

Power  
of a jury.

53. Criminal judges must now suspend for some time the execution of such sentences as affect life or limb, that so condemned criminals, whose cases deserve favour, may have access to apply to the king for mercy. No sentence of any court of judicature, south of the river Forth, importing either death or demembration, can be executed in less than 30 days; and, if north of it, in less than 40 days, after the date of the sentence. But corporal punishments, less than death or dismembering, *e. g.* whipping, pillory, &c. may be inflicted eight days after sentence on this side Forth,

and

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Distinction crimes.

and twelve days after sentence beyond it.

54. Crimes are extinguished, 1. By the death of the criminal; both because a dead person can make no defence, so that his trial is truly a judging upon the hearing of one side; and because, though his guilt should be ever so notorious, he is after death carried beyond the reach of human penalties: Such trials therefore can have no effect, but to punish the innocent heir, contrary to that most equitable rule, *culpa tenet suos auctores*. 2. Crimes may be extinguished by a remission from the sovereign. But a remission, tho' it secures the delinquent from the public resentment, the exercise of which belongs to the Crown, cannot cut off the party injured from his claim of damages, over which the crown has no prerogative. Whoever therefore founds on a remission, is liable in damages to the private prosecutor, in the same manner as if he had been tried and found guilty. Even general acts of indemnity passed in parliament, though they secure against such penalties as law inflicts upon the criminal merely *per modum pene*, yet do not against the payment of any pecuniary fine that is given by statute to the party injured, nor against the demand of any claim competent to him in name of damages.

55. Lesser injuries, which cannot be properly said to affect the public peace, may be extinguished, either by the private party's expressly forgiving him, or by his being reconciled to the offender, after receiving the injury. Hence arises the rule, *diffimulatione tollitur injuria*. But where the offence is of a higher nature, the party injured, though he may pass from the prosecution, in so far as his private interest is concerned, cannot preclude the king's advocate, or procurator.

## L A W

**LAW-Language.** In England all law-proceedings were formerly written, as indeed all public proceedings were, in Norman or law French, and even the arguments of the counsel and decisions of the court were in the same barbarous dialect. An evident and shameful badge, it must be owned, of tyranny and foreign servitude; being introduced under the auspices of William the Norman, and his sons: whereby the observation of the Roman satyrist was once more verified, that *Gallia caudicibus docuit facunda Britannos*. This continued till the reign of Edward III.; who, having employed his arms successfully in subduing the crown of France, thought it unbecoming the dignity of the victors to use any longer the language of a vanquished country. By a statute therefore, passed in the 36th year of his reign, it was enacted, that for the future all pleas should be pleaded, shewn, defended, answered, debated, and judged, in the English tongue; but be entered and enrolled in Latin: In like manner as Don Alonso X. king of Castile (the great-grandfather of our Edward III.) obliged his subjects to use the Castilian tongue in all legal proceedings; and as, in 1286, the German language was established in the courts of the empire. And perhaps, if our legislature had then directed that the writs themselves, which are mandates from the king to his subjects to perform certain acts or to appear at certain places, should have been framed in the English language, according to the rule of our ancient law, it had not been very improper. But the record or enrollment of those writs and the proceed-

fiscal, from instituting *ad studiolum publicum*.

56. Crimes are also extinguished by prescription, which operates by the mere lapse of time, without any act either of the sovereign or of the private sufferer. Crimes prescribe in 20 years; but in particular crimes, the prescription is limited by statute to a shorter time. No person can be prosecuted upon the act against wrongous imprisonment, after three years. High treason, committed within his Majesty's dominions, suffers likewise a triennial prescription, if indictment be not found against the traitor within that time. All actions brought upon any penal statute made or to be made, where the penalty is appropriated to the crown, expire in two years after committing the offence; and where the penalty goes to the Crown or other prosecutor, the prosecutor must sue within one year, and the Crown within two years after the year ended. Certain crimes are, without the aid of any statute, extinguished by a shorter prescription than 20 years. By our old law, in the cases of rape, robbery, and hamefucken, the party injured was not heard, after a silence of 24 hours; from a presumption, that persons could not be so grossly injured, without immediately complaining: And it is probable, that a prosecution for these crimes, if delayed for any considerable time, would be cast even at this day, or at least the punishment restricted. Lesser injuries suffer also a short prescription; law *presuming* forgiveness, from the nature of the offence, and the silence of the party. The particular space of time sufficient to establish this presumption must be determined by the judge, according to circumstances.

## L A W

ings thereon, which was calculated for the benefit of posterity, was more serviceable (because more durable) in a dead and immutable language than in any flux or living one. The practisers however, being used to the Norman language, and therefore imagining they could express their thoughts more aptly and more concisely in that than in any other, still continued to take their notes in law French; and of course, when those notes came to be published, under the denomination of *reports*, they were printed in that barbarous dialect; which, joined to the additional terrors of a Gothic black letter, has occasioned many a student to throw away his Plowden and Littleton, without venturing to attack a page of them. And yet in reality, upon a nearer acquaintance, they would have found nothing very formidable in the language; which differs in its grammar and orthography as much from the modern French, as the diction of Chaucer and Gower does from that of Addison and Pope. Besides, as the English and Norman languages were concurrently used by our ancestors for several centuries together, the two idioms have naturally assimilated, and mutually borrowed from each other: for which reason the grammatical construction of each is so very much the same, that I apprehend an Englishman (with a week's preparation) would understand the laws of Normandy, collected in their *grand coutumier*, as well if not better than a Frenchman bred within the walls of Paris.

The Latin, which succeeded the French for the entry and enrollment of pleas, and which continued in



use for four centuries, answers so nearly to the English (ostentins word for word) that it is not at all surprising it should generally be imagined to be totally fabricated at home, with little more art or trouble than by adding Roman terminations to English words. Whereas in reality it is a very universal dialect, spread throughout all Europe at the irruption of the northern nations; and particularly accommodated and moulded to answer all the purposes of the lawyers with a peculiar exactness and precision. This is principally owing to the simplicity, or (if the reader pleases) the poverty and baldness of its texture, calculated to express the ideas of mankind just as they arise in the human mind, without any rhetorical flourishes, or perplexed ornaments of style: for it may be observed, that those laws and ordinances, of public as well as private communities, are generally the most easily understood, where strength and perspicuity, not harmony or elegance of expression, have been principally consulted in compiling them. These northern nations, or rather their legislators, tho' they resolved to make use of the Latin tongue in promulging their laws, as being more durable and more generally known to their conquered subjects than their own Teutonic dialects, yet (either thro' choice or necessity) have frequently intermixed therein some words of a Gothic original; which is, more or less, the case in every country of Europe, and therefore not to be imputed as any peculiar blemish in our English legal latinity. The truth is, what is generally denominated *law-Latin* is in reality a mere technical language, calculated for eternal duration, and easy to be apprehended both in present and future times; and on those accounts best suited to preserve those memorials which are intended for perpetual rules of action. The rude pyramids of Egypt have endured from the earliest ages, while the more modern and more elegant structures of Attica, Rome, and Palmyra, have sunk beneath the stroke of time.

As to the objection of locking up the law in a strange and unknown tongue, this is of little weight with regard to records; which few have occasion to read, but such as do, or ought to, understand the rudiments of Latin. And besides, it may be observed of the law-Latin, as the very ingenious Sir John Davis observes of the law-French, "that it is so very easy to be learned, that the meanest wit that ever came to the study of the law doth come to understand it almost perfectly in ten days without a reader."

It is true indeed, that the many terms of art, with which the law abounds, are sufficiently harsh when Latinized (yet not more so than those of other sciences), and may, as Mr Selden observes, give offence "to some grammarians of squeamish stomachs, who would rather choose to live in ignorance of things the most useful and important, than to have their delicate ears wounded by the use of a word, unknown to Cicero, Sallust, or the other writers of the Augustan age." Yet this is no more than must unavoidably happen when things of modern use, of which the Romans had no idea, and consequently no phrases to express them, come to be delivered in the Latin tongue. It would puzzle the most classical scholar to find an appellation, in his pure Latinity, for a constable, a record, or a deed of seoffment: it is therefore to be imputed as much to necessity, as ignorance, that they were styled

in our forensic dialect, *constabularius*, *recordum*, and *seoffamentum*. Thus again, another uncouth word of our ancient laws (for I defend not the ridiculous barbarisms sometimes introduced by the ignorance of modern practisers) the substantive *murdrum*, or the verb *murdrare*, however harsh and unclassical it may seem, was necessarily framed to express a particular offence; since no other word in being, *occidere*, *interficere*, *ne-care*, or the like, was sufficient to express the intention of the criminal, or *quo animo* the act was perpetrated; and therefore by no means came up to the notion of murder at present entertained by our law; viz. a killing *with malice aforethought*.

A similar necessity to this produced a similar effect at Byzantium, when the Roman laws were turned into Greek for the use of the oriental empire: for, without any regard to Attic elegance, the lawyers of the imperial courts made no scruple to translate *fidei commissarios*, *ἐπίδοκομιστᾶριους*; *cubiculum*, *κυβικλίσιον*; *filium-familias*, *παῖδα-φωμιλίας*; *repudium*, *ῤηπίδιον*; *compromissum*, *κομπρωμισσιον*; *reverentia et obsequium*, *ὑπερηβήτις καὶ ὀβσεκιον*; and the like. They studied more the exact and precise import of the words, than the neatness and delicacy of their cadence. And it may be suggested, that the terms of the law are not more numerous, more uncouth, or more difficult to be explained by a teacher, than those of logic, physics, and the whole circle of Aristotle's philosophy; nay, even of the politer arts of architecture and its kindred studies, or the science of rhetoric itself. Sir Thomas More's famous legal question contains in it nothing more difficult, than the definition which in his time the philosophers currently gave of their *materia prima*, the groundwork of all natural knowledge; that it is *neque quid, neque quantum, neque quale, neque aliquid eorum quibus est determinatur*; or its subsequent explanation by Adrian Heereboord, who assures us, that *materia prima non est corpus, neque per formam corporeitatis, neque per simplicem essentiam: est tamen ens, et quidem substantia, licet incompleta; habetque actum ex se entitativum, et simul est potentia subjectiva*. The law therefore, with regard to its technical phrases, stands upon the same footing with other studies, and requests only the same indulgence.

This technical Latin continued in use from the time of its first introduction, till the subversion of our ancient constitution under Cromwell; when, among many other innovations in the law, some for the better and some for the worse, the language of our records was altered and turned into English. But, at the restoration of king Charles, this novelty was no longer countenanced; the practisers finding it very difficult to express themselves so concisely or significantly in any other language but the Latin. And thus it continued without any sensible inconvenience till about the year 1730, when it was again thought proper that the proceedings at law should be done in English, and it was accordingly so ordered by statute 4 Geo. II. c. 26. This was done, in order that the common people might have knowledge and understanding of what was alleged or done for and against them in the process and pleadings, the judgment and entries in cause. Which purpose it is doubtful how well it has answered; but there is reason to suspect, that the people are now, after many years experience, altogether as ignorant in matters of law as before.

fore. On the other hand, these inconveniences have already arisen from the alteration; that now many clerks and attorneys are hardly able to read, much less to understand, a record even of so modern a date as the reign of George I. And it has much enhanced the expence of all legal proceedings: for since the practitioners are confined (for the sake of the stampduties, which are thereby considerably increased) to write only a stated number of words in a sheet; and as the English language, through the multitude of its particles, is much more verbose than the Latin; it follows that the number of sheets must be very much augmented by the change. The translation also of technical phrases, and the names of writs and other process, were found to be so very ridiculous (a writ of *nisi prius*, *quare impedit*, *ferri facias*, *habeas corpus*, and the rest, not being capable of an English dress with any degree of seriousness) that in two years time a new act was obliged to be made, 6 Geo. II. c. 14. which allows all technical words to continue in the usual language, and has thereby defeated every beneficial purpose of the former statute.

*Trial by Wager of Law*, (*vadiatio legis*;) a species of trial, in the English law, so called, as another species is styled "wager of battel," *vadiatio duelli*, (see *BATTEL*): because, as in the wager of battel, the defendant gave a pledge, gage, or *vadium*, or try the cause by battel; so here he was put in sureties or *vadiors*, that at such a day he will make his law, that is, take the benefit which the law has allowed him, (see the article *TRIAL*.) For our ancestors considered, that there were many cases where an innocent man, of good credit, might be overborne by a multitude of false witnesses; and therefore established this species of trial, by the oath of the defendant himself: for if he will absolutely swear himself not chargeable, and appears to be a person of reputation, he shall go free, and for ever acquitted of the debt, or other cause of action.

The manner of waging and making law is this. He that has waged, or given security, to make his law, brings with him into court eleven of his neighbours: a custom, which we find particularly described so early as in the league between Alfred and Guthrun the Dane; for by the old Saxon constitution every man's credit in courts of law depended upon the opinion which his neighbours had of his veracity. The defendant then, standing at the end of the bar, is admonished by the judges of the nature and danger of a false oath. And if he still persists, he is to repeat this or the like oath: "Hear this, ye justices, that I do not owe unto Richard Jones the sum of ten pounds, nor any penny thereof, in manner and form as the said Richard hath declared against me. So help me God." And thereupon his eleven neighbours or compurgators shall avow upon their oaths, that they believe in their consciences that he saith the truth; so that himself must be sworn *de fidelitate*, and the eleven *de credulitate*.

In the old Swedish or Gothic constitution, wager of law was not only permitted, as it is in criminal cases, unless the fact be extremely clear against the prisoner; but was also absolutely required, in many civil cases: which an author of their own very justly charges as being the source of frequent perjury. This, he tells us, was owing to the Popish ecclesiastics, who

introduced this method of purgation from their canon law; and, having sown a plentiful crop of oaths in all judicial proceedings, reaped afterwards an ample harvest of perjuries: for perjuries were punished in part by pecuniary fines, payable to the coffers of the church. But with us in England wager of law is never required; and then only admitted, where an action is brought upon such matters as may be supposed to be privately transacted between the parties, and wherein the defendant may be presumed to have made satisfaction without being able to prove it. Therefore it is only in actions of debt upon simple contract, or for amercement, in actions of detinue, and of account, where the debt may have been paid, the goods restored, or the account balanced, without any evidence of either. And by such wager of law (when admitted) the plaintiff is perpetually barred; for the law, in the simplicity of the ancient times, presumed that a man would forswear himself for any worldly thing. Wager of law, however, lieth in a real action, where the tenant alleges he was not legally summoned to appear, as well as in mere personal contracts.

The wager of law was never permitted but where the defendant bore a fair and unreproachable character; and it was also confined to such cases where a debt might be supposed to be discharged, or satisfaction made in private, without any witnesses to attest it: and many other prudential restrictions accompanied this indulgence. But at length it was considered, that (even under all its restrictions) it threw too great a temptation in the way of indigent or profligate men: and therefore by degrees new remedies were devised, and new forms of action were introduced, wherein no defendant is at liberty to wage his law. So that now no plaintiff need at all apprehend any danger from the hardihood of his debtor's conscience, unless he voluntarily chooses to rely on his adversary's veracity, by bringing an obsolete, instead of a modern, action. Therefore, one shall hardly hear at present of an action of debt brought upon a simple contract: that being supplied by an action of *trespass on the case* for the breach of a promise or *assumpsit*; wherein, though the specific debt cannot be recovered, yet damages may, equivalent to the specific debt. And, this being an action of trespass, no law can be waged therein. So, instead of an action of *detinue* to recover the very thing detained, an action of trespass on the case in *trover* and *conversion* is usually brought; wherein, though the horse or other specific chattel cannot be had, yet the defendant shall pay damages for the conversion, equal to the value of the chattel; and for this trespass also no wager of law is allowed. In the room of actions of account a bill in equity is usually filed: wherein, though the defendant answers upon his oath, yet such oath is not conclusive to the plaintiff; but he may prove every article by other evidence, in contradiction to what the defendant has sworn. So that wager of law is quite out of use, being avoided by the mode of bringing the action; but still it is not out of force. And therefore, when a new statute inflicts a penalty, and gives an action of debt for recovering it, it is usual to add, "in which no wager of law shall be allowed;" otherwise an hardy delinquent might escape any penalty of the law, by swearing he had never incurred, or else had discharged it.

Customs.

*Custom-House LAWS.* The expedient of exacting duties on goods imported, or exported, has been adopted by every commercial nation in Europe. The attention of the British legislature has not been confined to the object of raising a revenue alone, but they have attempted, by duties, exemptions, drawbacks, bounties, and other regulations, to direct the national trade into those channels that contribute most to the public benefit. And, in order to obtain every requisite information, all goods, exported or imported, whether liable to duty or not, are required to be entered at the respective custom-houses; and, from these entries, accounts are regularly made up of the whole British trade, distinguishing the articles, their quantity and value, and the countries which supply or receive them.

The objects of the British legislature may be reduced to the following heads:

First, To encourage the employment of British shipping and seamen, for the purpose of supplying our navy when public exigencies require.

Secondly, To increase the quantity of money in the nation, by prohibiting the exportation of British coin, by encouraging exportation, and discouraging importation, and by promoting agriculture, fisheries, and manufactures. For these purposes, it is penal to entice certain manufacturers abroad, or export the tools used in their manufactures; the exportation of raw materials is, in most instances, prohibited; and their importation permitted free from duty, and sometimes rewarded with a bounty. The exportation of some goods, manufactured to a certain length only, (for example white cloth), is loaded with a duty, but permitted duty-free when the manufacture is carried to its full extent. The importation of rival manufactures is loaded with heavy duties, or absolutely prohibited. These restrictions are most severe towards nations with which the balance of trade is supposed against us, or which are considered as our most formidable rivals in power or commerce.

Thirdly, To secure us plenty of necessaries for subsistence and manufacture, by discouraging the exportation of some articles that consume by length of time, and regulating the corn-trade according to the exigencies of the seasons.

Fourthly, To secure the trade of the colonies to the mother-country, and preserve a mutual intercourse, by encouraging the produce of their staple-commodities, and restraining their progress in these manufactures which they receive from us in exchange.

To accomplish these ends, a very complex system of laws has been enacted; the outlines of which we shall lay before the reader. How far the means have contributed to the ends proposed, and how far these ends themselves are always wise; or, whether a trade encumbered by fewer restrictions, would not prove more beneficial, as well as more extensive, may perhaps be called in question: but the discussion of this belongs not to our plan.

I. REGULATIONS concerning IMPORTATION.] The foundation of our commercial regulations is the famous act of navigation, which was first enacted during the time of the commonwealth, and adopted by the first parliament after the restoration. The substance of this act, and subsequent amendments, relating to goods imported, is as follows.

Goods from Asia, Africa, and America, may not be imported, except in British ships duly navigated, or ships belonging to the British plantations; and they can only be imported from the place of their production or manufacture, or the port where they are usually first shipped for transportation:

Except goods from the Straights and Levant, which may be brought from the usual places of lading in British ships; goods brought from Persia, by persons free of the Russia Company, in barter for British goods sent to Russia; and from thence by land-carriage to Persia, and Persian raw silk, any how purchased, imported from Russia in British ships; goods of the Spanish or Portuguese plantations, imported from Spain or Portugal in British ships; gum-senega, from Europe, in British ships; bullion, cochineal, and indigo; spice, by licence; coarse printed calicoes, cawries, and arranges, for the African market, by licence; and goods taken as prize.

The restriction on European goods is not universal, but extends to several of the bulkiest articles. Russian goods, malts, timber, boards, salt, pitch, rosin, tar, hemp, flax, raisins, figs, prunes, olives, oil, corn, sugar, potashes, wine, and vinegar, may not be imported, except in ships belonging to Great Britain or Ireland, legally manned; nor Turkey goods and currants, except in ships British built; or in ships belonging to the country where these goods are produced, or manufactured, or first shipped for exportation; and, if imported in foreign ships, they pay alien-duty.

In order to entitle a ship to the privileges of a British ship, it must belong entirely to British subjects; and the master, and three fourths of the mariners, must be British subjects, except in case of death, or unavoidable accidents. Corn may be exported, and entitled to bounty, if the master and two thirds of the mariners be British subjects. In time of war, the proportion of British mariners required is generally confined to one fourth; and the same proportion only is required in the Greenland fishery. Wool may not be exported to Ireland, except in ships wholly manned by British. Ships foreign built, though belonging to British, are subject to the same duties as ships belonging to foreigners. Ships employed in the Newfoundland fishery must carry one fresh man, (i. e. who has not been at sea before), in five.

In order to prevent a ship from being deprived of the privileges belonging to British ships, no foreigner may purchase a share without consent of three-fourths of the owners. Ships foreign built must be registered, and oath made concerning the property, before they be admitted to the privilege of British ships.

Commanders of ships of war must not allow any merchant-goods to be taken on board, unless by order of the admiralty, or goods taken out of ships in distress, under pain of being cashiered. In these cases, they must report the goods on board, and submit to the same regulations that merchant-ships are subject to.

No merchant-goods may be imported or exported in any packet-boat, unless with the consent of the chief officers of the customs.

*Prohibited goods.* The importation of cattle, beef, mutton,



Custom-house Laws.  
mutton, and port, except from Ireland, is declared a public nuisance. These articles are ordered to be seized at all hands, the cattle to be slain, and distributed among the poor, reserving the hides and tallow to the seizer; and the parish is liable in penalties, if the seizer be neglected.

The following goods are prohibited, and the importers and venders are liable in penalties, from L. 200 to L. 50: and the goods, in some cases, are appointed to be burned; in others, to be sold for exportation. Gold and silver thread, lace, fringe, or other work, or work of copper, brass, or any inferior metal; gold or silver wire, lace, brocade, embroidery. Needle-work of thread or silk, except East India fringes of thread and silk; bone-lace of thread or silk, except of Flanders; cut-work, band-strings. Buttons of all sorts, wire for cards. Wrought silks except Italian, crapes and tiffanies, velvets, silk-ribbons, girdles, laces, or stockings, or ribbons; &c. mixed with silk, gloves, and mits of leather or silk, and thrown silk except Italian. Woollen-cloths. Malt, by the annual malt-bill. Cambrics and French lawns are prohibited to be used in Britain, and may be imported for re-exportation into London only, upon license obtained from the commissioners of the customs, and security granted for re-exportation, in bales containing at least 100 pieces, covered with cloth, and must be lodged in ware-houses, under the joint keys of the proprietor and custom-house officers. Wrought silks, Bengals, and stuffs mixed with silk or herba of East Indian, Persian, or Chinese manufacture, and calicoes painted, printed, stained, or dyed there, may be entered under like restrictions, on payment of the half subsidy only.

The following articles, chiefly of hardware, cutlery, and leathern-ware, may not be imported for sale, and therefore can only be entered for re-exportation, or private use. Andirons, tennis-balls, counterfeit-basons, facing-bells, \* bits, bodkins, brushers, buskins, hanging-candlesticks, playing-cards, wool-cards, \* cauls, \* claps, caskets, chaffing-dishes, chess-men, combs, corsets, \* daggers, dagger-blades, dice, dripping-pans, ewers, forcers, furs tawed, \* girdles, golothes or corks, gridirons, hammers, \* harness or girdles for horses, hats, hilts, \* knives, ladles, any thing wrought of tawed leather, \* locks, pack-needles, painted wares, except paper and pictures, pattens, \* pins, pinsons, points, purses, rings of copper or latten gilt for curtains, \* saddles, \* scabbards, and sheaths, scissars, summers, sheers for taylors, shoes, \* stirrups, tin-ware, tires of gold or silver, fire-tongs, most kinds of iron-wire, wares made thereof, woollen-caps. The articles marked with an \* may, in no case, be imported for sale; the others only from Ireland, or taken upon the seas, or wrecked. A longer list of like articles may not be imported by strangers.

Ammunition, arms, gun-powder, and utensils of war, may not be imported without the king's licence.

The following goods may not be imported from Germany on the Netherlands: olive-oil, pitch, tar, potashes, rosin, salt, picnery, (except by license), tobacco and wines, (except Rhenish wines, or Hungarian wines from Hamburg), also deal-boards and fir-timber, except of the growth of Germany, import-

ed by British subjects, in ships built in and belonging to Britain.

Books, of which the copy-right is in private subjects, may not be imported under the penalty of 1 d. per sheet, besides forfeiture; and books first composed and printed in Britain, and reprinted abroad, may not be imported, unless they have not been printed at home for 20 years. Popish books may not be imported, under penalty of 40s. each book; and Popish crosses, and other superstitious things, under penalty of a premium.

The importation of various other goods is restricted by particular regulations respecting the time and place of importation, the packages, the burden of the ship, and other circumstances.

Spirits, tea, coffee, and cocoa-berries when manufactured into chocolate, are subject to excise or inland duties. The places where these goods are kept and sold must be entered with and inspected by the officers of excise. They may not be removed without a permit; spirits, if above a gallon; tea, coffee, or chocolate, if above 6 lb. These permits are in force for a limited time only, and must be returned if not used. Dealers must keep accounts of their sales open to the inspection of the officers. The stock on hand is subject to their examination; and, if it does not correspond with the credit or quantity where-with they are chargeable, the dealers are liable in penalties.

Spirits may not be imported in casks under 60 gallons, except from the British colonies for private use; coffee, in quantities less than 112 lb.; and it may not be re-exported otherwise than in the original packages, or in quantities less than 4 C. except to Ireland, Cocoa paste and chocolate may not be imported. Chocolate must be manufactured in entered ware-houses, and put up in stamped papers, on payment of the inland duty. Cocoa-berries may not be sold in less quantities than 28 lb. at a time. Coffee from the plantations, accompanied with a certificate of the place of its growth, obtained on the oath of a planter, pays a smaller duty, and the parcels are marked with a particular stamp.

Rum, tea, coffee, and cocoa-berries, may be lodged in ware-houses under joint keys, on payment of the customs only; and delivered, when sold for home-consumption, on payment of the inland-duties, or for exportation, on bond being granted to send them abroad; and, if tea, to Ireland, or the colonies only. When rum is thus lodged, security must be given to pay the inland-duty when sold, or within 12 months if not sold. Accounts of the quantities of ware-housed goods are made up every 6 months, and the stock on hand examined.

Pepper may only be imported into London. It may be lodged in warehouses, under joint keys, upon payment of the half subsidy; the other duties to be paid when delivered for sale; and bond to be granted when delivered for exportation.

Spiceries, viz. cinnamon, cloves, mace, and nutmeg, may only be imported in British ships on license first obtained; the bale of cinnamon to weigh 70 lb. the cask of cloves, mace, or nutmeg, 300 lb. or upwards, unless from the East Indies.

Candles, soap, and starch, may not be imported, except

cept in packages of 224 lib. or upwards, openly stowed in the hold of the ship.

Hats and bonnets of bast straw, chip-cane, or horse-hair, in bales under 75 dozen, or materials for making such hats, in packages under 224 lib.

Oak-bark may not be imported when the price is under L. 10 per load, or L. 2. 10s. rindred bark.

Salt may not be imported otherwise than in bulk. Foreign salt, which is subject to a high excise, may be lodged in cellars, under joint keys, on payment of the customs only; and may be delivered from these cellars, upon bond, without payment of excise, if intended for curing fish of any kind, for exportation, or herrings for home consumption. These bonds are discharged, upon oath that the salt was applied to that purpose, and proof that suitable quantities of fish thus cured were exported, or of herrings entered for home-consumption, or that the salt perished at sea. Account is taken of the quantity on hand at the end of the fishing season; and, if there be any deficiency, the owners are liable in the penalty of 10s. per bushel. British salt may be taken in duty-free by ships bound on a fishing voyage to Ireland, or the north seas, under which the coasts of Scotland are comprehended, bonded and discharged as above.

|                 |       |                |            |             |             |            |
|-----------------|-------|----------------|------------|-------------|-------------|------------|
| Wheat under     | 48 s. | duty only 6 d. | on import. | under 44 s. | bounty 5 s. | on export. |
| Rye             | 32 s. |                | 3 d.       | 28 s.       |             | 3 s.       |
| Pease and beans | 32 s. |                | 3 d.       |             |             | no bounty. |
| Oats            | 16 s. |                | 2 d.       | 14 s.       |             | 24 s. 6 d. |
| Barley          | 24 s. |                | 2 d.       | 22 s.       |             | 2 s. 6 d.  |

And, when wheat is imported at the low duties, wheat-flour may be imported on payment of 2 d. *per* Cwt. When the prices are higher than those which entitle to bounty, exportation is prohibited, except for ship-provisions, and 2500 quarters to Gibraltar, 3500 to Minorca, and 500 to St Helena, all from London; 5000 to Jersey, &c. from Southampton; 2500 to the Isle of Man, from Whitehaven and Liverpool; 200 quarters flour, 15 tons bread and beans, in any quantity, to Africa; 200 quarters wheat, and other corn, in any quantity, to Hudson's Bay; 2000 quarters wheat, and other corn, in any quantity, to the West Indies, from London; and corn of all kinds to Ireland, when there is an embargo on the exportation from that country. Corn from Ireland may always be re-transported to Ireland.

Corn imported, when subject to the high duties, may be lodged in ware-houses till re-exported, or till the prices rise to the limit of importation on the low duties.

The prices of corn are ascertained in England by the quarter-sessions; in Scotland by the sheriffs, once in three months, viz. 1st February, May, August, and November, on the testimony of witnesses; and the rate then fixed regulates the corn-trade for the ensuing three months: But the liberty to export, and bounty on exportation, by 14 Geo. III. is regulated by the prices at the nearest market-town, and last market-day.

When barley is imported on payment of 2 d. duty, Indian maize may be imported on payment of 1 d.

Tobacco may not be imported, except in casks containing at least 450 lb.; and the duties on tobacco from the British colonies may be secured for 18 months except the old subsidy, or it may be lodged in ware-

houses of the following kinds are prohibited to be imported in foreign ships, or bought of foreigners out of foreign ships. Herring, cod, pilchard, salmon, ling, grill, mackerel, whittings, haddocks, sprats, sole-fish, gull-fish, congers, flat-fish, and all fresh fish except eels, stock-fish, anchovies, sturgeon, botargo, caviar, lobsters, and turbot.

The herring-fishery is allowed free to all his majesty's subjects. For encouragement, see SALT and FISHERY.

Corn. The object of the laws respecting the corn-trade is to encourage agriculture, by not only permitting the free exportation, but rewarding it with a bounty when the prices are low, and checking the importation by a heavy duty; and, to prevent scarcity, by prohibiting the exportation when the prices are high, and permitting importation at an easy duty. Various temporary laws have been enacted for these purposes, and sometimes other expedients employed in times of scarcity, such as prohibiting the distillery from corn, and manufacture of starch. The prices which duties on importation, and bounties on exportation, were fixed by a standing law, in 1773, are as follows:

houses, on the importer's bond, for 15 months. No drawback is allowed on re-exportation, except from the port where it was imported, and in the original packages: nor when manufactured in packages less than 300 lb. except cut or rolled. Tobacco from the British colonies must be attended with a manifest from the custom-house there, containing the quantities and marks, which must be delivered to the custom-house on the ship's arrival. Damaged tobacco, for which the proprietor refuses to pay duty, may be cut off, and burned, (but not tobacco stems); and, if the damage be occasioned by fires of weather at sea, or accident after the ship's arrival, the proprietor is allowed  $\frac{1}{2}$  d. *per* lb. not exceeding 30s. *per* hd. If, after cutting off what is damaged, the remainder be under 450 lb. it may be re-packed at the sight of the officer. No tobacco, except of the British colonies, that has been manufactured here, and paid the duties, may be consumed on board ships of war. Tobacco, removed by water, or by land, above 24 lb. or snuff, above 10 lb. must be attended with a certificate, and the packages must be marked with the kind of goods in large letters. Importers must deliver to the chief officers of the customs an account of the quantities sold or delivered out to be manufactured, and must deliver annually an account of all the tobacco that has been 18 months in their possession. Tobacco seized is to be burned, and the officers allowed 2 d. *per* lb. Tobacco stems may not be imported, and, if exported, are entitled to no drawback. Tobacco may not be planted in Britain, except in physic-gardens, in small quantities.

Linen, chequered, striped, printed, painted, stained, or dyed, and sail-cloth, must be marked with a stamp on payment of the duty. Linen printed, or sail-cloth manu-

manufactured at home, is marked with a different stamp. These stamps are cut off on re-exportation. Every new ship must be provided with a complete set of sails manufactured in Great Britain. If sails be purchased abroad during a voyage, the ship-master must report them, and pay duty on his arrival.

Wine may not be imported in casks containing less than 25 gallons, except from Tuscany in open flasks, and from the Levant, in flasks or bottles; and no French, Spanish, or Portuguese wine may be imported in casks less than hogheads. Wine imported into London, and Levant wine into Bristol and Southampton, pay higher duties; and, when carried to these places, must pay the extra-duties, and be attended with a certificate. Damaged wine may be delivered to the custom-house officers, who are to mix it with salt or vinegar; and it must be sold to be distilled into brandy, or made into vinegar; the price, not exceeding L. 4 for French or German wine, or L. 8 for any other, is given to the proprietor, the overplus paid into the customs.

To guard more effectually against clandestine trade, the importation of some articles is only permitted in ships of a certain burden, whose operations are not easily concealed. Spirits must be imported in ships of 100 tons, or upwards, except rum, and spirits of British plantations, which are only restricted to 70 tons; tea, tobacco, and snuff, 50 tons; salt, 40 tons. Tobacco and rum may not be exported in ships under 70 tons.

*Duties.* All goods imported are liable to duties, except such as are expressly exempted. The revenue of customs is of great antiquity in Britain, but was new modelled at the restoration of Charles II. A subsidy of tonnage on wines, and of poundage, or 1 s. per pound value of other goods, was granted during the king's life, and, after several prolongations, rendered perpetual. A book of rates was composed for ascertaining these values; and articles not rated pay duty according to the value, as affirmed upon oath, by the importer, except East India goods, which pay according to the value as sold at candle. If the goods be valued too low by the importer, the custom-house officer may seize them, upon paying to the proprietor the value he swore to, and 10 per cent. for profit; such goods to be sold, and the overplus paid into the customs. Another book of rates was published, under sanction of parliament, 11th George I. containing articles omitted in the former ones; and various additional duties have been imposed; some on all goods, some on particular kinds; some according to the rates, some unconnected with the rates; some with an allowance of certain abatements, some without any allowance; the greater part to be paid down in ready money, and a few for which security may be granted; often with variations, according to the ship's place, and circumstances of importation. The number of branches now amounts to upwards of 50; and sometimes more than 10 are chargeable on the same articles. By this means, the revenue of the customs has become a subject of much intricacy, especially to the officers, who must distinguish the different branches which are appropriated by law to different purposes.

Goods must be landed in lawful ports, between the hours of 6 and 6 in summer, and in day-light in winter.

ter, and in presence of an officer. Shipmasters must proceed directly to the place of unloading, and make report at the custom-house, upon oath, of the burden and lading of their ship. The proprietors may enter their goods within 20 days, by delivering to the collector five bills of entry, which contain a note of the kinds of goods, quantities, and packages, and paying the duties, or granting security, in cases where it is admitted. A warrant is then delivered to the land-waiter, to permit them to be landed; and they are examined, before removal, to try their correspondence, in quantity and quality, with the entry. If the merchant has entered too little, he is allowed to make a second or post-entry for the difference. If he has entered too much, he may obtain a return of the overplus, upon showing satisfactory reason for the over entry. If he be not acquainted with the quality of the goods, which is sometimes the case in consignments, he may obtain a warrant, called a *bill of sight*, for landing and inspecting them before entry, on depositing as much money as the duties will probably amount to. If the goods be damaged, the principal officers may appoint two skillful neutral persons, to ascertain the extent of the damage; and a proportional abatement is allowed in the duties. Goods not entered within 20 days may be carried to the custom-house, for security of the customs; and small parcels of fine goods sooner: such goods to be sold by auction, if not relieved in 6 months; and the overplus, after paying duty and charges, given to the proprietor. A ship may break bulk at any lawful port; and duty is only paid for the goods unloaded there; but, when it proceeds to another port, report must be made of the goods entered before. When all the goods are entered and unloaded, if the entries correspond with the shipmaster's report, he is entitled to certain allowances called *portage*, the ship is cleared, and the officers dismissed.

Goods taken out of a stranded ship are liable to the same duties, and entitled to the same draw-back, as goods regularly entered. Goods taken in, or put out at sea, within four leagues of the coast, except for a lawful reason declared at the first port of delivery, are forfeited, with penalties. Ships under 50 tons burden, hovering within two miles of the coast, may be compelled to give bond to proceed to foreign parts, otherwise the goods may be landed, and duties paid; or, if prohibited, forfeited. Goods taken and condemned as lawful prizes pay duty as other goods, and sometimes have been permitted, by temporary acts, to be ware-housed, or, though rated, to pay duty *ad valorem*. Prize military stores pay no duty. These bonds are relieved in the same manner as bonds for goods entitled to bounty or drawback.—Of which afterwards.

*Penalties.* The payment of duties, and observance of other laws, are enforced, by many penalties, against the owners of the goods, the shipmaster, the officers, and all accessories. Goods attempted to be landed clandestinely, or taken out at sea within four leagues of the coast; or found on board a ship after clearance, or not reported, and found on board concealed, though before clearance; and tea and spirits found on board hovering vessels, are forfeited. Sometimes the additional penalty of double or treble the value, sometimes



times a fixed sum, is incurred; porters, and others, assisting at running goods, are liable to fine and imprisonment; boats and carts employed are forfeited. Customable and prohibited goods, found in a boat, on the water, or bringing from the water-side, or found, by credible information, in any house, may be sent to the king's warehouse till claimed, and proof made that they have paid duty, or been bought in lawful trade; the *onus probandi* to lie on the claimer. Persons lurking near the sea to assist at running uncustomed goods, may be committed to the house of correction.

Shipmasters concurring in prohibited trade, or neglecting any of the forms prescribed by law, are liable to fines; and, in some cases, the ship is forfeited. Among the offences which subject to that penalty, are the following: Importing goods against the act of navigation, deals, or other prohibited goods, from Germany and the Netherlands; foreign fish; cattle, British and Irish salt, irregularly shipped, spirits in ships under 40 tons, spiceries, without delivering the license to the custom-house, or hops clandestinely; exporting coals clandestinely; exporting wool or tallow; permitting goods to be taken in or out at sea within four leagues of the coast; transgressing the privileges of the East-India or South-Sea Companies; neglecting the forms and regulations prescribed for trading to Ireland, and the colonies, of which afterwards; hovering ships, under 50 tons burthen. In some cases, the ships are appointed to be burned, unless they can be useful in his majesty's service. When the prohibition depends on the place of growth, the *onus probandi* lies on the defendant. Offences are cognizable by the court of exchequer, and often by the justices of peace, or commissioners of customs or appeals, by particular statutes.

Offences attended with violence are more severely punished. Persons employed in smuggling, wearing disguises, carrying arms, or resisting officers, are liable to transportation by several statutes; and by 9 Geo. II. any persons, three or more, carrying on illicit trade, or refusing seized goods or prisoners, or any persons so employed having their faces blacked or wearing a vizard mask or other disguise, and every person maiming, shooting, or dangerously wounding any officer in the execution of his duty, are to suffer death as felons. On the other hand, rewards are given to those who suffer in support of the revenue.

Counterfeiting stamps, or custom-house writings, is declared felony.

The duties payable by aliens are generally higher than by British, and they are excluded altogether from some branches of trade. See ALIEN.

*Goods duty-free.* The following goods may be imported duty-free:—Diamonds, pearls, and precious stones; flax, lintseed, linen rags, beaver-wool, wool for clothiers, and linen yarn unbleached. The following drugs for dyers, if regularly entered: Agaric, annatto, antimonium crudum, aquafortis, arsenic, bay-berries, Brazil wood, Braziletto wood, cochineal, cream-of tartar, sulsic, galls, gum-arabic, indigo, isinglass, litmus, logwood, madder, Nicorago wood, orchil, orchelia, or Spanish-weed, pomegranate pills, red-wood, saffore, sal ammoniac, sal gem, Japan wood, red Saunders, sumach, stick-lake, turnsole, vagonia, verdigrease.

The following goods from America: Wood and tim-

ber, cotton, wool, rice, fago, vermicelli, short silk, pig and bar iron, & ahes.

The following from Ireland: cattle, horses, butter, cheefe, beef, pork, mutton, hemp, raw calve-skins, thread, cotton, woollen or bay yarn, and woollen stuffs by licence.

Oil, whale-blubber, whale-fins, and skins, taken by ships employed in the British whale-fishery.

| Bounties on importation. From America.   |       | L. s. d. |
|--|-------|----------|
| Masts, yards, and boltsprits, per ton of 40 feet   | - - - | 1 - -    |
| Tar, per ton of 8 barrels  | - - - | 2 4 -    |
| — made from trees stripped a year before, according to certain directions, and certified | - - - | 4 - -    |
| Pitch and turpentine per ton, contained in 8 barrels                                     | - - - | 1 - -    |
| Hemp and flax per ton, till 1785   | - - - | 4 - -    |
| Raw silk, into certain ports, L. 100 value, till 1784                                    | - - - | 20 - -   |
| till 1791  | - - - | 15 - -   |
| Indigo, whose value is $\frac{1}{2}$ of the best French, per lib.                        | - - - | - - 6    |
| Staves, pipe staves of certain sizes, per 1200, till 1780                                | - - - | 2 - -    |
| hhd. staves per 1800, till 1780  | - - - | 2 - -    |
| barrel staves per 2400, ditto  | - - - | 2 - -    |
| heads per 3600, ditto  | - - - | 2 - -    |

Trees from Scotland, fit for masts, yards, and boltsprits, per ton - - - 1 00 00

Goods from the plantations, entitled to bounty, must be attended with a certificate concerning the place of their growth, and must be examined by the proper officers when loaded, whether they be good, merchantable, and otherwise suitable to the descriptions which entitle to bounty, and a certificate of their quality must be granted.

2. REGULATIONS CONCERNING EXPORTATION.] Goods of most kinds may be exported duty free, when regularly entered; and those that have paid duty on importation are generally entitled to draw-back of part, sometimes of the whole, when re-exported within three years, upon certificate that the duties were paid on importation, and oath of their identity. In some cases, a bounty is given on manufactured goods, when the materials from which they were manufactured have paid duty on importation; and manufactures subject to excise have generally the whole or part of the excise-duty returned. Some bounties are also granted, in favour of certain branches of trade, although they have not contributed, in any shape, to the revenue.

No goods, except fish, may be loaded for exportation, till the master has entered his ship outwards. The exporter must make out four bills of entry, and deliver them to the collectors, and pay down the duties, if any be due. Upon this he receives a cocket, certifying the entry and payment, and then may ship the goods in presence of the searcher, who certifies the quantity on the back of the cocket. When all the goods are shipped, the shipmaster goes to the custom-house, and makes report, upon oath, concerning the burthen, property, and crew, of his ship, and the goods

goods on board, which are inserted in the report, from the indorsements on the coquets. He then receives his coquets, and is cleared outward. If more goods be afterwards taken in, they may be added to the report. If the ship proceeds to any other port, to take in more goods, the must take out a new clearance at each port, and must specify the goods taken in at the former ones.

Goods liable to duty, shipped before entry, or goods prohibited to be exported, are forfeited. If it be proven that goods have been clandestinely exported, the proprietors forfeit double value.

Goods intitled to bounty or drawback, or prohibited to be consumed, may be examined before or after shipping, and, if found less in quantity, or different in quality, from what they were entered for, they are forfeited, with penalties. Bonds are taken, in case of bounties, and in some cases of drawbacks, that the goods shall not be re-landed in Great-Britain, the dangers of the seas excepted. These bonds are relieved by certificate from the magistrates of the place where they are unloaded, or of a British consul, or two creditable British merchants, or by proof that they were lost at sea. In case of exportation to Ireland, they are relieved by certificate from the custom-house, at the port of delivery there.

Debentures are made out at the custom-house for the drawbacks and bounties. These contain a declaration of the exporter concerning the quantities and kinds of goods, and circumstances that entitle them to bounty, taken on oath, before the principal officers; a certificate by the officers on duty, that the goods were shipped in conformity, and the ship legally navigated; an intimation that an oath or bond has been taken, not to re-land them; and a note of the amount of the bounty or drawback. The collector of the customs may pay the bounty himself, if he has money in his hands pertaining to the fund from which it is appointed to be paid. If otherwise, he certifies the same to the commissioners of the customs, who order payment in course. Goods sent to Ireland receive no drawback, till certificates be returned of their being landed there.

*Goods prohibited to be exported.* White ashes, horns, unwrought hides of black cattle, (except calfskins dressed with the hair,) tallow, clocks, watches, cases, and dial-plates, unless fit for use, with the maker's name; coin without the king's license, (except foreign coin, upon license); bullion, unless certificate be produced that it is not molten from British coin or plate. These metals: brass, copper, latten, bell-metal, pan-metal, gun-metal, and shruft-metal, (except lead and tin, or copper and mundic, made of British ore, and foreign copper in bars. Gun-powder, when the price exceeds 5 l. per barrel. Engines for knitting stockings; tools and utensils for cotton, linen, woollen, and silk manufactures. Wool, sheep, wool-fells, mortlings, shortlings, woollen-yarn, wool-flocks; slight manufactures of wool that may be reduced to wool again; fuller's earth, fulling clay, and tobacco-pipe clay.

The woollen manufacture is considered as the most important, and is highly favoured by our laws. The exportation of the materials is therefore declared a common nuisance, and prohibited under very strict re-

gulations and severe penalties. Wool may not be carried by land, except in the day-time, having the word WOOL marked on each package; it may not be shipped coalwise, except on license previously obtained; and it must be entered at the custom house before it be brought within five miles of the sea-shore, and bond must be granted to re-land it in Britain, which can only be discharged by certificate from the port of delivery. The penalties for exporting wool are, forfeiture of ship and cargo, with treble value, and three years imprisonment. If wool exported be not discovered, the inhabitants of the place are liable for treble value. In Kent and Suffex, the shearers of wool, within 10 miles of the sea, must give notice to the officer of the number of fleeces, and part where lodged, within three days, and it cannot be removed without a permit. Purchasers of wool, within 15 miles of the sea, must give security to sell it in the inland country, or manufacture it themselves; and wool carried within 15 miles of the sea, without being entered, is forfeited, with high penalties. Armed vessels are appointed to cruise at proper stations, to search all ships suspected of exporting wool. Most of these regulations extend to wool, fells, &c. Exporting sheep is punished with the loss of the left-hand for the first offence, and with death for the second. The following articles are excepted from the prohibition: Lamb-skins ready dressed, limited quantities from Southampton to Jersey, &c.; wool-fells and wedders for ships use; foreign wool may be re-exported, but in British ships only. White woollen cloths pay duty on exportation; but dyed cloths, and other woollen manufactures, are exported duty-free.

|  |                     |
|--|---------------------|
| <i>Bounties on Goods exported.</i> Refined sugar     | L. s. d.            |
| manufactured in Great-Britain from                   |                     |
| brown sugar of the colonies, per C.                  | — 9 —               |
| Corn. See p. 4142.                                   |                     |
| Sail-cloth, British-made, per yard                   | — — 2               |
| Linen, British, or Irish, 24 inches broad,           |                     |
| or upwards, under 5 d. per yard                      | — — $\frac{1}{2}$   |
| — from 5 d. to 6 d.                                  | — — 1               |
| — from 6 d. to 1 s.                                  | — — 2               |
| Chequered linen, 25 inches broad, not                |                     |
| exceeding 1 s. 6 d. nor under 7 d.                   | — — $\frac{1}{2}$   |
| Diaper, not exceeding 1 s. 6 d.                      | — — 1 $\frac{1}{2}$ |
| But printed linen has no bounty.                     |                     |
| Silk stuffs of British manufacture, and silk         |                     |
| ribbons, per lb.                                     | — 3 —               |
| Ditto, mixed with gold and silver                    | — 4 —               |
| Ditto, of silk and Gogran yarn                       | — — 8               |
| Ditto, mixed with cotton                             | — 1 —               |
| Ditto, mixed with worsted                            | — — 6               |
| But mixed stuffs must have at least $\frac{1}{3}$ of |                     |
| the warp silk, and the value must be                 |                     |
| double the bounty.                                   |                     |
| Silk stockings, gloves, fringes, laces, and          |                     |
| sewing silk  | — 1 3               |
| Gold thread, lace, or fringe, per lb.                | — 6 —               |
| Silver ditto   | — 5 —               |
| Cordage, not of American hemp, exported              |                     |
| to foreign places in Europe, per C.                  | — 2 4 $\frac{1}{2}$ |
| Gun-powder, per barrel, qt. 1 C.                     | — 4 6               |
| Spirits from barley, malt, or other corn,            |                     |
| when barley is under 24 s. per qr. (be-              |                     |
| sides drawback of excise) per ton                    | — 10 —              |

|  |   |     |
|--|---|-----|
| Flesh and fish, viz.                                 |   |     |
| Beef and pork, per barrel                            | — | 5 — |
| Pilchards or scads, per cask of 50 gallons           | — | 7 — |
| Cod, ling, and flake, 14 inches and upwards, per 100 | — | 5 — |
| — wet, the barrel of 32 gallons                      | — | 7 — |
| — dried, called haberdines, per C.                   | — | 3 — |
| Salmon, per barrel of 42 gallons                     | — | 4 6 |
| White herrings, per barrel of 32 gallons             | — | 2 8 |
| Full red-herrings, per ditto                         | — | 1 9 |
| Clean shotten red-herrings, per ditto                | — | 1 — |
| Dried red sprats, the last                           | — | 1 — |

The following bounties are also granted on ships employed at the fisheries:

*Herring-Fishery.* Decked vessels, from 20 to 80 tons, taking on board 12 bushels of salt for each last, and 6 men for every 20 tons, repairing to Yarmouth, Whitehaven, Leith, Inverness, Brailley-found, Campbelltown, Oban, or Kirkwall, from 22 June to 24 October, granted 1771, for seven years, and to the end of the then next session of parliament; 30 s. per ton.

*Newfoundland Cod-fishery.* Vessels of 50 tons, or upwards, manned with 15 men, catching 10,000 fish, landing at Newfoundland, and making another trip, and returning to the same port with another cargo; granted 1775, for 11 years;

|                        |           |
|------------------------|-----------|
| First 25 vessels, each | L. 40 — — |
| Next 100 vessels, each | 20 — —    |

*Whale-Fishery.* In Greenland seas, Davis's Straits, and parts adjacent, a bounty granted 1771, of 40 s. per ton to 1776, 30 s. to 1780, and 20 s. to 1787, on ships of 200 tons, carrying 28 men, besides the master and surgeon, six months provisions, four boats, 20 harpoon-irons, and 40 lines of 120 fathoms; and, for every 50 tons more, one boat, six men, and 10 lines, and taking one apprentice for every 50 tons. These ships must continue at the fishing till 10th August, unless their loading be completed sooner, and must belong entirely to the place where fitted out. No bounty is allowed for more than 400 tons on one ship.

A bounty was granted in 1775, to continue 11 years, for encouraging the whale-fishery on the coast of Newfoundland and Labrador, the river St Lawrence, and bay of Chaleur. The five ships that take the greatest quantity of blubber, being equipped as for the Greenland fishery, are entitled to the following sums:

|                         |   |        |
|-------------------------|---|--------|
| First greatest quantity | — | L. 500 |
| Second                  | — | 400    |
| Third                   | — | 300    |
| Fourth                  | — | 200    |
| Fifth                   | — | 100    |

A like bounty was granted in 1776, to continue for the same term of years, in favour of the whale-fishery on the American coast, south of latitude 44°. The ships employed in these fisheries to be British-built, manned by  $\frac{3}{4}$  British subjects, belonging to subjects residing in Britain or Ireland, and must take one apprentice for every 50 tons.

When naval stores are imported on bounty, or iron from America, duty-free, pre-emption must be offered to the commissioners of the navy.

3. Regulations COASTWISE.] The coasting trade may only be carried on by British ships legally navigated; and ships foreign built, though belonging to British subjects, are liable to a duty of 5s. per ton.

Goods carried coastwise must be attended with a coast cocquet or suffrage; and goods imported from foreign places, and afterwards shipped coastwise, must be accompanied with a certificate, containing a description of their quantity, quality, and value, which must be delivered to the custom-house at the port of discharge, that the officers may examine if they correspond. Such goods, not attended with a certificate, or not taken in at the place where certified, are forfeited. Upon deliverance of the certificate, a warrant is granted for landing them. Foreign goods, taken at sea, or at any other port than that from which certified, are forfeited. Bond must be granted by the shipmaster to deliver the goods at some British port, and return certificate within six months.

4. EAST INDIES.] Goods from India must be landed in Britain, without breaking bulk; and, when a ship sails for India, bond must be granted for that purpose, and the goods must be publicly sold by inch of candle. Private traders, without the licence, are liable to heavy penalties. Goods reshipped from homeward bound Indiamen before their arrival, or put on board outward bound ones after their departure, are forfeited with treble value.

British subjects are prohibited, under high penalties, from taking any concern in foreign East India companies.

The company may export ammunition for their own defence, duty free, not exceeding L. 300 in duty per annum.

They may import, on licence, for the African trade, coarse printed calicoes, cowries, and arragoes; and, if they do not supply the market, the treasury may grant licence to others.

5. IRELAND.] The commercial laws of Britain, with regard to Ireland, impose certain restrictions, but, on the other hand, establish many privileges which are not extended to foreign nations.

A petition was presented by parliament to king William, requesting him to discourage the woollen manufacture of Ireland, as interfering with the British, and to encourage the linen manufacture there. On the principle of that petition, many of the following regulations have been enacted.

Ships built in, or belonging to Ireland, have the same freedom of trade, by the act of navigation, as those of Britain. Irish beef, pork, cattle, butter, cotton-yarn manufactured there, hemp, flax, and manufactures thereof, may be imported into Britain duty free; and various articles, formerly enumerated, may be imported, which are prohibited from other places. The bounties on the whale-fishery extend to that country. The same draw-backs are generally allowed for goods exported there as to foreign countries; and it is permitted to export 30 tons of gum-senaga annually duty free.

All Irish goods, except woollen and cotton manufactures, glass, hops, gun-powder, and oils, and all British goods from Ireland, except woollen manufactures and glass, may be exported from Ireland or America, but this permission does not extend to any goods which



which pay duty in Britain, till an equal duty be laid on by the Irish parliament: nor to bar-iron, and iron-ware, till subjected to duties; bar-iron L. 2, 10s. and slit-iron L. 3, 3s. per ton; nor to goods which have any bounty on exportation from Ireland.

Provisions, lines, and nets, for Newfoundland fishery, and clothing and accoutrements for the forces in Irish pay in America, may be exported from Ireland.

On the other hand, wrought silks, muslins, and calicoes, of Persia, or the East Indies, and the enumerated goods and sugars of the British plantations, spirits and molasses of foreign plantations, and hops and glass, may only be imported from Britain. Hops receive no drawback on exportation there. Glass of British manufacture only is permitted to be imported, and it may not be re-exported.

Wool, and woollen manufactures, might not be exported from Ireland, except to Britain; and woollen manufactures might only be exported from certain ports in Ireland, to certain ports in the west coast of England, on licence previously obtained.

These restrictions, however, were considered by the Irish as very oppressive; and accordingly, after many complaints, an act was passed in their favour, which received the royal assent on the 23d of December 1779. This act repealed part of that of 10 and 11 Wil. III. ("to prevent the exportation of wool out of the kingdoms of Ireland and England into foreign parts, and for the encouragement of the woollen manufacture in the kingdom of England,") and so much of any other act or acts of parliament made in Great Britain, which prohibit, or in any manner restrain, the exportation of cloth, bays, kerseys, fays, friezes, druggets, cloth-ferges, shalloons, or any other drapery-stuffs or woollen manufactures whatsoever, made up or mixed with wool or wool-flocks, from the kingdom of Ireland into foreign parts; also so much of an act 29 Geo. II. ("for granting to his majesty several rates and duties, and for obviating some doubts about making out orders at the exchequer for the moneys advanced upon the credit of the salt-duties granted and continued to his majesty by an act of the last session of parliament") as relate to the exportation of glass, glass-bottles, or glass of any kind or denomination whatever, from or out of the kingdom of Ireland.

6. COLONIES.] The establishment of colonies may prove beneficial, in various respects, to the mother-country. They supply us with commodities which cannot be produced at home; they afford employment and subsistence to our supernumerary hands; they open new markets for our manufactures; and increase the number of our shipping and seamen. When their territories are extensive and fertile, they must increase in population and riches; and, if the connection can be preserved, will promote the strength of the nation, by contributing to its forces and revenue, for the common benefit. See COLONY.

When a colony is first established, agriculture is the natural employment of the settlers. Their lands are generally uncultivated, and thinly inhabited; and their industry is exerted to its best advantage in the production of commodities that yield a price in Europe, and are exchanged for manufactures already brought to perfection there. Such will be the state of things at first, though no restrictions be interposed. The Bri-

tish legislature has attempted to prolong this kind of intercourse beyond its natural period. Desirous to possess the whole advantages of their trade, and jealous of the favourite woollen manufacture, we have imposed many restrictions on their commerce, and some on their manufactures; but, in return, besides the benefit of protection, we have encouraged the staple articles of their produce, by various bounties and privileges.

The duties and commercial restrictions imposed on the colonies, have furnished an offensive cause for the revolt of America. As these laws are still observed in the colonies subject to Britain, and require to be stated, in order to direct our judgment how far the grievances complained of by the revolted colonies were well founded, we have drawn out the following abstract:

No goods may be imported into, or exported from the plantations in Asia, Africa, or America, except in ships built in Britain, Ireland, or the plantations, or prize-ships, manned by British subjects, duly registered, and legally navigated.

The following goods, enumerated in the act of navigation, and subsequent acts, may not be exported from the plantations, except to some other plantation, or to Europe: tobacco, cotton wool, indigo, ginger, fustic and other dyeing woods, molasses, hemp, copper ore, beaver-skins and other furs, pitch, tar, turpentine, masts, yards, and boltspits, coffee, pyment, cocoa nuts, whale-fins, raw-silk, pot and pearl ashes. Rice and sugars are enumerated in the list, but are now under different regulations.

Rice may be shipped in Carolina, Georgia, and Florida, directly for places south of Cape Finislerre, upon licence taken out in Britain, bond being granted that none of the other enumerated goods will be taken in, and that the ship will proceed directly with the rice, according to the licence, and return to Europe before it goes again to the plantations. The quantities of rice are indorsed on the licence, and the half-subsidy paid in Britain by the person who grants the bond, on a return of the quantity transmitted from America. The master, on his return, must produce a certificate from the British consul, or two creditable merchants, that the rice was delivered, and no other enumerated goods on board.

Sugar may be sent to foreign countries, without being landed in Britain, the major part of whose owners reside in Britain, and the rest in the colony, upon licence taken out in Britain, and bond granted that no enumerated goods shall be laden. If the sugar be destined for places north of Cape Finislerre, the ship must touch at Britain, and make entry of its cargo; but need not be unloaded, unless fraud be suspected. If its destination be south of Cape Finislerre, it may proceed directly; but the ship must return to Europe within 8 months after unloading, and before making another voyage to the plantations; and the master must produce a certificate of the landing of the sugar, and make entry of the quantity, but without payment of any duty.

Iron may not be imported to Europe, except to Ireland; and none of the non-enumerated may be imported to any country south of Cape Finislerre, except the bay of Biscay.

When a ship sails from Britain to the colonies, bond must be granted, to the extent of L. 1000 if under

100 tons burden, and L. 2000 if above it; that, in case it take in any of the enumerated commodities, it will proceed directly to Britain, or some other plantation; and, in case it takes in non-enumerated commodities, it will proceed to places where these goods may be lawfully exported, and return certificate of their delivery within 18 months. When ships arrive at the colonies from other places, a like bond must be granted to the governor.

No European goods may be imported into the colonies from any other place than Britain, except wine from Madeira and the Azores, belonging to the British, salt for the fisheries, and goods that are permitted from Ireland.

Vessels hovering on the coasts of the plantations, without coquets, and foreign vessels, are forfeited.

The following is a table of the British duties payable in the colonies:

|   | L. s. d.            |
|---|---------------------|
| Foreign white sugar imported, per Cwt.            | 1 2 —               |
| Foreign sugar and pannelles, per Cwt.             | — 5 —               |
| Foreign indigo, per lb.                           | — — 6               |
| Foreign rum, or spirits, per gallon               | — — 9               |
| Madeira wine, per ton                             | 7 — —               |
| Spanish and Portugal wine, per ton                | — 10 —              |
| Molasses, British or foreign, per gall.           | — — 1               |
| Coffee, from colony to colony, per Cwt.           | — 7 —               |
| Pimento do. per lb.                               | — — — $\frac{1}{2}$ |
| Tobacco do. per lb.                               | — — — $\frac{1}{2}$ |
| Indigo do. per lb.                                | — — 2               |
| Logwood do. per Cwt.                              | 5 — —               |
| Other dying wood, from colony to colony, per Cwt. | — 10 —              |
| Ginger do. per Cwt.                               | — 1 —               |
| Cocoa nuts do. per lb.                            | — — 2               |

Foreign indigo, and cotton wool, may be imported to the West Indies duty free.

Duties on glass, tea, paper, and painter's colours, were imposed in 1767, and all repealed, except 3 d. per lb. on tea, which gave occasion for those disturbances that have produced the present unhappy separation.

The whole of the old subsidy is generally retained on goods exported to America. One half thereof is generally drawn back on goods exported to other places.

The colonies are prohibited to erect slit mills, to export wool or woollen manufactures, or transport them by sea from one colony to another, and to transport hats, by sea or land-carriage, from one colony to another.

In return for these duties and restrictions, the colonies are favoured with various mercantile privileges. Many of their commodities are admitted into Britain duty free; and almost all of them on easier duties than from foreign countries. Bounties are granted on their naval stores, indigo, and silk. Large sums have been granted for their establishment, and continue to be granted in favour of those whose circumstances require it. And the planting of tobacco is severely prohibited in Britain, that theirs may be without a rival.

The general policy of Britain, in confining the advantages granted to the colonies, to the encouragement of their produce only, has, in one instance, been

dispensed with. Dominica [late taken by the French], and Jamaica, being conveniently situated for trading to the French West Indies and the Spanish main, free ports have been opened for that purpose, and the restrictions of the act of navigation, in some measure, relaxed.

Cattle, and all goods of foreign plantations, might be imported into the free ports of Dominica, in foreign ships not having more than one deck, except tobacco, coffee, cocoa, and manufactures.

The following goods from the British plantations might not be imported into Dominica; copper-ore, cotton, wool, ginger, fustic, dyeing-wood, hemp, indigo, molasses, beaver skins, sugar, coffee, cocoa, hides, skins, pot and pearl ashes, raw silk, and whale-fins.

Negroes imported in British ships, and all other British or plantation goods, legally imported, may be exported in foreign one-decked vessels, except tar, turpentine, and tobacco; but cotton, wool, and other enumerated goods, must be imported to Britain, according to the act of navigation.

No vessels with West Indian produce, except live cattle, may proceed from Dominica to the other West Indian islands; and no European, nor East India goods, may be exported from thence to the British plantations; nor any American produce liable to duty, without certificate that it is the produce of that island. Dominica timber might be exported, subject to the regulations of the act of navigation.

Sugars might be imported from Dominica for re-exportation, and ware-housed, on payment of 3 d. per cwt. duty; and other goods, on payment of half old subsidy, not drawn back, to be re-exported in ships of 70 tons.

American goods from Dominica, except certified to be the produce of that island, paid French duties.

Foreign plantation goods may be imported into the free ports in Jamaica, except sugar, coffee, pimento, molasses, ginger, tobacco, and manufactures.

**Mercantile Laws.** The laws relating to commercial and maritime affairs approach nearer to uniformity through the different countries of Europe, than those on other subjects. Some of the fundamental regulations have been taken from the Roman law; others have been suggested by experience, during the progress of commerce; and the whole have been gradually reduced to a system, and adopted into the laws of trading nations, but with some local varieties and exceptions.

The British legislature has enacted many statutes respecting commerce; yet, the greater part of our mercantile law is to be collected from the decisions of our courts of justice, founded on the custom of merchants. A proof of such custom, where no direct statute interferes, determines the controversy, and becomes a precedent for regulating like cases afterwards. The existence of a custom not formerly recognized, is, in England, determined by a jury.

The most common mercantile contracts are those between buyer and seller; between factor and employer; between partners; between the owners, masters, mariners, and freighters of ships; between insurers and the owners of the subject insured; and between the parties

time parties concerned in transacting bills of exchange. See  
 Laws. FACTORAGE, SALE, PARTNERSHIP, INSURANCE, BILL,  
 &c. and the next article.

**Maritime Laws.** The most ancient system of maritime laws is that of Rhodes, which was in force during the time of the Grecian empire, and afterwards incorporated into the Roman law. Although, in some parts, not applicable to the present state of trade, and, in others, now hardly intelligible, it contains the ground-work of the most equitable and beneficial rules observed in modern commerce. A like system was set forth by Richard I. of England, called the *Statutes of Oleron*; and another, by the town of Wisby, in the island of Gothland. From these systems, improved and enlarged in the course of time, our general maritime law is derived. The jurisdiction of matters purely maritime belongs, in England, to the court of admiralty, which proceeds on the civil law; but their proceedings are subject to the controul, and their decisions to the review, of the superior courts.

We shall here consider, the obligations which subsist between the masters or owners of ships, the freighters, the mariners, and the furnishers of provisions or repairs.

1. *Masters and Freighters.* A charter-party is a contract between the master and freighters, in which the ship and voyage is described, and the time and conditions of performing it are ascertained.

The freight is most frequently determined for the whole voyage, without respect to time. Sometimes it depends on the time.

In the former case, it is either fixed at a certain sum, for the whole cargo; or so much per ton, barrel-bulk, or other weight or measure; or so much per cent. on the value of the cargo. This last is common on goods sent to America; and the invoices are produced to ascertain the value.

The burden of the ship is generally mentioned in the contract, in this manner, *one hundred tons, or there-by*; and the number mentioned ought not to differ above 5 tons, at most, from the exact measure. If a certain sum be agreed on for the freight of the ship, it must all be paid, although the ship, when measured, should prove less, unless the burden be warranted. If the ship be freighted for transporting cattle, or slaves, at so much a head, and some of them die on the passage, freight is only due for such as are delivered alive; but, if for *loading* them, it is due for all that were put on board.

When a whole ship is freighted, if the master suffers any other goods besides those of the freighter to be put on board, he is liable for damages.

It is common to mention the number of days that the ship shall continue at each port to load or unload. The expression used is, *work weather days*; to signify, that Sundays, holidays, and days when the weather stops the work, are not reckoned. If the ship be detained longer, a daily allowance is often agreed on, in name of *demurrage*.

If a ship be freighted by the month, the time that the freight commences may be mentioned in the contract, otherwise it is computed from the time it begins to load.

If the voyage be completed in terms of the agree-

ment, without any misfortune, the master has a right to demand payment of the freight, before he delivers the goods. But if the safe delivery be prevented by any fault or accident, the parties are liable, according to the following rules:

If the merchant does not load the ship within the time agreed on, the master may engage with another, and recover damages.

If the merchant loads the ship, and recalls it after it has set sail, he must pay the whole freight; but, if he unloads it before it sets sail, he is liable for damages only.

If a merchant loads goods which it is not lawful to export, and the ship be prevented from proceeding on that account, he must pay the freight notwithstanding.

If the shipmaster be not ready to proceed on the voyage at the time agreed on, the merchant may load the whole, or part of the cargo, on board another ship, and recover damages; but chance, or notorious accident, by the marine law, releases the master from damages.

If an embargo be laid on the ship before it sails, the charter-party is dissolved, and the merchant pays the expence of loading and unloading; but, if the embargo be only for a short limited time, the voyage shall be performed when it expires, and neither party is liable for damages.

If the ship be disabled, by any accident, from completing the voyage, without any fault in the master, he may load the goods on board another ship, to the port of destination, with consent of the owner; and, if that consent be refused, he is entitled to freight on the goods landed at the port he is forced into, or he may repair his ship, if it can be done within a short time, (within 3 days at most, according to the laws of the Hanse towns), and proceed. If he do not carry the goods to the port of destination, he is entitled to freight, *pro rata*, in proportion to the part of the voyage performed; and the proportion is determined by comparing the number of days he sailed before the accident, with the number in which he might probably have completed the voyage. [Locke, *et alii*, against Lyde, Mich. term, C. B. 33. Geo. II.]

If the shipmaster fails to any other port than that agreed on, without necessity, he is liable for damages; if thro' necessity, he must fail to the port agreed on, at his own expences.

If a ship be taken by the enemy, and re-taken or ransomed, the charter-party continues in force.

If the master transfers the goods from his own ship to another, without necessity, and they perish, he is liable for the value; but if his own ship be in imminent danger, the goods may be put on board another ship, at the risk of the owner.

If a ship be freighted out and home, and a sum agreed on for the whole voyage, nothing is due till it return; and the whole is lost, if the ship be lost on the return.

If a certain sum be specified for the homeward voyage, it is due, although the factor abroad should have no goods to send home.

In the case of a ship freighted to Madeira, Carolina, and home, a particular freight fixed for the homeward

Maritime  
 Laws.



ward voyage, and an option reserved for the factor at Carolina to decline it, unless the ship arrived before 1st of March; the shipmaster, foreseeing he could not arrive there within that time, and might be disappointed of a freight, did not go there at all. He was found liable in damages, as the obligation was absolute on his part, and conditional only on the other.

If the goods be damaged without fault of the ship or master, the owner is not obliged to receive them and pay freight, but he must either receive the whole, or abandon the whole; he cannot choose those that are in best order, and reject the others. If the goods be damaged through the insufficiency of the ship, the master is liable for the same; but, if it be owing to stress of weather, he is not accountable. It is customary for shipmasters, when they suspect damage, to take a *protest against wind and weather* at their arrival. But, as this is the declaration of a party, it does not bear credit, unless supported by collateral circumstances.

If part of the goods be thrown over-board, or taken by the enemy, the part delivered pays freight.

The shipmaster is accountable for all the goods received on board, by himself or mariners, unless they perish by the act of God, or of the king's enemies. Though they should be seized by an armed rabble, he is liable: on this principle, that, otherwise, he might defraud the public, by combining with thieves, and the security of commerce would be destroyed.

Shipmasters are not liable for leakage on liquors; nor accountable for the contents of packages, unless packed and delivered in their presence.

Upon a principle of equity, that the labourer is worthy of his hire, differences arising with regard to freight, when the case is doubtful, ought rather to be determined in favour of the shipmaster.

2. *Ship and Owners with Creditors.* When debts are contracted for provisions or repairs to a ship, or arise from a failure in any of the abovementioned obligations, the ship and tackle, and the owners, are liable for the debt, as well as the master. The ship and tackle may be condemned by the court of admiralty; and the owners may be sued at common law.

By the mercantile law, the owners are liable in all cases, without limitation; but, by statute, they are not liable for embezzlement beyond their value of ship, tackle, and freight.

A shipmaster may pledge his ship for necessary repairs during a voyage: and this hypothecation is implied, by the maritime law, when such debts are contracted. This regulation is necessary, and is therefore adopted by all commercial nations; for, otherwise, the master might not find credit for necessary repairs, and the ship might be lost. If repairs be made at different places, the last are preferable.

The relief against the ship is competent to the court of admiralty in England, only when repairs are furnished during the course of a voyage; for the necessity of the case extends no further. If a ship be repaired at home, (e. g. upon the river Thames), the creditor is only entitled to relief at common law.

The creditor may sue either the masters or owners;

but, if he undertook the work on the special promise of the one, the other is not liable.

If the master buys provisions on credit, the owners are liable for the debt, tho' they have given him money to pay them.

If a ship be mortgaged, and afterwards lost at sea, the owners must pay the debt; for the mortgage is only an additional security, tho' there be no express words to that purpose in the covenant.

If a ship be taken by the enemy, and ranomed, the owners are liable to pay the ransom, tho' the ransomer die in the hands of the captors.

3. *Owners and Mariners.* If a ship be lost before it comes to a port of delivery, the seamen lose all their wages; and, if lost afterwards, they lose their wages from the last port of delivery. If they run away, they lose all. In a voyage to the Newfoundland fishery, and from thence with the cargo to Europe, the port of destination in Europe is reckoned the first port of delivery. In a voyage to the East Indies, and home, the ship being lost on the return, the seamen were found entitled to their wages for the voyage outward, and half the time of loading and unloading.

The master may retain the seamen's wages to reimburse himself for damage sustained by their default.

Shipmasters going to foreign places must make an agreement with the mariners, (except apprentices,) in writing; and they are liable in penalties if they desert or refuse to proceed. Their wages must be paid within a month after their arrival, or when dismissed.

4. *Owners of the ship with each other.* By the common law of England, a few of the owners have a right to stop a voyage which the major part propose. By the laws of the admiralty, they cannot stop the voyage, but may compel the owners to give their stipulation for the safe return of the ship, and sue thereon, if it be lost.

5. *Owners of ship and cargo with each other.* There is a mutual obligation which subsists between all the owners of a ship and cargo. In time of danger, it is often necessary to incur a certain loss of part for the greater security of the rest; to cut a cable; to lighten the ship, by throwing part of the goods over-board; to run it ashore; or the like: and, as it is unreasonable that the owners of the thing exposed for the common safety should bear the whole loss, it is defrayed by an equal contribution among the proprietors of the ship, cargo, and freight. This is the famous *Lex Rhodia de jactu*, and is now called a *general average*.

The custom of valuing goods which contribute to a general average, is not uniform in all places. They are generally valued at the price they yield at the port of destination, charges deducted; and goods thrown over-board are valued at the price they would have yielded there. Sailors wages, cloaths and money belonging to passengers, and goods belonging to the king, pay no general average; but proprietors of gold and silver, in case of goods being thrown over-board, contribute to the full extent of their interest.

The following particulars are charged as general average: Damage sustained in an engagement with the enemy; attendance on the wounded, and rewards given for service in time of danger, or gratuities to the widows or children of the slain; ransom; goods given

to the enemy in the nature of ransom; charges of bringing the ship to a place of safety when in danger from the enemy, or waiting for convoy; charges of quarantine; goods thrown over-board; masts or rigging cut; holes cut in the ship to clear it of water; pilotage, when a lake is sprung; damage, when voluntarily run a-ground, and expence of bringing it afloat; goods lost by being put in a lighter; the long-boat lost in lightening the ship in time of danger; hire of cables and anchors; charges of laying in ballast, victualling, and guarding the ship when detained; charges at law, in reclaiming the ship and cargo; interest and commission on all these deburcements.

Though goods put on board a lighter, and lost, are charged as a general average; yet, if the lighter be saved, and the ship with the rest of the goods be lost, the goods in the lighter belong to their respective proprietors, without being liable to any contribution.

If part of the goods be plundered by a pirate, the proprietor or shipmaster is not entitled to any contribution.

The essential circumstances that constitute a general average are these: The loss must be the effect of a voluntary action; and the object of that action the common safety of the whole. Quarantine, which is allowed, seems not to fall within this description.

6. *Owners and Re-captors.* When a ship is taken and carried *infra presidia hostium*, and remains there for 24 hours, it has been held, by the maritime law, that the property was completely vested in the enemy; and, if afterwards re-taken, the property did not return to the former owners, but remained with the recaptors. But it is otherwise determined by the British statute.

If it be re-taken by the king's ships, it shall be restored to the former owners, on paying one eighth part of the value for salvage. If re-taken by a private ship within 24 hours, it shall pay an eighth part; if within 48 hours, a fifth part; if within 96 hours, a third part; and if above 96 hours, a half.

Those who rescue a ship or goods from any hazard, are entitled to a reasonable allowance, in name of salvage; and may retain what they have saved till the salvage be paid.

7. *Quarantine.* See QUARANTINE.

8. *Wrecks.* See WRECK.

9. *Impress.* See IMPRESSING.

10. *Insurance.* See INSURANCE.

Game-Laws. See the article GAME.

Sir William Blackstone, treating of the alterations in our laws, and mentioning franchises granted of chase and free warren, as well to preserve the breed of animals, as to indulge the subject; adds, "From a similar principle to which, though the forest-laws are now mitigated, and by degrees grown entirely obsolete; yet from this root has sprung a *bastard slip*, known by the name of the *game-law*, now arrived to and waning in its highest vigour: both founded upon the same unreasonable notion of permanent property in wild creatures; and both productive of the same tyranny to the commons: but with this difference, that the forest-laws established only one mighty hunter throughout the land; the *game-laws* have raised a little Nimrod in every manor. And in one respect the ancient law was much less unreasonable than the modern;

for the king's grantee of a chase or free-warren, might kill game in every part of his franchise; but now, though a freeholder of less than L. 100 a-year is *forbidden to kill partridge upon his own estate*, yet nobody else (not even the lord of the manor, unless he hath a grant of free warren) can do it without committing a trespass and subjecting himself to an action."

Under the article GAME, the destroying such beasts and fowls as are ranked under that denomination, was observed (upon the old principles of the forest-law) to be a trespass and offence in all persons alike, who have not authority from the crown to kill game (which is royal property) by the grant of either a free warren, or at least a manor of their own. But the laws called the *game-laws* have also inflicted additional punishments (chiefly pecuniary) on persons guilty of this general offence, unless they be people of such rank or fortune as is therein particularly specified. All persons therefore, of what property or distinction soever, that kill game out of their own territories, or even upon their own estates, without the king's licence expressed by the grant of a franchise, are guilty of the first original offence of encroaching on the royal prerogative. And those indigent persons who do so, without having such rank or fortune as is generally called a *qualification*, are guilty, not only of the original offence, but of the aggravations also created by the statutes for preserving the game: which aggravations are so severely punished, and those punishments so implacably inflicted, that the offence against the king is seldom thought of, provided the miserable delinquent can make his peace with the lord of the manor. The only rational footing upon which this offence, thus aggravated, can be considered as a crime, is, that in low and indigent persons it promotes idleness, and takes them away from their proper employments and callings: which is an offence against the public police and œconomy of the commonwealth.

The statutes for preserving the game are many and various, and not a little obscure and intricate; it being remarked, that in one statute only, 5 Ann. c. 14. there is false grammar in no fewer than six places, besides other mistakes: the occasion of which, or what denomination of persons were probably the penners of these statutes, it is unnecessary here to inquire. It may be in general sufficient to observe, that the *qualifications* for killing game, as they are usually called, or more properly the exemptions from the penalties inflicted by the statute-law, are, 1. The having a freehold estate of 100l. *per annum*; there being fifty times the property required to enable a man to kill a partridge, as to vote for a knight of the shire: 2. A leasehold for 99 years of 150l. *per annum*: 3. Being the son and heir apparent of an esquire (a very loose and vague description) or person of superior degree: 4. Being the owner, or keeper, of a forest, park, chase, or warren. For unqualified persons transgressing these laws, by killing game, keeping engines for that purpose, or even having game in their custody, or for persons (however qualified) that kill game, or have it in possession, at unreasonable times of the year, or unreasonable hours of the day or night, on Sundays or on Christmas day, there are various penalties assigned, corporal and pecuniary, by different statutes (after-mentioned), on any of which, but only on one at

a time, the justices may convict in a summary way, or (in most of them) prosecutions may be carried on at the assizes. And, lastly, by statute 28 Geo. II. c. 12. no person, however qualified to kill, may make merchandise of this valuable privilege, by felling or exposing to sale any game, on pain of like forfeiture as if he had no qualification.

The statutes above referred to are as follow. No person shall take pheasants or partridges with engines in another man's ground, without licence, on pain of 10l. stat. 11 Hen. 7. c. 13. If any person shall take or kill any pheasants or partridges, with any net in the night-time, they shall forfeit 20s. for every pheasant, and 10s. for every partridge taken; and hunting with spaniels in standing corn, incurs a forfeiture of 40s. 23 Eliz. c. 10. Those who kill any pheasant, partridge, duck, heron, hare, or other game, are liable to a forfeiture of 20s. for every fowl and hare; and felling, or buying to sell again, any hare, pheasant, &c. the forfeiture is 10s. for each hare, &c. 1 Jac. I. c. 17. Also pheasants or partridges are not to be taken between the first of July and the last of August, on pain of imprisonment for a month, unless the offenders pay 20s. for every pheasant, &c. killed: and constables, having a justice of peace's warrant, may search for game and nets, in the possession of persons not qualified by law to kill game or to keep such nets, 7 Jac. I. c. 11. Constables, by a warrant of a justice of peace, are to search houses of suspected persons for game: and if any game be found upon them, and they do not give a good account how they came by the same, they shall forfeit for every hare, pheasant, or partridge, not under 5s. nor exceeding 20s. And inferior tradesmen hunting, &c. are subject to the penalties of the act, and may likewise be sued for trespass. If officers of the army or soldiers kill game without leave, they forfeit 5l. an officer, and 10s. a soldier; 4 & 5 W. and M. c. 23. Higglers, chapmen, carriers, inn-keepers, victuallers, &c. having in their custody hare, pheasant, partridge, heath-game, &c. (except sent by some person qualified to kill game) shall forfeit for every hare and fowl 5l. to be levied by distress and sale of their goods, being proved by one witness, before a justice; and for want of distress shall be committed to the house of correction for three months: one moiety of the forfeiture to the informer, and the other to the poor. And selling game, or offering the same to sale, incurs the like penalty; wherein hare and other game found in a shop, &c. is adjudged an exposing to sale: killing hares in the night is liable to the same penalties: and if any persons shall drive wild-fowls with nets, between the first day of July and the first of September, they shall forfeit 5s. for every fowl; 5 Ann. c. 14. 9 Ann. c. 25. If any unqualified person shall keep a gun, he shall forfeit 10l.; and persons being qualified may take guns from those that are not, and break them; 22 & 22 Car. II. c. 25. and 33 H. VIII. c. 6. One justice of peace, upon examination and proof of the offence, may commit the offender till he hath paid the forfeiture of 10l. And persons, not qualified by law, keeping dogs, nets, or other engines to kill game, being convicted thereof before a justice of peace, shall forfeit 5l. or be sent to the house of correction for three months; and the dogs, game, &c. shall be taken from them, by the

statute 5 Ann. If a person hunt upon the ground of another, such other person cannot justify killing of his dogs, as appears by 2 Roll. Abr. 567. But it was otherwise adjudged Mich. 33 Car. II. in C. B. 2 Cro. 44. and fee 3. Lev. xxviii. In actions of debt, *qui tam*, &c. by a common informer on the statute 5 Ann. for 15 l. wherein the plaintiff declared on two several counts, one for 10l. for killing two partridges, the other for 5l. for keeping an engine to destroy the game, not being qualified, &c. the plaintiff had a verdict for 5l. only: this action was brought by virtue of the stat. 8 Geo. I. See stat. 9 Geo. I. c. 22. See likewise 24 Geo. II. c. 34. for the better preservation of the game in Scotland. By the stat. 26 Geo. II. c. 2. all suits and actions brought by virtue of stat. 8 Geo. I. c. — for the recovery of any pecuniary penalty, or sum of money, for offences committed against any law for the better preservation of the game, shall be brought before the end of the second term after the offence committed.

By 28 Geo. II. c. 12. persons felling, or exposing to sale, any game, are liable to the penalties inflicted by 5 Ann. c. 14. on higglers, &c. offering game to sale: and game found in the house or possession of a poulterer, salesman, fishmonger, cook, or pastry-cook, is deemed exposing thereof to sale.

By 2 Geo. III. c. 19. after the 1st June 1762, no person may take, kill, buy or sell, or have in his custody, any partridge, between 12th February and 1st September, or pheasant between 1st February and 1st October, or heath-fowl between 1st January and 20th August, or grouse between 1st December and 25th July, in any year; pheasants taken in their proper season, and kept in mews, or breeding places, excepted: and persons offending in any of the cases aforesaid, forfeit 5l. per bird, to the prosecutor, to be recovered, with full costs, in any of the courts at Westminster. By this act, likewise, the whole of the pecuniary penalties under the 8 Geo. I. c. 19. may be sued for, and recovered to the sole use of the prosecutor, with double costs; and no part thereof to go to the poor of the parish.

By 5 George III. c. 14. persons convicted of entering warrens in the night-time, and taking or killing conies there, or aiding or assisting therein, may be punished by transportation, or by whipping, fine, or imprisonment. Persons convicted on this act, not liable to be convicted under any former act. This act does not extend to the destroying conies in the day-time, on the sea and river-banks in the county of Lincoln, &c. No satisfaction to be made for damages occasioned by entry, unless they exceed 1s. It may not be improper to mention an act lately made and not yet repealed, viz. 10 Geo. III. c. 19. for preservation of the game, which shews the importance of the object. It is thereby enacted, That if any person kill any hare, &c. between sun-setting and sun-rising, or use any gun, &c. for destroying game, shall for the first offence be imprisoned for any time not exceeding six nor less than three months: if guilty of a second offence, after conviction of a first, to be imprisoned for any time not exceeding twelve months nor less than six; and shall also, within three days after the time of his commitment either for the first or for any other offence, be once publicly whipped.



*Military Law.* See MILITARY and MARINE.

29. N. Lat. 38. 32.

Lawbur-

rows

Lawsonia.

LAWBURROWS, in Scots law. See LAW, Part III. N<sup>o</sup> clxxxiii. 16.

LAWENBURG, Dutchy, a territory of Germany, in the circle of Lower Saxony, bounded by the duchy of Holstein on the north and west, by the duchy of Mecklenburg on the east, and by the duchy of Lunenburg, from which it is separated by the river Elbe, on the West; being about 85 miles long, and 20 broad. The chief towns are Lawenburg, Mollen, Wittenburg, and Ratzeburg. It belongs to the elector of Hanover.

LAWENBURG, a city of Germany in the circle of Lower Saxony, and capital of a duchy of the same name. It is a small but populous town, situated on the Elbe, under the brow of a very high hill, from whence there is a delightful prospect over the adjacent country. It has a castle on an eminence, and is convenient for trade. E. Long. 10. 51. N. Lat. 53. 36.

LAWENBURG, a town of Germany in Farther Pomerania, and the chief place of a territory of the same name, belonging to the elector of Brandenburg.

LAWES (Henry), a celebrated musician, and the Purcell of his time. He was a servant to Charles I. in his public and private music, and set some of the works of almost every poet of eminence in that reign. The comus of Milton, and several of the lyrics of Waller, were set by him; and both these poets have done him honour in their verses. He composed a considerable number of psalm-tunes in the *Cantica Sacra*, for three voices and an organ; and many more of his compositions are to be seen in a work called *Select airs and dialogues*; also in the *Treasury of music*, and the *Musical companion*. He died in 1662.

LAWES (William), was brother to the former, and a most capital musician. He made above 30 several sorts of music for voices and instruments; nor was there any instrument then in use, but he composed to it as aptly as if he had studied that alone. In the music school at Oxford are two large manuscript volumes of his works in score for various instruments. He was a commissary under general Gerard in the civil war, and, to the great regret of the king, was killed at the siege of Chester in 1645.

LAWLESS COURT, a court said to be held annually on King's Hill at Rochford in Essex, on the Wednesday morning after Michaelmas-day at cock-crowing, where they whisper, and have no candle, nor any pen and ink, but only a coal. Persons who owe suit, or service, and do not appear, forfeit double their rent every hour they are missing.

This servile attendance, Camden informs us, was imposed on the tenants for conspiring at the like unreasonable hour to raise a commotion. The court belongs to the honour of Raleigh, and to the earl of Warwick; and is called *lawless*, from its being held at an unlawful hour.

LAWINGEN, a town of Germany, in the circle of Suabia; formerly imperial, but now subject to the duke of Neuburg. Here the duke of Bavaria, in 1704, fortified his camp to defend his country against the British forces and their allies commanded by the duke of Marlborough, who forced their intrenchments. It is seated on the Danube, in E. Long. 10.

LAWN, a spacious plain in a park, or adjoining to a noble seat. As to the dimensions of a lawn: In a large park, it should be as extensive as the ground will permit; and, if possible, it should never be less than 50 acres: but in gardens of a moderate extent, a lawn of 10 acres is sufficient; and in those of the largest size, 15 acres. The best situation for a lawn, is in the front of the house: and here, if the house front the east, it will be extremely convenient; but the most desirable aspect for a lawn, is that of the south-east. As to the figure of the lawn, some recommend an exact square, others an oblong square, some an oval, and others a circular figure: but neither of these are to be regarded. It ought to be so contrived, as to suit the ground; and as there should be trees planted for shade on the boundaries of the lawn, so the sides may be broken by irregular plantations of trees, which, if there are not some good prospects beyond the lawn, should bound it on every side, and be brought round pretty near to each end of the house. If in these plantations round the lawn, the trees are placed irregularly, some breaking much forwarder on the lawn than others, and not crowded too close together, they will make a better appearance than any regular plantations can possibly do; and if there are variety of trees, properly disposed, they will have a good effect; but only those which make a fine appearance, and grow large, straight, and handsome, should be admitted here. The most proper trees for this purpose, are the elm, oak, chestnut, and beech; and if there are some clumps of ever-green trees intermixed with the others, they will add to the beauty of the whole, especially in the winter-season; the best sorts for this purpose, are lord Weymouth's pine, and the silver and spruce firs.

Laws, in manufactures, a fine sort of linen, remarkable for being used in the sleeves of bishops.

LAWRENCE (St), the largest river in north America, proceeding from the lake Ontario, from which it runs a course of 700 miles to the Atlantic ocean. It is navigable as far as Quebec, which is above 400 miles; but beyond Montreal it is so full of shoals and rocks, that it will not admit large vessels without danger, unless the channel be very well known.

LAWSONIA, EGYPTIAN PRIVET; a genus of the monogynia order, belonging to the octandria class of plants. There are two species, the inermis and spinosa, both natives of India. Some authors take the first to be the plant termed by the Arabians *henna*, or *albenna*; the pulverised leaves of which are much used by the eastern nations for dyeing their nails yellow: but others, Dr Hasselquist in particular, attribute that effect to the leaves of the other species of Egyptian privet which bears prickly branches. It is probable, that neither set of writers are mistaken, and that the shrub in question is a variety only of the thorny lawsonia, rendered mild by culture.

Alhenna grows naturally and is cultivated throughout India, as also in Egypt, Palestine, and Persia. In those countries, says Hasselquist, it flowers from May to August. The leaves being pulverised, are made with water into a paste, which the inhabitants of those countries bind on the nails of their hands and feet, keeping it on all night. The deep yellow colour that

Lawyer  
||  
Lazuli.

is thus obtained is considerably permanent, not requiring to be renewed for several weeks. It would seem, that this custom is very ancient in Egypt; the nails of some mummies being found dyed in this manner. The dried flowers of henna afford a fragrant smell, which, it is affirmed, women with child cannot bear.

**LAWYER**, signifies a counsellor, or one that is learned or skilled in the law. See **COUNSELLOR**, **BARRISTER**, and **SERJEANT**.

**LAY**, in French poetry, denotes a short poem, something like our ballads.

**LAY-BROTHERS**, among the Romanists, those pious but illiterate persons, who devote themselves in some convent to the service of the religious. They wear a different habit from that of the religious; but never enter into the choir, nor are present at the chapters; nor do they make any other vow except of constancy and obedience. In the nunneries there are also *lay-sisters*.

**LAY-MAN**, one who follows a secular employment, and has not entered into holy orders.

**LAYERS**, in gardening, are tender shoots or twigs of trees, laid or buried in the ground, till, having struck root, they are separated from the parent-tree, and become distinct plants.—The propagating trees by *layers* is done in the following manner: The branches of the trees are to be slit a little way, and laid under the mould for about half a foot; the ground should be first made very light, and after they are laid they should be gently watered. If they will not remain easily in the position they are put in, they must be pegged down with wooden hooks: the best season for doing this is, for ever-greens, toward the end of August, and, for other trees, in the beginning of February. If they are found to have taken root, they are to be cut off from the main plant the succeeding winter, and planted out. If the branch is too high from the ground, a tub of earth is to be raised to a proper height for it. Some pare off the rhind, and others twist the branch before they lay it, but this is not necessary. The end of the layer should be about a foot out of the ground; and the branch may be either tied tight round with a wire, or cut upwards from a joint, or cut round for an inch or two at the place, and it is a good method to pierce several holes thro' it with an awl above the part tied with the wire.

**LAYING THE LAND**, in navigation, the state of motion which increases the distance from the coast, so as to make it appear lower and smaller, a circumstance which evidently arises from the intervening convexity of the surface of the sea. It is used in contradistinction to *raising* the land, which is produced by the opposite motion of approach towards it. See **LAND**.

**LAZAR-HOUSE**, or **LAZARETTO**, a public building, in the nature of an hospital, to receive the poor, and those afflicted with contagious distempers. In some places, lazarettos are appointed for the performance of quarantine; in which case, those are obliged to be confined in them who are suspected to have come from places infected with the plague.

**LAZULI**, or *Lapis Lazuli*, is a blue stone, generally intermixed with white veins and gold-coloured spots. Wallerius considers this stone as a species of jasper; and Cronstedt, more justly, as a species of that

order of earths which have been lately called *zeolites*. Mr Margraaf, and also Mr Cronstedt, have made experiments on this stone, carefully cleaned from all white, pyritous, or heterogeneous matters. From these experiments we learn, 1. That this stone is soluble in acids without effervescence; and when it has been previously calcined, it forms gelatinous masses with acids. 2. That by calcination it is not deprived of its blue colour, till at least that operation has been long continued. 3. By a violent fire it is fusible, and forms a frothy glass, sometimes whitish, and sometimes of a dusky yellow-colour, but always clouded with blue spots. 4. Fused with nitre, and thrown red-hot into water, it tinged the water with a blue colour, which disappeared in some hours. By this operation the stone lost its blue colour. 5. Some of this stone, powdered and mixed with glass frit, produced a transparent citron-coloured glass. With borax, it produced a glass of a chrysolite-colour. 6. It gave no signs of its containing copper, notwithstanding it has been considered as an ore of copper by most authors. 7. It showed marks of iron, by forming a blue precipitate, like Prussian blue, when a phlogisticated alkali was added to a solution of this stone in acids. 8. Margraaf says, that by adding vitriolic acid to solutions of this stone in nitrous and marine acids, a white precipitate was formed, which he supposes was calcareous earth. Nevertheless, Mr Cronstedt affirms, that this stone does not effervesce with acids. Perhaps the calcareous earth was not essential, but only accidental. 9. Cronstedt says, that a precipitate is formed by adding a fixed alkali to a solution of this stone in vitriolic acid, which, being scorified with borax, yields a regulus of silver. He says, that by scorification with lead, two ounces of silver have been obtained from a hundred pounds of the stone. Mr Margraaf does not mention that he found any silver, or that he searched for any. Perhaps it is only accidental. The fine blue substance called *ultramarine* is prepared from lapis lazuli in the following manner, according to Wallerius. The stone, first finely levigated and mixed with linseed oil, is to be added to a paste, made by mixing together equal parts of yellow wax, colophony, and pitch, that is, half a pound of each, with half an ounce of linseed oil, two ounces of turpentine, and two ounces of mastic. To three or four parts of this paste one part of the levigated stone, mixed with linseed-oil, is to be added; and after the mixture has been digested together during three or four weeks, it is to be thrown into hot-water, and stirred till the blue colour separates and diffuses in the water, which is then to be poured off. The blue matter is allowed to settle; and, when dry, is the ultramarine required.

The lapis lazuli is found in many parts of the world; but that of Asia and Africa is much superior both in beauty and real value to the Bohemian and German kind, which is too often sold in its place.

**LEAD**. See **CHEMISTRY**, n° 151, 204, 248, 280, 397. and **METALLURGY**.

**Black LEAD**, a mineral dug in Britain, and, as Dr Woodward observes in the preface to his Method of Fossils, more plentiful and of a better kind there than in any other part of the world. According to Dr Plott's account in the Philosophical Transactions, n° 240, it

Lazuli  
Lead

*Lead.* is found only in Kefwyth in Cumberland; and is there called *wadst* or *kellow*, by which last name an earth like the black chalk is distinguished in other places.

The colour of black-lead, rather a deep, shining, bluish-grey, than a black, may be seen, diluted a little, in the black melting-pots when broken or the surface scraped off, and entire in the genuine sort of black pencils. It differs not a little in goodness, some sorts marking paper freely, and others very difficultly or scarce at all. It is smooth, and as it were unctuous to the touch; and hence is used sometimes instead of oil or soap for giving slipperiness to the rubbing parts of machines. Acids neither dissolve it nor alter its colour or unctuousity.

Black-lead has not been found to contain any of the metal from which it receives its name, and its composition appears to be of a very singular kind. From its known resistance to vehement degrees of fire, whether urged by itself in close vessels, or made with clay into melting pots, and placed among the burning fuel, it should seem that it could not partake largely of any volatile substance, and it has been generally supposed to consist chiefly of a talcky earth. But Mr Quist relates, in a curious paper of experiments on black-lead published in the Swedish transactions for 1754, that having exposed many different specimens of this mineral to a strong heat, on a scorifying dish under a muffle, they all yielded sulphureous fumes and flowers in abundance; and that there remained behind, from one sort, only a fifth part of its weight, and from another no more than a 20th part, of a yellow or brown calx, which, being treated with inflammable fluxes, yielded seven tenths of its weight of a metallic mass, which seemed to be a mixture of iron and tin. Agreeably to these experiments, in Cronstedt's Mineralogy black-lead is classed among the sulphureous minerals, and called *sulphur satiated with iron and tin*.

Dr Lewis kept 168 grains of the finest black lead used by our pencil-makers in a moderately strong red heat on a scorifying dish for three hours, with the common precaution of covering the vessel for a time, lest the matter should crackle, and some particles be thrown off from it in substance. He found it reduced to about 120 grains, and all the pieces changed on the outside to a rusty sparkling brown calx; of which a considerable part was attracted by a magnetic bar, the internal parts continuing of the same colour as at first. Being then broken into smaller pieces, and exposed to a like heat for two hours, it suffered the same change as before, and was reduced to about 60 grains. Being further broken, and calcined with a moderate red heat for 10 hours, it was diminished to 30 grains; and, by a repetition of the operation, to 12 grains, or  $\frac{1}{14}$  of its original weight.

The remarkable diffipation in these experiments, of a substance which in close vessels resists intense fires, may be somewhat illustrated by the known property of charcoal, which when excluded from the action of the air, whether by being inclosed in a vessel, or mixed with clay into a mass, remains unconsumed and unaltered in the fire. Masses of black-lead seem to calcine and suffer a diffipation only on the surface; the internal part remaining long unchanged, unless

the mass be broken, or the calx rubbed off, so that fresh surfaces may be exposed to the air. The common black-lead melting-pots made of clay, and the coarser kinds of black-lead powdered, like those made of clay and charcoal powder, lose their external blackness with part of their weight, and thus have their staining quality destroyed by strong fire.

*Black-LEAD Pencils.* Black-lead, in fine powder, stirred into melted sulphur, unites with it so uniformly and in such quantity, that though the compound remains fluid enough to be poured into moulds, it looks nearly like the coarser sorts of black-lead themselves. Probably the way which prince Rupert is said to have had, mentioned in the third volume of Dr Birch's history of the Royal Society, of making black-lead run like a metal in a mould, so as to serve for black-lead again, consisted in mixing it with sulphur or sulphureous bodies.

On this principle the German black-lead pencils are said to be made; and many of those which are hawked about by certain persons among us, are prepared in the same manner: their melting or softening, when held in a candle, or applied to a red-hot iron, and yielding a bluish flame with a strong smell of burning brimstone, betrays their composition; for black-lead itself yields no smell or fume, and suffers no apparent alteration in that heat. Pencils made with such additions are of a very bad kind: they are hard, brittle, and do not cast or make a mark freely either on paper or wood, rather cutting or scratching them, than leaving a coloured stroke.

The true English pencils, (which Vogel in his Mineral System, and some other foreign writers, imagine to be prepared also by melting the black-lead with some additional substances, and casting it into a mould) are formed of black-lead alone, sawed into slips, which are fitted into a groove made in a piece of wood, and another slip of wood glued over them: the softest wood, as cedar, is made choice of, that the pencil may be the easier cut; and a part at one end, too short to be conveniently used after the rest has been worn and cut away, is left unfilled with the black-lead, that there may be no waste of so valuable a commodity. These pencils are greatly preferable to the others, though seldom so perfect as could be wished, being accompanied with some degree of the same inconveniences, and being very unequal in their quality, on account of different sorts of the mineral being fraudulently joined together in one pencil, the forepart being commonly pretty good, and the rest of an inferior kind. Some, to avoid these imperfections, take the finer pieces of black-lead itself, which they saw into slips, and fix for use in port-crayons. This is doubtless the surest way of obtaining black-lead crayons whose goodness can be depended upon.

*Milled LEAD.* See CHEMISTRY, n° 490.

*Poison of LEAD.* See POISON.

*LEAF*, a part of a plant extended into length and breadth in such a manner as to have one side distinguishable from the other. This is Miller's definition. Linnæus denominates leaves "the organs of motion, or muscles of the plant."—The leaves are not merely ornamental to plants; they serve very useful purposes, and make part of the organs of vegetation.

*Lead.  
Leaf.*

The



The greater number of plants, particularly trees, are furnished with leaves: in mushrooms, and shrubby horse-tail, they are totally wanting. Ludwig defines leaves to be fibrous and cellular processes of the plant, which are of various figures, but generally extended into a plain membranaceous or skinny substance. They are of a deeper green than the foot-stalks on which they stand, and are formed by the expansion of the vessels of the stalk, among which, in several leaves, the proper vessels are distinguished by the particular taste, colour, and smell, of the liquors contained within them.

By the expansion of the vessels of the stalk, are produced several ramifications or branches, which, crossing each other mutually, form a kind of net; the meshes or interstices of which are filled up with a tender cellular substance, called the *pulp*, *pith*, or *parenchyma*. This pulpy substance is frequently consumed by certain small insects, whilst the membranous net remaining untouched, exhibits the genuine skeleton of the leaf.

The net in question is covered externally with an epidermis or scarf-skin, which appears to be a continuation of the scarf-skin of the stalk, and perhaps of that of the stem. M. Deaussure, a judicious naturalist, has attempted to prove, that this scarf-skin, like that of the petals, is a true bark, composed itself of an epidermis and cortical net; these parts seem to be the organs of perspiration, which serve to dissipate the superfluous juices.

The cortical net is furnished, principally on the surface of the leaf, with a great number of suckers or absorbent vessels, destined to imbibe the humidity of the air. The upper surface, turned towards heaven, serves as a defence to the lower, which looks downward; and this disposition is so essential to the vegetable economy, that, if a branch is overturned in such a manner as to destroy the natural direction of the leaves, they will, of themselves, in a very short time, resume their former position; and that as often as the branch is thus overturned.

Leaves, then, are useful and necessary organs; trees perish when totally divested of them. In general, plants strip of any of their leaves, cannot shoot vigorously: witness those which have undergone the depredations of insects; witness, likewise, the very common practice of stripping off some of the leaves from plants, when we would suspend their growth, or diminish the number of their shoots. This method is sometimes observed with corn and the esculent grasses; and, in cold years, is practised on fruit-trees and vines, to render the fruit riper and better coloured: but in this case it is proper to wait till the fruits have acquired their full bulk, as the leaves contribute greatly to their growth, but hinder, when too numerous, that exquisite rectifying of the juices, which is so necessary to render them delicious and palatable.

When vegetation ceases, the organs of perspiration and inspiration become superfluous. Plants, therefore, are not always adorned with leaves: they produce new ones every year; and every year the greater part are totally divested of them, and remain naked during the winter. See PLANT.

LEAF, in clocks and watches, an appellation given to the notches of their pinions.

Gold-LEAF, usually signifies fine gold beaten into Gold-Leaf plates of an exceeding thinness, which are well known in the arts of gilding, &c. The preparation of gold-leaf, according to Dr Lewis, is as follows.

"The gold is melted in a black-lead crucible, with some borax, in a wind-furnace, called by the workmen a *wind-hole*: as soon as it appears in perfect fusion, it is poured out into an iron ingot mould, six or eight inches long, and three quarters of an inch wide, previously greased, and heated, so as to make the tallow run and smoke, but not to take flame. The bar of gold is made red-hot, to burn off the unctuous matter, and forged on an anvil into a long plate, which is further extended, by being passed repeatedly between polished steel rollers, till it becomes a ribbon as thin as paper. Formerly the whole of this extension was procured by means of the hammer, and some of the French workmen are still said to follow the same practice: but the use of the flattening-mill both abridges the operation, and renders the plate of more uniform thickness. The ribbon is divided by compasses, and cut with sheers into equal pieces, which consequently are of equal weights: these are forged on an anvil till they are an inch square; and afterwards well nealed, to correct the rigidity which the metal has contracted in the hammering and flattening. Two ounces of gold, or 960 grains, the quantity which the workmen usually melt at a time, make 50 of these squares, whence each of them weighs six grains and two-fifths; and as 902 grains of gold make a cubic inch, the thickness of the square plates is about the 766th part of an inch.

"In order to the further extension of these pieces into fine leaves, it is necessary to interpose some smooth body between them and the hammer, for softening its blow, and defending them from the rudeness of its immediate action: as also to place between every two of the pieces some proper intermedium, which, while it prevents their uniting together, or injuring one another, may suffer them freely to extend. Both these ends are answered by certain animal membranes.

"The gold-beaters use three kinds of membranes; for the outside cover, common parchment made of sheep-skin; for interlaying with the gold, first the smoothest and closest vellum, made of calf-skin; and afterwards the much finer skins of ox-gut, strip off from the large straight gut slit open, curiously prepared on purpose for this use, and hence called *gold-beaters skin*. The preparation of these last is a distinct business, practised by only two or three persons in the kingdom, some of the particulars of which I have not satisfactorily learned. The general process is said to consist, in applying one upon another, by the smooth sides, in a moist state, in which they readily cohere and unite inseparably; stretching them on a frame, and carefully scraping off the fat and rough matter, so as to leave only the fine exterior membrane of the gut; beating them between double leaves of paper, to force out what unctuousity may remain in them; moistening them once or twice with an infusion of warm spices; and lastly, drying and pressing them. It is said, that some calcined gypsum, or plaster-of-Paris, is rubbed with a hare's foot both on the vellum and the ox-gut skins, which fills up such minute holes as may happen

in them, and prevents the gold-leaf from flaking, as it would do to the simple animal-membrane. It is observable, that, notwithstanding the vast extent to which the gold is beaten between these skins, and the great tenuity of the skins themselves, yet they sustain continual repetitions of the process for several months, without extending or growing thinner. Our workmen find, that, after 70 or 80 repetitions, the skins, though they contract no flaw, will no longer permit the gold to extend between them; but that they may be again rendered fit for use by impregnating them with the virtue which they have lost, and that even holes in them may be repaired by the dextrous application of fresh pieces of skin: a microscopical examination of some skins that had been long used plainly shewed these repairs. The method of restoring their virtue is said in the *Encyclopédie* to be, by interlaying them with leaves of paper moistened with vinegar white-wine, beating them for a whole day, and afterwards rubbing them over as at first with plaster-of-Paris. The gold is said to extend between them more easily, after they have been used a little, than when they are new.

"The beating of the gold is performed on a smooth block of black marble, weighing from 200 to 600 pounds, the heavier the better; about nine inches square on the upper surface, and sometimes less, fitted into the middle of a wooden frame, about two feet square, so as that the surface of the marble and the frame form one continuous plane. Three of the sides are furnished with a high ledge; and the front, which is open, has a leather flap fastened to it, which the gold-beater takes before him as an apron, for preserving the fragments of gold that fall off. Three hammers are employed, all of them with two round and somewhat convex faces, though commonly the workman uses only one of the faces: the first, called the *cutch-hammer*, is about four inches in diameter, and weighs 15 or 16 pounds, and sometimes 20, though few workmen can manage those of this last size: the second, called the *shoddering-hammer*, weighs about 12 pounds, and is about the same diameter: the third, called the *goldhammer*, or *finishing hammer*, weighs 10 or 11 pounds, and is nearly of the same width. The French use four hammers, differing both in size and shape from those of our workmen: they have only one face, being in figure truncated cones. The first has very little convexity, is near five inches in diameter, and weighs 14 or 15 pounds: the second is more convex than the first, about an inch narrower, and scarcely half its weight: the third, still more convex, is only about two inches wide, and four or five pounds in weight: the fourth or finishing hammer is near as heavy as the first, but narrower by an inch, and the most convex of all. As these hammers differ so remarkably from ours, I thought proper to insert them, leaving the workmen to judge what advantage one set may have above the other.

"A hundred and fifty of the pieces of gold are interlaid with leaves of vellum, three or four inches square, one vellum leaf being placed between every two of the pieces, and about 20 more of the vellum leaves on the outides; over these is drawn a parchment case, open at both ends, and over this another in a contrary direction, so that the assemblage of gold

and vellum leaves is kept tight and close on all sides. Gold-Leaf. The whole is beaten with the heaviest hammer, and every now and then turned upside down, till the gold is stretched to the extent of the vellum; the case being from time to time opened for discovering how the extension goes on, and the packet, at times, bent and rolled as it were between the hands, for procuring sufficient freedom to the gold, or, as the workmen say, to make the gold work. The pieces, taken out from between the vellum leaves, are cut in four with a steel knife; and the 600 divisions, hence resulting, are interlaid, in the same manner, with pieces of the ox-gut skins five inches square. The beating being repeated with a lighter hammer till the golden plates have again acquired the extent of the skins, they are a second time divided in four: the instrument used for this division is a piece of cane cut to an edge, the leaves being now so light, that the moisture of the air or breath condensing on a metalline knife would occasion them to stick to it. These last divisions being so numerous, that the skins necessary for interposing between them would make the packet too thick to be beaten at once, they are parted into three parcels, which are beaten separately, with the smallest hammer, till they are stretched for the third time to the size of the skins: they are now found to be reduced to the greatest thinness they will admit of; and indeed many of them, before this period, break or fail. The French workmen, according to the minute detail of this process given in the *Encyclopédie*, repeat the division and the beating once more; but as the squares of gold, taken for the first operation, have four times the area of those used among us, the number of leaves from an equal area is the same in both methods, viz. 16 from a square inch. In the beating, however simple the process appears to be, a good deal of address is requisite, for applying the hammers so as to extend the metal uniformly from the middle to the sides: one improper blow is apt not only to break the gold leaves, but to cut the skins.

"After the last beating, the leaves are taken up by the end of a cane instrument, and, being blown flat on a leather-cushion, are cut to a size, one by one, with a square frame of cane made of a proper sharpness, or with a frame of wood edged with cane: they are then fitted into books of 25 leaves each, the paper of which is well smoothed, and rubbed with red-bole to prevent their sticking to it. The French, for sizing the leaves, use only the cane-knife; cutting them first straight on one side, fitting them into the book by the straight side, and then paring off the superfluous parts of the gold about the edges of the book. The size of the French gold leaves is from somewhat less than three inches to three and three quarters square; that of ours, from three inches to three and three-eighths.

"The process of gold-beating is considerably influenced by the weather. In wet weather, the skins grow somewhat damp, and in this state make the extension of the gold more tedious: the French are said to dry and press them at every time of using; with care not to over-dry them, which would render them unfit for further service. Our workmen complain more of frost, which appears to affect the metalline leaves themselves: in frost, a gold-leaf cannot easily

Gold-Leaf. easily be blown flat, but breaks, wrinkles, or runs together.

"Gold-leaf ought to be prepared from the finest gold; as the admixture of other metals, though in too small a proportion to sensibly affect the colour of the leaf, would dispose it to lose of its beauty in the air. And indeed there is little temptation to the workman to use any other; the greater hardness of alloyed gold occasioning as much to be lost in point of time and labour, and in the greater number of leaves that break, as can be gained by any quantity of alloy that would not be at once discoverable by the eye. All metals render gold harder and more difficult of extension: even silver, which in this respect seems to alter its quality less than any other metal, produces with gold a mixture sensibly harder than either of them separately, and this hardness is in no art more felt than in the gold-beater's. The French are said to prepare what is called the *green gold-leaf*, from a composition of one part of copper and two of silver with eighty of gold. But this is probably a mistake: for such an admixture gives no greenness to gold; and I have been informed by our workmen, that this kind of leaf is made from the same fine gold as the highest gold-coloured sort, the greenish hue being only a superficial tint induced upon the gold in some part of the process: this greenish leaf is little otherwise used than for the gilding of certain books.

"But though the gold-beater cannot advantageously diminish the quantity of gold in the leaf by the admixture of any other substance with the gold, yet means have been contrived, for some particular purposes, of saving the precious metal, by producing a kind of leaf called *party-gold*, whose basis is silver, and which has only a superficial coat of gold upon one side; a thick leaf of silver and a thinner one of gold, laid flat on one another, heated, and pressed together, unite and cohere; and being then beaten into fine leaves, as in the foregoing process, the gold, though its quantity is only about one fourth of that of the silver, continues every where to cover it, the extension of the former keeping pace with that of the latter.

LEAGUE, a measure of length, containing more or fewer geometrical paces, according to the different usages and customs of countries. A league at sea, where it is chiefly used by us, being a land-measure mostly peculiar to the French and Germans, contains 3000 geometrical paces, or three English miles. The French league sometimes contains the same measure, and in some parts of France it consists of 3500 paces: the mean or common league consists of 2400 paces, and the little league of 2000. The Spanish leagues are larger than the French, 17 Spanish leagues making a degree, or 20 French leagues, or 69½ English statute-miles. The Dutch and German leagues contain each four geographical miles. The Persian leagues are pretty near of the same extent with the Spanish; that is, they are equal to four Italian miles: which is pretty near to what Herodotus calls the length of the Persian parasang, which contained 30 stadia, eight whereof, according to Strabo, make a mile. The word comes from *leuca*, or *leuga*, an ancient Gaulish word for an itinerary measure, and retained in that sense by the Romans. Some derive the word *leuca* from λευκος, "white;" as the Gauls, in imi-

tation of the Romans, marked the spaces and distances of their roads with white stones.

LEAGUE also denotes an alliance or confederacy between princes and states for their mutual aid, either in attacking some common enemy, or in defending themselves. The word comes from *liga*, which in the corrupt Latin was used for a confederacy: *Qua quis cum alio ligatur*.

LEAGUES of the *Grisons*, are a part of Switzerland, consisting of three subdivisions, viz. the upper league, the league of the house of Gad, and the league of the ten jurisdictions. See the article SWITZERLAND.

The LEAGUE, by way of eminence, denotes that famous one on foot in France, from the year 1576 to 1593. Its intent was to prevent the succession of Henry IV. who was of the reformed religion, to the crown; and it ended with his abjuration of that faith.

The *leaguers*, or confederates, were of three kinds. The *zealous leaguers* aimed at the utter destruction, not only of the Huguenots, but also of the ministry. The *Spanish leaguers* had principally in view the transferring the crown of France to the king of Spain, or the infant's daughter. The *moderate leaguers* aimed only at the extirpation of Calvinism, without any alteration of the government.

LEAK, at sea, is a hole in the ship, thro' which the water comes in. A ship is said to *spring a leak*, when she begins to *leak* or to let in the water. The manner of stopping a leak is to put into it a plug wrapped in oakum and well tarred, or in a tarpawling clout, which keeps out the water, or nailing a piece of sheet lead on the place.—Seamen sometimes stop a leak by thrusting a piece of salt beef into it. The seawater, says Mr Boyle, being fresher than the brine imbibed by the beef, penetrates into its body, and causes it to swell so as to bear strongly against the edges of the broken plank, and thereby stops the influx of the water.—A ready way to find a leak in a ship is to apply the narrower end of a speaking trumpet to the ear, and the other to the side of the ship where the leak is supposed to be; then the noise of the water issuing in at the leak will be heard distinctly, whereby it may be discovered.

LEAKAGE, the state of a vessel that leaks, or lets water or other liquid ooze in or out.

LEAKAGE, in commerce, is an allowance of 12 per cent. in the customs, allowed to importers of wines for the waste or damage it is supposed to have received in the passage: an allowance of two barrels in 22 is also made to the brewers of ale and beer, by the excise-office.

LEAKE (Richard), master-gunner of England, was born at Harwich in 1629, and was bred to the sea. At the restoration, he was made master-gunner of the Prince's, a frigate of 50 guns; and in the first Dutch war distinguished himself by his skill and bravery in two extraordinary actions; one against 15 sail of Dutch men of war; and another in 1667 against two Danes in the Baltic, in which the commanding officers of the Prince's being killed or desperately wounded, the command, according to the rules of war at that time, fell to the gunner. In 1669, he was promoted to be gunner of the Royal Prince, a first-rate man

of



Leake. of war. He was engaged, with his two sons Henry and John, in the battle against Van Tromp, in 1673; when the Royal Prince had all her masts shot away, near 400 of her men killed and disabled, and most of her upper tier of guns dismounted. As she lay thus like a wreck, a great Dutch man of war came down upon her with two fire-ships, either to burn or carry her off; and Captain Rooke, afterwards Sir George, thinking it impossible to defend her, ordered the men to save their lives, and the colours to be struck. Mr Leake hearing this, ordered the lieutenant off the quarter-deck, and took the command upon himself, saying, "The Royal Prince shall never be given up to the enemy while I am alive to defend her." The undaunted spirit of the brave gunner inspired the small residue of the ship's company with resolution: they returned with alacrity to the fight, and, under the direction of this valiant gunner and his two sons, sunk both the fire-ships, and obliged the man of war to sheer off; and having thus saved the Royal Prince, he brought her into Chatham. But Mr Leake's joy in obtaining this victory was damped by the loss of Henry, his eldest son, who was killed near him. Soon after, Mr Leake was preferred to the command of a yacht, and also made gunner of Whitehall. In 1677, he obtained a grant for life of the office of master-gunner of England, and store-keeper of the ordnance at Woolwich. By these posts he had full scope for his genius. He accordingly, among other things, invented the culsee-piece; and contrived to fire a mortar by the blast of a piece, which has been used ever since. He was also the principal contriver of what the French call *infernals*, used at the bombardment at St Malo's in 1693. Mr Leake had a surprising genius for all inventions of this kind; and had frequent trials of skill with French and Dutch gunners and engineers in Woolwich warren, at which king Charles II. and the duke of York were often present, and he never failed to excel all his competitors: nor was he less skilled in the art of making compositions for fireworks; of which he likewise made frequent trials, with equal success.

LEAKE (Sir John), an English admiral, distinguished by his bravery and success, was born in 1656, and was taught mathematics and gunnery by Mr Richard Leake, his father, who was master-gunner of England. Entering early into the navy, he distinguished himself under his father in 1673, in the memorable engagement between Sir Edward Spragg and Van Tromp, when but 16 years of age; and being afterwards made captain, he signalled himself, among other occasions, by executing the desperate attempt of conveying some victuals into Londonderry, which obliged the enemy to raise the siege; and at the famous battle of La Hogue. In 1702, being made commodore of a squadron, he destroyed the French trade and settlements at Newfoundland, and restored the English to the possession of the whole island. On his return he was created rear-admiral; soon after, he was made vice-admiral of the blue, and was afterwards knighted. He was engaged with admiral Rook in taking Gibraltar: soon after which, he particularly distinguished himself in the general engagement off Malaga; when, commanding the leading squadron of the van, consisting only of six ships, he drove that of the

enemy consisting of 13, out of the line of battle, so disabled that they never returned to the fight. In 1705, he relieved Gibraltar, which the French had besieged by sea, and the Spaniards by land, so seasonably, that the enemy was to have attacked the town that very night in several places, and would undoubtedly have made themselves masters of it. Five hundred Spaniards had, by the help of rope-ladders, climbed up the rocks by a way that was thought inaccessible. At the same time they had got a great number of boats to land 3000 men at the New Mole, who, by making a vigorous assault on the side next the sea, were to draw the garrison to oppose that attack, while the 500 concealed men rushed into the town. These being the next day drawn by hunger out of their ambuscade, were discovered; on which Sir John assisting the garrison with sailors and marines, they were attacked with such vigour, that, though they had taken an oath not to surrender to the English, 190 common soldiers and 30 officers took quarter; 200 were killed on the spot; and the rest, who endeavoured to make their escape, fell headlong down the rock. He was soon after made vice-admiral of the white, and then twice relieved that fortress. The last time, he attacked five ships of the French fleet coming out of the bay, of whom two were taken, and two run ashore and were destroyed; baron Pointi died soon after, of the wounds he received in the battle; and in a few days the enemy raised the siege.

In the year 1705, Sir John was engaged in the reduction of Barcelona; and the next year relieved that city, when it was reduced to the last extremity, and obliged king Philip to raise the siege. Soon after he took the city of Carthagea; from whence proceeding to Alicant and Joyce, both these submitted to him; and he concluded the exploits of that year with the reduction of the city and island of Majorca. Upon his return home, prince George of Denmark made him a present of a ring valued at 400 l. and he had the honour of receiving 1000 l. from the queen as a reward for his services. Upon the unhappy death of Sir Cloudesly Shovel, in 1707, he was made admiral of the white, and commander in chief of her majesty's fleet; and the next year, surprising a convoy of the enemy's corn, he sent it to Barcelona, and thus saved both that city and the confederate army from the danger of famine: soon after, conveying the new queen of Spain to king Charles her consort, her majesty made him a present of a diamond ring of 500 pounds value. He then proceeded to the island of Sardinia, which he reduced to the obedience of king Charles; and soon after assisted the lord Stanhope in the conquest of Minorca.

Then returning home, he was appointed one of the council to the lord high admiral; and in 1709, was made rear-admiral of Great Britain. He was several times chosen member of Parliament for Rochester; and in 1712, conducted the English forces to take possession of Dunkirk. But upon the accession of king George I. he was superseded, and allowed a pension of 600 l. a-year. After this, he lived privately till his death, which happened at his house in Greenwich in 1720.

LEANDER, in poetic history, a young man of Abydos in Asia. He used to swim over the Helles-

Leake,  
Leander.

Leao  
in  
Leao.

spont by night to visit Hero his mistress, who let forth a light to guide him: but in a tempestuous winter-night, he was drowned; upon which Hero seeing him dead on the shore, cast herself headlong from the tower, and died also.

LEAO, in natural history, a mineral substance approaching to the nature of the lapis lazuli, found in the East Indies, and of great use in the Chinese porcelain manufactures, being the finest blue they are possessed of. This stone is found in the strata of pit-coal, or in those of a yellowish or reddish earth in the neighbourhood of the veins of coal. There are often found pieces of it lying on the surface of the ground, and these are a sure indication that more will be found on dipping. It is generally found in oblong pieces of the size of a finger, not round, but flat. Some of this is very fine, and some coarse and of a bad colour. The latter is very common; but the fine sort is scarce, and greatly valued. It is not easy to distinguish them at sight, but they are found by experiment; and the trying one piece is generally sufficient for judging of the whole mine, for all that is found in the same place is usually of the same sort.

The manner of preparing it for use is this: They first wash it very clean, to separate it from the earth or any other foulness it may have: they then lay it at the bottom of their baking furnaces; and when it has been thus calcined for three or four hours, it is taken out, and powdered very fine in large mortars of porcelain with stone pestles faced with iron. When the powder is perfectly fine, they pour in boiling water, and grind that with the rest, and when it is thoroughly incorporated, they add more, and finally pour it off after some time settling. The remainder at the bottom of the mortar, which is the coarser part, they grind again with more water; and so on, till they have made the whole fine, excepting a little dirt or grit. When this is done, all the liquors are mixed together, and well stirred. They are suffered to stand two or three minutes after this, and then poured off with the powder remaining in them: this is suffered to subside gradually, and is the fine blue used in their best works, our common small serving for the blue of all the common china ware.

LEAP, in music, is when the song does not proceed by conjoint degrees, as when between each note there is an interval of a third, a fourth, fifth, &c.

Leap Year. See YEAR, and ASTRONOMY, n° 292.

LEAPING, or VAULTING. See VAULTING.

LEAR, the name of a British king said in old chronicles to have succeeded his father Bladud, about A. M. 3160. The story of this king and his three daughters, is well known from Shakspeare's excellent tragedy founded on it.

LEASE and RELEASE, a species of conveyance used in the English law, first invented by serjeant Moore, soon after the statute of uses, and now the most common of any, and therefore not to be shaken; though very great lawyers, (as particularly Mr Noy), have formerly doubted its validity. It is thus contrived. A lease, or rather bargain and sale, upon some pecuniary consideration, for one year, is made by the tenant of the freehold to the lessee or bargainee. Now this, without any enrollment, makes the bargainor stand seized to the use of the bargainee, and vests in the bar-

gainee the use of the term for a year; and then the statute immediately annexes the possession. He therefore, being thus in possession, is capable of receiving a release of the freehold and reversion, which must be made to a tenant in possession; and accordingly, the next day, a release is granted to him. This is held to supply the place of livery of seisin; and so a conveyance by lease and release is said to amount to a conveyance.

LEASH, among sportsmen, denotes three creatures of any kind; but chiefly gre-hounds, foxes, bucks, and hares.

The term *leash* also signifies a line to hold in a hunting dog; and a small long thong of leather, by which a falconer holds his hawk.

LEASING-MAKING, in Scots law, the uttering of words tending to excite discord between the king and his people; also called *verbal sedition*.

LEATHER, the skin of several sorts of beasts dressed and prepared for the use of various manufacturers, whose business it is to make them up.

DYEING of Leather, Skins, &c. Blue is given by steeping the subject a day in urine and indigo, then boiling it with alum: or it may be given by tempering the indigo with red-wine, and washing the skins therewith. Red is given by washing the skins, and laying them two hours in galls, then wringing them out, dipping them in a liquor made with ligu-strum, alum, and verdigraese in water; and lastly, in a dye made of brazil wood, boiled with ley. Purple is given by wetting the skins with a solution of roche alum in warm water; and, when dry again, rubbing them with the hand with a decoction of log-wood in colder. Green is given by smearing the skin with sap-green and alum-water boiled. Dark-green is also given with steel-slings and sal armoniac steeped in urine till soft, then smeared over the skin; which is to be dried in the shade. Sky-colour is given with indigo steeped in boiling water, and the next morning warmed and smeared over the skin. Yellow, by smearing the skin over with aloes and linseed-oil dissolved and strained; or by infusing it in weld. Orange-colour is given by smearing with sultic berries boiled in alum-water; or, for a deep orange, with turmeric.

Processes for Dyeing LEATHER Red and Yellow as practised in Turkey, with directions for Preparing and Tanning the Skins; as communicated by Mr Philippo, a native of Armenia, who received from the Society for the Encouragement of Arts, &c. one hundred pounds, and also the gold medal of the Society, as a reward for discovering this secret.

1. First Preparation of the Skins, both for Red and Yellow Leather, by dressing them in Lime. Let the skins, dried with the hair on, be first laid to soak in clean water for three days; let them then be broken over the flesh-side, put into fresh water for two days longer, and afterwards hung up to drain half an hour. Let them now be broken on the flesh-side, limed in cold lime on the same side, and doubled together with the grain-side outward. In this state they must be hung up within-doors over a frame for five or six days, till the hair be loose; which must then be taken off, and the skins returned into the lime-pit, for about three weeks. Take them out, and let them be well worked flesh and grain, every sixth or seventh day during that time:

Leash  
Leather

Leather. time: after which, let them be washed ten times in clear water, changing the water at each washing. They are next to be prepared in drench, as below mentioned.

2. *Second Preparation of the Skins for both the Red and Yellow Dyes by drenching.* After squeezing the water out of the skins, put them into a mixture of bran and water, warm as new milk, in the following proportions; viz. about three pounds of bran for five skins, and water sufficient to make the mixture moderately fluid, which will be about a gallon to each pound of bran. In this drench let the skins lie three days; at the end of which time they must be well worked, and afterwards returned into the drench two days longer. They must then be taken out and rubbed between the hands; the water squeezed from them, and the bran scraped off clear from both sides of the skins. After this they must be again washed ten times in clear water, and the water squeezed out of them.

Thus far the preparatory process of all the skins, whether intended to be dyed red or yellow, is the same; but afterwards those which are to be dyed red, must be treated as follows.

3. *Preparation in Honey and Bran of the Skins that are to be dyed Red.* Mix one pound of honey with three pints of luke-warm water, and stir them together till the honey is dissolved. Then add two double handfuls of bran; and taking four skins (for which the above quantity of the mixture will be sufficient) work them well in it one after another. Afterwards fold up each skin separately into a round form, with the flesh-side inwards; and lay them in an earthen pan, or other proper vessel; if in the summer, by the side of each other; but in the winter, on the top of each other. Place the vessel in a sloping position, so that such part of the fluid as may spontaneously drain from the skins, may pass from them. An acid fermentation will then rise in the liquor, and the skins will swell considerably. In this state they must continue for seven or eight days; but the moisture that drains from them must be poured off, once or twice a-day, as occasion may require. After this a further preparation in salt is necessary; and which must be performed in the following manner.

4. *Preparation in Salt, of the Skins to be dyed Red.* After the skins have been fermented in the honey and bran, as abovementioned, let them be taken out of that mixture on the eighth or ninth day, and well rubbed with dry common sea-salt, in the proportion of about half a pound to each skin; the salt must be well rubbed and worked with them. This will make them contract again, and part with a further considerable quantity of moisture; which must be squeezed out by drawing each skin separately through the hands. They must next be scraped clean on both sides from the bran, superfluous salt, and moisture that may adhere to them. After which, dry salt must be strewn over the grain-side, and well rubbed in with the hands. They are

then to be doubled with the flesh-side outwards, lengthwise from neck to tail, and a little more dry salt must be thinly strewn over the flesh-side, and rubbed in; for the two last operations, about a pound and a half of salt will be sufficient for each skin. They must then be put, thus folded on each other, between two clean boards, placed sloping, breadthwise; and a heavy weight laid on the upper board, in order gradually to press out what moisture they will thus part with. In this state of pressure, they must be continued two days or longer, till it is convenient to dye them, for which they will then be duly prepared.

5. *Preparation of the Red Dye, in a proper proportion for four skins.* Put eight gallons of water into a copper, with seven ounces of shenan (A) tied up in a linen bag. Light a fire under a copper; and when the water has boiled about a quarter of an hour, take out the bag of shenan, and put into the boiling fluid or lixivium, 1 lb, two drams of alum; 2 dly, two drams pomegranate bark; 3 dly, three quarters of an ounce of turmeric; 4 thly, three ounces of cochineal; 5 thly, two ounces of loaf-sugar. Let the whole mixture boil about six minutes, then cover the fire, and take out a quart of liquor, putting it into a flat earthen pan; and when it is as cold as new milk, take one skin, folded lengthwise, the grain-side outwards, and dip it in the liquor, rubbing it gently with the hands. Then taking out the skin, hang it up to drain, and throw away the superfluous dye. Proceed in the same manner with the remaining three skins; repeating the operation of each skin separately, eight times, squeezing the skins by drawing them through the hands before each fresh dipping. Lay them now on one side of a large pan, let sloping, to drain off as much of the moisture as will run from them without pressure, for about two hours, or till they are cold; then tan them as below directed.

6. *Tanning the Red Skins.* Powder four ounces of the best white galls in a marble mortar, sifting it thro' a fine sieve. Mix the powder with about three quarts of water, and work the skins well in this mixture for half an hour or more, folding up the skins four-fold. Let them lie in this tan for 24 hours; when they must be worked again as before; then taken out, scraped clean on both sides from the first galls, and put into a like quantity of fresh galls and water. In this fresh mixture they must be again well worked for three quarters of an hour; then folded up as before, and left in the fresh tan for three days. On the fourth day they must be taken out, washed clean from the galls in seven or eight fresh quantities of water, and then hung up to dry.

7. *Manner of Dressing the Skins after they are tanned.* When the skins have been treated as above, and are very near dry, they should be scraped with the proper instrument or scraper on the flesh-side, to reduce them to a proper degree of thickness. They are then to be laid on a smooth board, and glazed by rubbing them

(A) Shenan is a drug much used by dyers in the East; and may easily be procured at any of the ports of Syria and Africa, in the Levant. It is the Eastern jointed-kali, called by botanists *salicornia*; and grows in great plenty in those and other parts of the East. There is a lesser species of the *salicornia* on our coast, which, from its great affinity with the shenan, might be presumed to have the same qualities. On some trials, however, it has not appeared to answer the intention of the shenan; but it will be prudent to pursue the examination of this further, as some unknown circumstances in the collecting or using the English *salicornia* might occasion the miscarriage. But be this as it may, the Eastern shenan may, at all events, be easily procured in any quantity, at a very trifling expence, by any of the captains of Turkey ships, at Aleppo, Smyrna, &c.



Leather.

with a smooth glass. After which they must be oiled, by rubbing them with olive-oil, by means of a linen rag, in the proportion of one ounce and a half of oil for four skins: they are then to be grained on a graining board, lengthwise, breadthwise, and cornerwise, or from corner to corner.

8. *Preparation with Galls, for the Skins to be dyed Yellow.* After the four skins are taken out of the drench of bran, and clean washed as before directed in the second article, they must be very well worked, half an hour or more, in a mixture of a pound and a half of the best white galls, finely powdered, with two quarts of clean water. The skins are then to be separately doubled lengthwise; rolled up with the flesh-side outwards, laid in the mixture, and close pressed down on each other, in which state they must continue two whole days. On the third day let them be again worked in the tan; and afterwards scraped clean from the galls, with an ivory or brags instrument (for no iron must touch them.) They must then be put into a fresh tan, made of two pounds of galls finely powdered, with about three quarts of water, and well worked therein 15 times. After this they must be doubled, rolled up as before, and laid in the second tan for three days. On the third day a quarter of a pound of white sea-salt must be worked into each skin; and the skins doubled up as before, and returned into the tan, till the day following, when they are to be taken out, and well washed six times in cold water, and four times in water lukewarm. The water must be then well squeezed out, by laying the skins under pressure, for about half an hour, between two boards, with a weight of about 200 or 300 pounds laid upon the uppermost board, when they will be ready for the dye.

9. *Preparation of the Yellow Dye, in the proper proportion for four skins.* Mix six ounces of cassiari gehira (B), or dgehira, or the berries of the eastern rhamnus, with the same quantity of alum; and pound them together till they be fine, in a marble or brags mortar, with a brags pestle. Then dividing the materials, thus powdered, into three equal parts of four ounces each, put one of those three parts into about a pint and a half of water, in a china or earthen vessel; and stir the mixture together. Let the fluid stand to cool, till it will not scald the hand. Then spreading one of the skins flat on a table, in a warm room, with the grain-side uppermost, pour a fourth part of the tinging liquor, prepared as above directed, over the upper or grain-side, spreading it equally over the skin with the hand, and rubbing it well in. Afterwards do the like with the other three skins, for which the mixture first made will be sufficient.

This operation must be repeated twice more on each skin separately, with the remaining eight ounces of the powder of the berries, and slum, with the abovementioned due proportions of hot water, put to them as before directed.

The skins, when dyed, are to be hung up on a wooden frame, without being folded, with the grain-side outwards, about three quarters of an hour to drain; when they must be carried to a river or stream of run-

ning water, and well washed therein six times or more. After this they must be put under pressure for about an hour, till the water be well squeezed out; afterwards the skins must be hung up to dry in a warm room.

This being done, the skins are to be dressed and grained as before directed for those dyed red; except the oiling, which must be omitted.

*Blackening LEATHER.* In the tanning of leather it is so much impregnated with the astringent parts of oak-bark, or with that matter which strikes a black with green vitriol, that rubbing it over three or four times with a solution of the vitriol, or with a solution of iron made in vegetable acids, is sufficient for staining it black. Of this we may be convinced by dropping a little of the solution on unblacked side of common shoe-leather. This operation is performed by the currier; who, after the colouring, gives a gloss to the leather with a solution of gum-arabic and size made in vinegar. Where the previous astringent impregnation is insufficient to give due colour, and for those sorts of leather which have not been tanned, some galls or other astringents are added to the solution of iron; and in many cases, particularly for the finer sorts of leather, and for renewing the blackness, ivory or lamp-black are used. A mixture of either of these with linseed oil makes the common oil-blackening. For a shining blacking, small beer or water are taken instead of oil, in the quantity of about a pint to an ounce of the ivory-black, with the addition of half an ounce of brown sugar and as much gum-arabic. The white of an egg, substituted for the gum, makes the black more shining, but is supposed to hurt the leather, and make it apt to crack. It must be obvious, however, that all these compositions admit of a great many variations.

*Gilding of LEATHER.* Take glair of the whites of eggs, or gum water, and with a brush rub over the leather with either of them; then lay on the gold or silver, and, letting them dry, burnish them. See the articles GILDING and BURNISHING.

*To dress or cover LEATHER with Silver or Gold.* Take brown-red; grind or move it on a stone with a muller, adding water and chalk; and when the latter is dissolved, rub or lightly daub the leather over with it, till it looks a little whitish; and then lay on the leaf-silver or gold before the leather is quite dry, laying the leaves a little over each other, that there may not be the least part uncovered; and when they have well clofed with the leather, and are sufficiently dried on and hardened, rub them over with an ivory polisher, or the foretooth of a horse.

LEAVEN, a piece of four dough, used to ferment and render light a much larger quantity of dough or paste. See BREAD, BARM, and BAKING.

LEAVES of PLANTS. See LEAF.

Colours extracted from LEAVES. See COLOUR-Making, n° 36.

LEBEDA, an ancient sea-port town of Africa, in the kingdom of Tripoli, with a pretty good harbour, and an old castle; seated on the Mediterranean Sea, in E. Long. 14. 50. N. Lat. 32. 10.

LEBRIXA, an ancient, strong, and pleasant town

Leather.

Lebriza.

(B) The cassiari gehira is the berries of an Eastern rhamnus, or buckthorn-tree; and may be had at Aleppo, and other parts of the Levant, at a small price. The common Avignon or yellow berries may be substituted, but not with so good an effect; the cassiari gehira being a stronger and brighter yellow dye, both for this use, and also that of colouring paper-hangings, &c.

ebus  
bury. town of Spain, in Andalusia; seated in a territory abounding in corn, wine, and a great number of olive-trees, of whose fruit they make the best oil in Spain. W. Long. 5. 32. N. Lat. 36. 52.

LEBUS, a town of Germany, in the circle of Upper Saxony, and in the marquisate of Brandenburg, with a bishop's see, secularized in favour of the house of Brandenburg. It is seated on the river Oder, in E. Long. 14. 55. N. Lat. 52. 28.

LECCE, a rich, populous, and most beautiful town of Italy, in the kingdom of Naples and in the Terra d'Otranto, of which it is the chief place, and the see of a bishop. E. Long. 18. 20. N. Lat. 40. 38.

LECCO, a town of Italy, in the duchy of Milan, seated on the eastern side of the lake Como. E. Long. 9. 40. N. Lat. 45. 45.

LECHLADE, a town of Gloucestershire in England, seated at the confluence of the river Lech with the Thames. W. Long. 2. 15. N. Lat. 51. 42.

LECHNICH, a town of Germany in the circle of the lower Rhine, and in the electorate of Cologne. E. Long. 6. 35. N. Lat. 50. 40.

LECTICA, among the Romans, a litter or vehicle in which people were carried. The *sellæ* differed from the *lectica*, as being higher, and because people always sat in it; on which account the *sellæ*, from the time it was first brought into use, was esteemed the more honourable carriage of the two. The *lectica* was also used as a bier for carrying out the dead, who were dressed in habits suitable to their quality and sex.

LECTISTERNIUM, a religious feast or banquet of the ancient Romans. In times of public danger or calamity, or of thanksgiving for some happy event, the republic ordered solemn feasts to be made for the gods; and this solemnity was called *lectisternium*, because on this occasion they spread tables, and placed beds around them, on which their heavenly guests were to lie and eat.

LECTORES, among the Romans, servants in great mens houses, who were employed in reading while their masters were at supper. They were called by the Greeks *ANAGNOSTÆ*.

LECTOURE, an ancient and strong town of France, in Gascony, with a castle and a bishop's see; seated on a mountain at the foot of which runs the river Gers. E. Long. 0. 42. N. Lat. 43. 56.

LECTURERS, in England, are an order of preachers in parish-churches, distinct from the rector or vicar. They are chosen by the vestry, or chief inhabitants of the parish, and are usually the afternoon preachers.

The law requires, that they have the approbation and admission of the ordinary; and that, at the time of their admission, they subscribe to the 39 articles of religion, &c. required by the statute 14 Car. II. and they are to be licensed by the bishop, like other ministers.

Where there are lectures founded by the donations of pious persons, the lecturers are appointed by the founders, without any interposition or consent of rectors of churches, &c. though with the leave and approbation of the bishop; such as that of lady Moyer, at St Paul's.

LEDBURY, a town of Herefordshire in England. It is a well-built town seated on a rich clay soil, and

inhabited mostly by clothiers, who carry on a pretty large trade. W. Long. 2. 27. N. Lat. 52. 6.

LEDESMA, an ancient and strong town of Spain, in the kingdom of Leon, seated on the river Tome, in W. Long. 5. 25. N. Lat. 47. 2.

LEDGER, the principal book wherein merchants enter their accounts. See BOOK-KEEPING.

LEDUM, MARSH CISTUS, or *Wild Rosemary*; a genus of the monogynia order, belonging to the scandria class of plants. There is but one species, viz. the palustre with very narrow leaves. This grows naturally upon bogs and mosses in many parts of Yorkshire, Cheshire, and Lancashire; rising with a slender shrubby stalk about two feet high, dividing into many slender branches, garnished with narrow leaves, not much unlike those of heath. The flowers are produced in small clusters at the end of the branches, and are shaped like those of the strawberry-tree, but spread open wider at top. These are of a reddish colour, and in the natural places of their growth are succeeded by seed-vessels filled with small seeds which ripen in autumn.—This plant is with great difficulty kept in a garden; for as it naturally grows upon bogs, unless the plants have a similar soil, they will not thrive. They must be procured from the places of their growth, and taken up with good roots, otherwise they will not live.

LEE, an epithet used by seamen to distinguish that part of the hemisphere to which the wind is directed, from the other part whence it arises; which latter is accordingly called to *windward*. This expression is chiefly used when the wind crosses the line of a ship's course, so that all on a side of her is called to *windward*, and all on the opposite side to *leeward*. Hence,

Under the LEE, implies farther to the leeward, or farther from that part of the horizon whence the wind blows; as,

Under the LEE of the Shore; i. e. at a short distance from the shore which lies to windward. This phrase is commonly understood to express the situation of a vessel anchored, or sailing under the weather-shore, where there is always smoother water, and less danger of heavy seas, than at a great distance from it.

LEE-Larches, the sudden and violent rolls which a ship often takes to the leeward in a high sea, particularly when a large wave strikes her on the weather-side.

LEE-Side, all that part of a ship or boat which lies between the mast and the side farthest from the direction of the wind; or otherwise, the half of a ship, which is pressed down towards the water by the effort of the sails, as separated from the other half by a line drawn through the middle of her length. That part of the ship, which lies to windward of this line, is accordingly called the *weather-side*.

Thus admit a ship to be sailing southward, with the wind at east, then is her starboard, or right side, the *lee side*; and the larboard, or left, the *weather-side*.

LEEWARD-Ship, a vessel that falls much to leeward of her course, when sailing close-hauled, and consequently loses much ground.

To LEEWARD, towards that part of the horizon which lies under the lee, or whither the wind bloweth. Thus, "We saw a fleet under the lee," and, "We saw a fleet to leeward," are synonymous expressions.

LEE-

Leedsma  
||  
Lee.

Lee  
Leeds.

LEE-Way. See NAVIGATION, Sect. ix.

LEE (Nathaniel), a very eminent dramatic poet of the last century, was the son of a clergyman, who gave him a liberal education.—He received his first rudiments of learning at Westminster school; from whence he went to Trinity-college, Cambridge.—Coming to London, however, his inclination prompted him to appear on the theatre; but he was not more successful in representing the thoughts of other men, than many a genius besides, who have been equally unfortunate in treading the stage, although they knew so well how to write for it. He produced 11 tragedies, all of which contain a very great portion of true poetic enthusiasm.—None, if any, ever felt the passion of love more truly; nor could any one describe it with more tenderness. Addison commends his genius highly; observing, that none of our English poets had a happier turn for tragedy, although his natural fire and unbridled impetuosity hurried him beyond all bounds of probability, and sometimes were quite out of nature. The truth is, this poet's imagination ran away with his reason; so that at length he became quite crazy; and grew so bad, that his friends were obliged to confine him in bedlam, where he made that famous witty reply to a coxcomb scribbler, who had the cruelty to jeer him with his misfortune, by observing that it was an easy thing to write like a madman:—"No, (said Lee), it is not an easy thing to write like a madman; but it is very easy to write like a fool."

Lee had the good fortune to recover the use of his reason so far as to be discharged from his melancholy confinement; but he did not long survive his enlargement, dying at the early age of 34. Cibber, in his Lives of the Poets, says he perished unfortunately in a night-ramble, in London streets.—His Theodosius and Alexander the Great are stock-plays, and to this day are often acted with great applause. The late Mr Barry was particularly fortunate in the character of the Macedonian Hero.

LEECH, in zoology. See HIRUDO.

LEECHES in a ship, the borders or edges of a sail which are either sloping or perpendicular.

The leeches of all sails whose tops and bottoms are parallel to the deck, or at right angles to the mast, are denominated from the ship's side, and the sail to which they belong; as the *starboard* leech of the main-sail, the *lee-leech* of the fore-top-sail, &c. But the sails which are fixed obliquely on the masts have their leeches named from their situation with respect to the ship's length; as the *fore-leech* of the mizen, the *after-leech* of the jib or fore-stay sail, &c.

LEECH-Lines, certain ropes fastened to the middle of the leeches of the main-sail and fore-sail, and communicating with blocks under the opposite sides of the top, whence they pass downwards to the deck, serving to truss up those sails to the yard as occasion requires. See BRAILS.

LEECH-Rope, a name given to that part of the bolt-rope to which the border or skirt of a sail is sewed. In all sails whose opposite leeches are of the same length, it is terminated above the earing, and below the clue. See BOLT-ROPE, CLUE, and EARING.

LEEDS, a town of the West Riding of Yorkshire in England, in W. Long. 1. 17. N. Lat. 53. 48. It

stands on the north side of the river Aire, over which it has a stately stone bridge, hath been long famous for the woollen manufacture, and is one of the largest and most flourishing towns in the county. On a market-day one may see a long street full of standings, and these filled with cloth for sale. Of this cloth large quantities are shipped off at Hull, for Holland, Ham-burgh, and the North; whence they are dispersed through the Netherlands, Germany, Poland, &c. John Harrison, Esq; a native of this town, was a great benefactor to it, by building and endowing a church, hospital, and free-school. The corporation consists of a mayor, 12 aldermen, and 24 assistants. On the market-days, when the market-bells ring, which is at seven in the morning in winter, and six in summer, the clothiers bring out their cloth from the inns; and when the bell ceases, the chapmen come into the market, match their patterns, and in an hour's time, perhaps, bargain for 20,000*l.* worth. The bell rings again at half an hour past eight, upon which the clothiers give place to the linen-draper's, hardware-men, shoemakers, fruiterers, &c. There have been 500 loads of apples belonging to the laith of these here upon a market-day. At the same time there is an equal plenty and variety of fish and butchers'-meat exposed to sale. Great quantities also of white cloth are sold in a magnificent hall, where notice is given by a bell when the sale begins. Not only woollen goods, but coals and other commodities, are conveyed from hence by the Aire to Wakefield, York, and Hull. In a house here, called *Red-hall*, there is an apartment in which king Charles I. lodged, and which, on that account, still bears the name of the *king's chamber*. There was a castle here anciently; and now there is a stately town-hall, and parochial church called *St Peter's*. On the roof of it, the delivering of the law by Moses is finely painted in fresco. Here are also two charity-schools, a work-house, several alms-houses, and meeting-houses, one of which last, belonging to the Presbyterians, is a very handsome building. This town gives the title of *duke* to the family of Osborn, and has several medicinal springs about it.

LEEK, in botany. See ALIUM.

LEEK, a town of Staffordshire in England. It is seated in barren moor-lands, but its market is very good. W. Long. 2. N. Lat. 53. 6.

LEERWICK, the capital town of Shetland, situated in the island called the *Mainland*, in W. Long. 1. 30. N. Lat. 61. 20. It contains about 300 families.

LEES, the grossest and most ponderous parts of liquors, which, being separated by fermentation, fall to the bottom. The word comes from the French *lie*; and that either from *limus* "mud," or from *Lyeus* one of the surnames of Bacchus; or, according to du Cange, from *lia*, a corrupt Latin word, signifying the same.—The vinegar-makers make a great trade of the lees of wine dried and made into cakes, after having squeezed out the remains of the liquor in presses.

LEET, a little court held within a manor, and called the *king's court*, on account that its authority to punish offences originally belonged to the crown, from whence it is derived to inferior persons.

LEEWARD, at sea. See TO LEEWARD, above.

LEE-







LEEWARD-Islands, in the West-Indies, a name given to the CARIBBEES.

LEG, in anatomy, the whole lower extremity from the acetabula of the ossa innominata, commonly divided into three parts, viz. the thigh, the leg properly so called, and the foot. See ANATOMY, n<sup>o</sup> 59.

LEGACY, in Scots law, a donation by one person to another, to be paid by the giver's executor after his death. See LAW, N<sup>o</sup> clxxxi. 3.

LEGATEE, in Scots law, the person to whom a legacy is provided.

LEGATE, a cardinal or bishop, whom the pope sends as his ambassador to sovereign princes. See AMBASSADOR.

There are three kinds of legates, viz. legates *a latere*, legates *de latere*, and legates by office, or *legati nati*: of these the most considerable are the legates *a latere*, the next are the legates *de latere*. See the article LATERE.

Legates by office are those who have not any particular legation given them; but who, by virtue of their dignity and rank in the church, become legates: such are the archbishop of Rheims and Arles: but the authority of these legates is much inferior to that of the legates *a latere*.

The power of a legate is sometimes given without the title. Some of the nuncios are invested with it. It was one of the ecclesiastical privileges of England from the Norman conquest, that no foreign legate should be obtruded upon the English, unless the king should desire it upon some extraordinary emergency, as when a case was too difficult for the English prelates to determine.

The term *legate* comes from *legatus*, which Varro derives from *legere*, "to choose;" and others from *legare*, *delegare*, "to send, delegate."

LEGATUS, in Roman antiquity, a military officer who commanded as deputy of the chief general. The

design of the *legati* at their first institution, was not so much to command as to advise. They were chosen by the consuls, the authority of the senate concurring with their nomination. There were two kinds of *legati*, viz. a *legatus* in the army, under the emperor or general, who commanded in chief under him, and managed all affairs by his permission; and a *legatus* in the provinces under the proconsul or governor, in whose absence the *legatus* had the honour to use the fasces, and was intrusted with the same charge as the office he represented. As to the number of the *legati* we have no certainty, but may suppose that this depended upon the pleasure of the general, &c. Under the emperors, there were two sorts of *legati*; *consulares* and *prætorii*: the first of whom commanded whole armies, as the emperor's lieutenant-generals; and the others, only particular legions.

LEGEND, any idle or ridiculous story told by the Romanists concerning their saints, and other persons, in order to support the credit of their religion.

The *legend* was originally a book used in the old Romish churches, containing the lessons to be read at divine service; hence the lives of the saints and martyrs came to be called *legends*, because chapters were read out of them at mattins, and at the refectories of religious houses. Among these the *golden legend*, which is a collection of the lives of the saints, was received in the church with great applause, which it maintained for 200 years; though it is so full of ridiculous and romantic stories, that the Romanists themselves are now ashamed of it.

LEGEND is also used to signify the words or letters engraven about the margins, &c. of coins. Thus the legend of a French crown is, *Sit nomen Domini benedictum*; that of a moidore, *In hoc signo vinces*; on those of the last emperors of Constantinople, we find *Iesus Christus Basileus Basileon*, *IHS XPS NIKA*, *Iesus Christus vincit*.

## L E G E R D E M A I N,

### OR SLEIGHT of HAND;

A DENOMINATION given to certain deceptive performances, which either depend altogether on dexterity and address, or derive but a small degree of aid from philosophical principles. Of these we shall present our readers with a selection of the best that have been either explained in books, or publicly exhibited.

#### SECT. I. Performances with the Cards.

PREVIOUS to the performances with cards, it will be necessary to explain the method of *making the pass*; that is, bringing a certain number of cards from the bottom of the pack to the top; as many of these performances depend on that manœuvre.

1. Hold the pack of cards in your right hand, so that the palm of your hand may be under the cards: place the thumb of that hand on one side of the pack, the first, second, and third fingers on the other side, and your little finger between those cards that are to be

brought to the top and the rest of the pack. Then place your left hand over the cards, in such a manner that the thumb may be at C, (fig. 20, 21.) the fore-Plate C finger at A, and the other fingers at B.

The hands and the two parts of the cards being thus disposed, you draw off the lower cards confined by the little finger and the other parts of the right hand, and place them, with an imperceptible motion, on the top of the pack.

It is quite necessary, before you attempt any of the experiments that depend on making the pass, that you can perform it so dexterously that the eye cannot distinguish the motion of your hand; otherwise, instead of deceiving others, you will expose yourself. It is also proper that the cards make no noise, as that will occasion suspicion. This dexterity is not to be attained without some practice.

There is a method of preparing a pack of cards, by inserting one or more that are a small matter longer or wider



wider than the rest; which preparation will be necessary in several of the following experiments.

<sup>2</sup>  
The card of  
divination.

2. HAVE a pack in which there is a long card; open the pack at that part where the long card is, and present the pack to a person in such a manner that he will naturally draw that card. He is then to put it into any part of the pack, and shuffle the cards. You take the pack, and offer the same card in like manner to a second or third person; observing, however, that they do not stand near enough to see the card each other draws. You then draw several cards yourself, among which is the long card, and ask each of the parties if his card be among those cards, and he will naturally say Yes, as they have all drawn the same card. You then shuffle all the cards together, and cutting them at the long card, you hold it before the first person, so that the others may not see it, and tell him that is his card. You then put it again in the pack, and shuffling them a second time, you cut again at the same card, and hold it in like manner to the second person, and so of the rest (A).

If the first person should not draw the long card, each of the parties must draw different cards; when, cutting the pack at the long card, you put those they have drawn over it, and seeming to shuffle the cards indifferently, you cut them again at the long card, and show one of their his card. You then shuffle and cut again, in the same manner, and show another person his card, and so on: remembering, that the card drawn by the last person is the first next the long card; and so of the others.

This experiment may be performed without the long card, in the following manner. Let a person draw any card whatever, and replace it in the pack: you then make the pass, and bring that card to the top of the pack, and shuffle them without losing sight of that card. You then offer that card to a second person, that he may draw it, and put it in the middle of the pack. You make the pass and shuffle the cards a second time in the same manner, and offer the card to a third person, and so again to a fourth or fifth, as is more fully explained further on.

<sup>3</sup>  
The four  
confederate  
cards.

3. YOU let a person draw any four cards from the pack, and tell him to think on one of them. When he returns you the four cards, you dexterously place two of them under the pack and two on the top. Under those at the bottom you place four cards of any sort; and then, taking eight or ten from the bottom-cards, you spread them on the table, and ask the person if the card he fixed on be among them. If he say No, you are sure it is one of the two cards on the top. You then pass those two cards to the bottom, and drawing off the lowest of them, you ask him if that is not his card. If he again say No, you take that card up, and bid him draw his card from the bottom of the pack.

If the person say his card is among those you first drew from the bottom, you must dexterously take up the four cards that you put under them, and, placing those on the top, let the other two be the bottom-cards of the pack, which you are to draw in the manner before described.

(A) There is frequently exhibited another experiment, similar to this, which is by making a person draw the long card; then giving him the pack, you tell him to place his card where he pleases and shuffle them, and you will then name his card or cut the pack where it is. You may also tell him to put the pack in his pocket, and you will draw the card; which you may easily do by the touch.

4. AFTER a card has been drawn, you place it under the long card, and by shuffling them dexterously you bring it to top of the pack. Then lay, or throw, the pack on the ground, observing where the top-card lies. A handkerchief is then bound over your eyes, in such a manner however that you can see the ground, which may be easily done. A sword is then put into your hand, with which you touch several of the cards, seemingly in great doubt, but never losing sight of the top-card, in which at last you fix the point of the sword, and present it to him who drew it. Two or three cards may be discovered in the same manner, that is, by placing them under the long card, and then bringing them to the top of the pack.

5. YOU must have in the pack two cards of the same sort, suppose the king of spades. One of these is to be placed next the bottom-card, which may be the seven cards of hearts, or any other card. The other is to be placed at top. You then shuffle the cards, without displacing those three cards, and show a person that the bottom-card is the seven of hearts. Then drawing that card privately aside with your finger, which you have wetted for that purpose, you take the king of spades from the bottom, which the person supposes to be the seven of hearts, and lay it on the table, telling him to cover it with his hand. You then shuffle the cards again, without displacing the first and last card, and passing the other king of spades at the top to the bottom, you show it to another person. You then draw that privately away; and taking the bottom-card, which will then be the seven of hearts, you lay that on the table, and tell the second person, who believes it to be the king of spades, to cover it with his hand.

You then command the seven of hearts, which is supposed to be under the hand of the first person, to change into the king of spades; and the king of spades, which is supposed to be under the hand of the second person, to change into the seven of hearts; and when the two parties take their hands off, and turn up the cards, they will see, to their no small astonishment, after having so carefully observed the bottom-cards, that your commands are punctually obeyed.

6. TAKE a card, the same as your long card, and rolling it up very close, put it in an egg, by making a hole as small as possible, and which you are to fill up carefully with white wax. You then offer the long card to be drawn; and when it is replaced in the pack you shuffle the cards several times, giving the egg to the person who drew the card, and, while he is breaking it, you privately withdraw the long card, that it may appear, upon examining the cards, to have gone from the pack into the egg. This experiment may be rendered more surprising by having several eggs, in each of which is placed a card of the same sort, and then giving the person the liberty to choose which egg he thinks fit.

This deception may be still further diversified, by having, as most public performers have, a confederate, who is previously to know the egg in which the card is placed; for you may then break the other eggs, and show that the only one that contains a card is that

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that in which you directed it to be.

7. DIVIDE a piquet pack of cards into two parts by a long card. Let the first part contain a quint to a king in clubs and spades, the four eights, the ten of diamonds and ten of hearts; and let the other part contain the two quart majors in hearts and diamonds, the four sevens, and the four nines (8).

Then shuffle the cards, but observe not to displace any of those cards of the last part which are under the long card. You then cut at that card, and leave the pack in two parts. Next, present the first of those parts to a person, and tell him to draw two or three cards, and place the remainder on the table. You present the second parcel in like manner to another. Then having dextrously placed the cards drawn by the first person in the second parcel, and those drawn by the second person in the first parcel, you shuffle the cards, observing to displace none but the upper cards. Then spreading the cards on the table, you name those that each person drew; which you will very easily do, by observing the cards that are changed in each parcel.

8. ON the ace of spades fix, with soap, a heart, and on the ace of hearts, a spade, in such a manner that they will easily slip off.

Show the two aces to the company; then taking the ace of spades, you desire a person to put his foot upon it, and as you place it on the ground, draw away the spade. In like manner you place the seeming ace of hearts under the foot of another person. You then command the two cards to change their places; and that they obey your command, the two persons, on taking up their cards, will have ocular demonstration. A deception similar to this is sometimes practised with one card, suppose the ace of spades, over which a heart is placed slightly. After showing a person the card, you let him hold one end of it, and you hold the other, and while you amuse him with discourse, you slide off the heart. Then laying the card on the table, you bid him cover it with his hand. You then knock under the table, and command the heart to turn into the ace of spades. By deceptions like these, people of little experience and much conceit are frequently deprived of their money, and rendered ridiculous.

9. YOU must be prepared with two cards, like those represented by fig. 22. and with a common ace and a five of diamonds.

The five of diamonds and the two prepared cards are to be disposed as in fig. 23. and holding them in your hand, you say, "A certain Frenchman left 15,000 livres, which are represented by these three cards, to his three sons. The two youngest agreed to leave their 5000, each of them, in the hands of the elder, that he might improve it." While you are telling this story, you lay the 5 on the table, and put the ace in its place, and at the same time artfully change the position of the other two cards, that the three cards may appear as in fig. 24. You then resume your discourse, "The eldest brother, instead of improving the money, lost it all by gaming, except 3000 livres, as you here see." You then lay the ace on the table, and taking up the 5, continue your story: "The eldest, sorry for having lost the money, went to

the East-Indies with these 3000, and brought back 15,000." You then show the cards in the same position as at first, in fig. 22.

To render this deception agreeable, it must be performed with dexterity, and should not be repeated, but the cards immediately put in the pocket; and you should have five common cards in your pocket, ready to show, if any one should desire to see them.

10. TAKE a parcel of cards, suppose 40, among which insert two long cards; let the first be, for example, the 15th, and the other the 26th from the top. Seem to shuffle the cards, and then cutting them at the first long card, poise those you have cut off in your hand, and say, "there should be here 15 cards." Cut them again at the second long card, and say, "there are here only 11 cards." Then poising the remainder, you say, "here are 14 cards."

11. Several different cards being shown to different persons, that each of them may fix on one of those cards; to name that on which each person has fixed.—There must be as many different cards shown to each person as there are persons to choose: therefore, suppose there are three persons, then to each of them you must show three cards; and telling the first person to retain one in his memory, you lay those three cards down, and show three others to the second person, and so to the third. You then take up the first person's cards, and lay them down one by one, separately, with their faces upward. You next place the second person's card over the first, and in like manner the third person's card over the second's; so that in each parcel there will be one card belonging to each person. You then ask each of them in which parcel his card is; and when you know that, you immediately know which card it is; for the first person's card will always be the first, the second person's the second, and the third person's the third, in that parcel where they each say his card is.

This experiment may be performed with a single person, by letting him fix on three, four, or more cards. In this case you must show him as many parcels as he is to choose cards, and every parcel must consist of that number, out of which he must fix on one; and you then proceed as before, he telling you the parcel that contains each of his cards.

12. MAKE a ring large enough to go on the second or third finger (fig. 15-), in which let there be set a large transparent stone, to the bottom of which must be fixed a small piece of black silk, that may be either drawn aside or expanded by turning the stone round. Under the silk is to be the figure of a small card.

Then make a person draw the same sort of card as that at the bottom of the ring, and tell him to burn it in the candle. Having first shown him the ring, you take part of the burnt card, and reducing it to powder, you rub the stone with it, and at the same time turn it artfully about, so that the small card at bottom may come in view.

13. PROVIDE a mirror, either round, as A (fig. 18.), or oval, the frame of which must be at least as wide as a card. The glass in the middle must be made to

23 R move

(B) The cards may be divided in any other manner that is easy to be remembered.

move in the two grooves CD and EF, and so much of the quicksilver must be scraped off, as is equal to the size of a common card. You will observe that the glass must likewise be wider than the distance between the frame, by at least the width of a card.

Then paste over the part where the quicksilver is rubbed off, a piece of pasteboard, on which is a card that must exactly fit the space, which must at first be placed behind the frame.

This mirror must be placed against a partition, through which is to go two strings, by which an assistant in the adjoining room can easily move the glass in the grooves, and consequently make the card appear or disappear at pleasure (c).

Matters being thus prepared, you contrive to make a person draw the same sort of card with that fixed to the mirror, and place it in the middle of the pack: you then make the pafs, and bring it to the bottom; you then direct the person to look for his card in the mirror, when the confederate behind the partition is to draw it slowly forward, and it will appear as if placed between the glass and the quicksilver. While the glass is drawing forward, you slide off the card from the bottom of the pack, and convey it away.

The card fixed to the mirror may easily be changed each time the experiment is performed. This experiment may also be made with a print that has a glass before it and a frame of sufficient width, by making a slit in the frame through which the card is to pass; but the effect will not be so striking as in the mirror.

14. PLACE a vase of wood or pasteboard AB (fig. 19.) on a bracket L, fixed to the partition M. Let the inside of this vase be divided into five parts, *c, d, e, f, g*; and let the divisions *c* and *d* be wide enough to admit a pack of cards, and those of *e, f, g*, one card only.

Fix a thread of silk at the point H, the other end of which passing down the division *d*, and over the pulley I, runs along the bracket L, and goes out behind the partition M.

Take three cards from a piquet pack, and place one of them in each of the divisions *e, f, g*, making the silk thread or line go under each of them. In the division *c*, put the pack of cards from which you have taken the three cards that are in the other divisions.

Then take another pack of cards, at the top of which are to be three cards of the same sort with those in the three small divisions; and, making the pafs, bring them to the middle of the pack, and let them be drawn by three different persons. Then give them all the cards to shuffle; after which place the pack in the division *d*, and tell the parties they shall see the three cards they drew come, at their command, separately out of the vase.

An assistant behind the partition then drawing the line with a gentle and equal motion, the three cards will gradually rise out of the vase. Then take the

cards out of the division *c*, and show that those three cards are gone from the pack.

The vase must be placed so high that the inside cannot be seen by the company. You may perform this experiment also without an assistant, by fixing a weight to the end of the silk line, which is to be placed on a support, and let down at pleasure by means of a spring in the partition.

15. LET a small perspective glass be made, that is wide enough, at the end where the object-glass is placed, to hold a table similar to the following.

|       |         |        |
|-------|---------|--------|
| 1.131 | 10..132 | 19.133 |
| 2.231 | 11..232 | 20.233 |
| 3.331 | 12..332 | 21.333 |
| 4.121 | 13..122 | 22.123 |
| 5.221 | 14..222 | 23.223 |
| 6.321 | 15..322 | 24.323 |
| 7.111 | 16..112 | 25.113 |
| 8.211 | 17..212 | 26.213 |
| 9.311 | 18..312 | 27.313 |

Take a pack of cards that consists of 27 only, and giving them to a person, desire him to fix on any one, then shuffle them and give the pack to you. Place the 27 cards in three heaps, by laying down one alternately on each heap; but before you lay each card down, show it to the person, without seeing it yourself; and when the three heaps are finished, ask him at what number, from 1 to 27, he will have his card appear, and in which heap it then is? Then look at the heap through the glass, and if the first of the three numbers which stands against that number it is to appear at be 1, put that heap at top; if the number be 2, put it in the middle; and if it be 3, put it at bottom. Then divide the cards into three heaps, in the same manner, a second and third time, and his card will then be at the number he chose.

For example: Suppose he desire that his card shall be the 20th from the top, and the first time of making the heaps he say it is in the third heap: you then look at the table in the perspective, holding it at the same time over that heap, and you see that the first figure is 2; you therefore put that figure in the middle of the pack. The second and third times you in like manner put the heap in which he says it is, at the bottom, the number each time being 3. Then looking at the pack with your glass, as if to discover which the card was, you lay the cards down one by one, and the 20th card will be that he fixed on.

You may show the person his card in the same manner, without asking him at what number it shall appear, by fixing on any number yourself.

The foregoing experiments with the cards will be found sufficient to explain most others of a similar nature that have or may be made; the number of which is very great. To perform those we have described requires

(c) This experiment may be performed without an assistant, if a table be placed against the partition, and the string from the glass be made to pass through a leg of it, and communicate with a small trigger, which you may easily push down with your foot; and at the same time wiping the glass with your handkerchief, as if to make the card appear the more conspicuous. It may also be diversified, by having the figure of a head, suppose that of some absent friend, in the place of the card.



requires no great practice; the two principal points are, the making the pafs in a dexterous manner, and a certain address by which you influence a person to draw the card you present. Those that are performed by the long card are in general the most easy, but they are confined to a pack of cards that is ready prepared; whereas those which depend on making the pafs, may be performed with any pack that is offered.

SECT. II. *Experiments with Sympathetic Inks.*  
[See Sympathetic Ink †.]

EXPERIMENTS WITH CLASS I.

16. MAKE a book of 70 or 80 leaves; and in the cover at the end of it let there be a case, which opens next the binding, that it may not be perceived.

At the top of each right-hand page write any question you please; and at the beginning of the book let there be a table of all those questions, with the number of the page where each is contained. Then write with common ink, on separate papers, each about half the size of the pages in the book, the same questions that are in the book, and under each of them write, with the ink made of the impregnation of saturn, or the dissolution of bismuth, the answer.

Soak a double paper in the vivifying liquor made of quick-lime and orpiment, or the phlogiston of the liver of sulphur, and place it, just before you make the experiment, in the case that is in the cover of the book.

Then deliver some of the papers on which the questions were wrote to the company; and, after they have chosen such as they would have answered, they put them in those leaves where the same questions are contained, and, shutting the book for a few minutes, the sulphureous spirit with which the paper in the cover of the book is imbibed, will penetrate the leaves, and make the answers visible, which will be of a brown colour, and more or less deep in proportion to the time the book has been closed (p).

17. MAKE a box about four inches long, and three inches, as ABCD, and quite shallow. Let it shut with hinges and fasten with a hook; and let it have two bottoms, the lowest of wood, that draws out by a groove, and the uppermost of pasteboard. Between these two bottoms is to be placed a paper dipped in the vivifying liquor mentioned in the last experiment. Let there be also a board of the same size with the inside of the box, which being placed in it may press a paper against the pasteboard bottom.

Then take several pieces of paper, of the same size with the inside of the box, and draw on them the figures of men and women, in different attitudes and employments, as walking, riding, reading, writing, &c. These figures must be drawn with a new pen, or pencil, dipped in the impregnation of saturn.

Being thus provided, and having privately placed

the paper dipped in the vivifying liquor between the two bottoms, you tell a person you will show him what an absent friend of his is doing at the present hour. You then give him the paper adapted to the employment you intend, and tell him to write his friend's name at the bottom, that you may not change the paper. Then placing that paper next the pasteboard bottom, and putting the piece of wood over it, you shut the box. After amusing him with discourse for three or four minutes, you take out the paper, when he will see his friend in the employment you have assigned him.

18. LET a workman make a hand of wood, as in fig. 16. fixed at the end next the elbow to the piece E, the ends of which go through the screws CD and EF. The fore and middle fingers, and the thumb, are to be moveable at their joints. There must go a wire through the arm, that is fixed at one end to the fore-finger, and at the other to the piece E, round which it is to move: under the two joints of the two fingers are also placed two small springs, which are to raise it up.

To the fore-finger and thumb fix two small rings, through which a pen may be put, so as not to impede their motion. Under the arm, at the point I, place a small brass roller, which serves to sustain the arm.

The pedestal on which this hand is placed must be at least a foot long, if the hand be of the natural size, and about eight inches wide. This pedestal must be hollow, and at the part ST there must be an opening about three inches long and two inches wide; the whole pedestal may be covered with a thin stuff, by which the hole will be concealed. There is to be a valve, or sort of trap-door, on the inside of the pedestal, which is to fasten against the opening.

Over the hand and pedestal place a glass frame, as in the figure: cover the hand with fine leather of flesh colour, and decorate the arm with a ruffle and cuff, which will entirely conceal the machinery.

Then take a number of cards, and write on them different questions; and on the same number of papers write, with the impregnation of lead, the answers. Give the cards to any one, and let him choose a question; and you place the paper with the answer under the pen in the hand, letting him first see there is no writing on it (E). Now the pedestal being placed against a partition, the end F is to go through it. Therefore an assistant, upon a signal given, turns a handle fixed to F; and, as piece E turns round, the wires that move the fingers and thumb are alternately lengthened and shortened, by which their joints are kept in continual motion; and the screw at the same time turning gently from F towards G, gives the whole arm a motion which very much resembles that of nature (F).

The hand and pen serve here merely to assist the illusion: but if a bit of sponge, dipped in the vivifying liquor, be placed at the end of the pen, as it goes

23 R 2

over

† In that article, line 8. for *invisible* read *visible*.

(D). If a weight be placed upon the book, the effect will be the sooner produced. Or you may put the book in a box that will press it close down.

(E) The paper dipped in the vivifying liquor is to be previously placed against the opening in the table, and supported by the trap-door.

(F) This might be performed without an assistant, by means of a trigger placed in the leg of the table, and communicating with the handles, which the operator might thrust down with his foot. Where expence is not regarded, there may be a complete figure of a man in wood, or plaster of Paris, seated by the table.

over the writing on the paper, it will make it become gradually visible, and in this case the trap-door and and dipped paper may be omitted (c).

#### DECEPTION WITH CLASS II.

19  
The writing  
against  
the wall.

19. TAKE several pieces of paper, of a size that you can put in any book that will go into your pocket, and write at the top of each of them a question, with common ink, and under it write the answer with the solution of gold or silver. Give any of these papers, closely wrapt up, to a person, and tell him to place it against the wall of his chamber, and keeping the door locked he will next day find the answer wrote on it.

As the gold ink will sometimes give a yellow cast to the paper, you may previously give a slight tincture of that kind to the papers you use for this purpose.

#### DECEPTION WITH CLASS III.

20  
Magical  
vegetations.

20. ON different papers draw the figures of several leaves or flowers with one of the colourless juices mentioned: then take one of the corresponding leaves or flowers, and laying it on an iron plate, over a chafingdish of hot-coals, let it burn to ashes. Put these ashes into a sieve, in which there is some very fine steel filings, and sift them over the paper on which the flower is drawn, when they will adhere to the glutinous liquor, and form an exact representation of the figure of the leaf or flower.

#### DECEPTIONS WITH CLASS IV.

21  
The talis-  
man, fig. 7.

21. MAKE a little triangular box, each side of which is to be about five inches, and let its inside be divided into three parts. The first part A, which makes the bottom of the box, is to be covered by the second part B, in form of a case, and let the top C exactly cover the part B, as is expressed in the figure and the profiles.

Upon the bottom of the box let there be a plate of copper, about one twentieth of an inch thick, on which let there be a number of hieroglyphic characters, contiguous to each other, and cut in different sorts of metal.

On the top of the cover place a knob O, that goes through it, and to which the copper triangle Q is to be fixed occasionally, in such manner as it may go into the case B. There must be a space of one quarter of an inch between the triangle Q, and the bottom of the case B; into which another plate of copper, of that thickness, may be placed.

The outside of this talisman may be decorated with uncommon figures or characters, to give it the appearance of greater mystery.

On several pieces of paper, of the same size with the inside of the talisman, write different questions, in common ink, and write the answers in those different sorts of sympathetic ink, that appear when heated, observing that each word of the answer is to be wrote in a different ink.

Having properly heated the triangle, and placed it under the cover, you introduce the talisman, and tell any one of the company to choose one of the papers on which the questions are wrote, and place it in the talisman, and he will immediately have an answer

wrote on that paper, the words of which will be of different colours, according to the different metals of which the talisman is composed. The paper being placed in the talisman, and the cover placed over it, the heat of the triangle will make the answer visible in a few moments. This experiment may be repeated if the triangle be made sufficiently hot; and two papers may be placed in the talisman at the same time.

This deception, when well executed, occasions a surprize that cannot be conceived by a mere description.

22. MAKE a wooden pedestal AB, about ten inches long, eight wide, and one deep: and at one end erect a box C, about ten inches high, eight broad, and two and a half deep. The sibyl

The top of the pedestal must slide in a groove, on which inscribe a dial M, of six inches diameter, and which is to be divided into nineteen equal parts, in twelve of which write the names of the months, and mark the respective signs of the zodiac; and in the seven other divisions, which must be next the end B, write the days of the week, and mark the figures of the planets. Next the inner circle NO, make an opening into the box, of about one tenth of an inch. On the centre of the dial place an index that turns free and its centre.

Within the pedestal place a pulley P, about four inches diameter, which is to turn on an axis that is directly under the centre of the dial; and on the upper part of that axis fix a bent index R, which comes out at the opening made by the inner circle (N), and passes over those seven divisions only on which are wrote the days of the week.

Within the box C, let there be two rollers S and T, as in the figure: let that of S contain a spring; and at the end of T let there be a pulley V, of three quarters of an inch diameter, round which goes a string or thread that passes under the small pulley X, and is fastened to that of P: so that when the last pulley makes about one-third of a turn, that of V may make three or four turns.

There must also be a scroll of paper, about two feet long, and each end of which must be pasted to one of the rollers. In the front of the box, between the two rollers, make an aperture D, about four inches long, and one inch and a half wide: to this opening let there be a little flap or slider, by which it may be closed at pleasure.

The apparatus being thus disposed, place the index R successively against each of the divisions marked with one of the planets; and as the paper is gradually wound up the roller, mark, against that part which is at the aperture D, the name of one of the following sibyls:

|                  |          |
|------------------|----------|
| The Hellepontian | } sibyl. |
| Cumean           |          |
| Artemisian       |          |
| Phrygian         |          |
| Albuncean        |          |
| Perfian          |          |
| Libyan.          | }        |

(c) You may also have a glass ink-stand, with some of the vivifying liquor, into which the pen may be dipped, and it will then appear to write with common ink. The spectators should not be permitted to come very near this machine, which may be applied to several other purposes.

(h) If the axis be made to pass through the top of the pedestal, this opening will not be necessary.

On

On each of the seven cards write a different question, and draw one of the seven planets. Next, take a memorandum-book that contains seven leaves, and on each of them write the name of one of the foregoing sibyls; in each of the leaves place several pieces of paper, and on each of them write, with the sympathetic ink that does not appear till the paper is heated, different answers to the same question.

Then give a person the seven cards on which the questions are wrote, and tell him to choose one of them privately, and conceal the rest, so that it cannot possibly be known which of them he has chosen.

Next, tell him to place the index that points to the month against that in which he was born (1), and to place the index of the planets against that which is on the card he has chosen, and which is to prefigure over the answer: you tell him to do this privately, that no one may see him, and after that to cover the dial with his handkerchief. Then let him open the door that is before the aperture in the box, and tell you the name of the sibyl there visible.

You then open the memorandum-book, and taking out the papers that are in the leaf where the name of the sibyl just mentioned is wrote, you desire him to choose any one of them he thinks proper. The talisman used in the last experiment being properly heated, is then to be introduced, when you direct the person to put the blank paper into it; and taking it out a few moments after, he will find the answer to his question.

To make this operation appear the more extraordinary, it will be proper to have a small press or cupboard, at the back of which there is a door that opens into an adjoining room, by which means an assistant having prepared the talisman may place it in the cupboard the moment before it is wanted. This contrivance will be useful on many other occasions.

22. PROVIDE an urn of wood or metal about six inches high, and two and a half diameter in the widest part, and of such figure in other respects as you think proper (see fig. 9.) Let there be a cylinder of copper C, (fig. 10.) of about one-eighth of an inch diameter, which is to fill a hole AB, made in the urn. The top of this cylinder is to be in the top of the urn, so that it may be easily taken out. To this urn there must be a cover D, which fits it exactly.

On a small square piece of paper draw the figure of a flower or leaf, with that sort of sympathetic ink whose colour most resembles it. You then present several sorts of flowers or leaves to a person, and desire him to choose any one of them. Then put that flower on a chafingdish of hot coals; and, taking the paper on which it is secretly drawn, you give it to the person to examine, and then put it in the urn, having previously heated the cylinder (K). Then taking some of the ashes of the burnt flower, you strew them over the paper, after which you take it out and shew the company the figure of that flower. While the flower is burning you may sprinkle some powder over it, suppose that of saltpetre; and by that, mixed with the ashes of the flower, the company may imagine the

effect is produced.

The press or cupboard mentioned in the preceding experiment will be here very convenient for heating the cylinder and placing it in the urn. A similar deception may be performed by putting the paper in a copper vessel, that may be placed on an iron plate over the chafingdish in which the flower is burnt. But this method has not so mysterious an appearance as the other, and in some persons may cause a suspicion that the effect is produced by heat.

24. To perform this experiment you must observe, that there are several letters which may be changed into others, without any appearance of the alteration; as, cards. the *a* into *d*, the *c* into *a*, *e*, *d*, *g*, *o*, or *q*, the *i* into *b*, *d*, or *h*, the *l* into *t*, the *o* into *a*, *d*, *g*, or *q*, the *v* into *y*, &c.

Take a parcel of cards, suppose 20, and on one of them write, with the ink of the fourth class, the word *law* (L), and on the other, with the same ink, the words *old woman*; then holding them to the fire, they will both become visible. Now you will observe, that by altering the *a* in the word *law* into *d*, and adding *o* before the *h*, and *oman* after the *w*, it becomes *old woman*. Therefore, you make those alterations with the invisible ink, and let it remain so. On the rest of the cards you write any words you think fit.

Present the cards in such a manner to two persons, that one of them shall draw the word *law*, and the other the words *old woman*. You then tell the person who drew the word *law*, that it shall disappear, and the words on the other card shall be wrote in its place; and that you may not change the cards, desire each of the parties to write his name on his card. Then putting the cards together, and holding them before the fire, as if to dry the names just wrote, the word *law* will presently change into *old woman*.

This experiment may be varied by fixing on a word that may be changed into three other words, and making four persons draw the cards on which those words are wrote; and it may be further diversified by choosing three such words, as that the first can be changed into the second, and the second into the third. You then tell him who drew the first word, that it shall be changed into that drawn by the second person; and him you tell, that his word shall be changed into that of the third person.

25. Write on several slips of paper different questions, and such as may be answered by the name of some person; for example, Who is the merriest man in the company? Answer, Mr \* \* \*. To whom will Miss \* \* \* be married? Answer, To Mr \* \* \*. These questions are to be wrote in the sympathetic ink of this class, and exposed to the fire, and the answers wrote in the same ink, and left invisible. The papers are to be folded in form of letters, and in such manner that the part where the name is wrote shall be directly under the seal, and the heat of the wax will make it visible. Then give the letter to the person who requires the answer, and he will find it plainly wrote.

A deception similar to this may be made with a num-

(1) These months and the index are of no other use than to give the experiment an air of greater mystery.

(K) There are some sorts of sympathetic inks that require much more heat than others.

(L) These letters should not be joined.



number of blank cards, on each of which an ace of spades is drawn with the invisible ink; then let a person choose any one of them, and inclose it in a letter-case, prepared in such manner that the figure of the ace shall be directly under the seal, and on opening the letter it will be immediately visible.

#### DECEPTIONS with CLASS V.

<sup>26</sup> 26. HAVE a box that is divided into three parts, after the same manner as the talisman in the 21<sup>st</sup> experiment, except that instead of being triangular, it must be of a long square (see fig. 14.) Divide its top B into two equal parts D and E, as in fig. 13. and to the part D adjust a plate of copper L, about one quarter of an inch thick, and under both the plate L and the opening E place a cloth. The upper part C must have a button by which it may be fixed on the cover B, so as to appear of one piece with it.

At the bottom of the box place a piece of cloth, or other stuff, on which you may stamp certain mysterious characters, and observe that the bottom of the cover must rest upon this cloth.

Then provide a slip of paper G H (fig. 12.) of the same size with the bottom of the box; and at each end of it write, with the green sympathetic ink, the name of a different card, and make some private mark by which you can tell at which end each name is wrote (N).

Take a parcel of cards, and offer those two of them whose names are wrote on the paper to the two persons, that they may draw them. You tell the parties to keep their cards to themselves, and you propose to make the names of those cards appear upon a slip of paper, which you put into the box. You then ask which name of the two cards shall appear first. The copper plate being previously heated and placed in the cover, you put it over that end of the paper on which is the name required, and it will presently appear. Then taking the paper out and showing the name wrote, you put it in again, turning the other end to the side of the box where the plate is, and it will in like manner become visible.

The first name may be made to disappear at the same time that the second appears, if the cloth at the end opposite to that where the plate is be made damp.

<sup>27</sup> 27. TAKE a print that represents winter, and trace over the proper parts of the trees, plants, and ground, with the green sympathetic ink; observing to make some parts deeper than others, according to their distance. When those parts are dry, paint the other objects with their natural colours. Then put the print in a frame with a glass, and cover the back of it with a paper that is pasted over its border only.

When this print is exposed to the heat of a moderate fire, or to the warm rays of the sun, all the grass and foliage will turn to a pleasing green; and if a yellow tint be given to some parts of the print, before the sympathetic ink be drawn over, this green will be of different shades; and the scene that a minute before

represented winter, will now be changed to spring. When this print is placed in the cold, winter will again appear, and will again be driven away by the warm rays of the sun. This alternate change of seasons may be repeated as often as you please; remembering, however, as was before observed, not to make the print at any time too hot, for then a faded autumn will for ever remain.

#### DECEPTIONS with CLASS VII.

<sup>28</sup> 28. PROVIDE a number of artificial flowers, such as roses, jonquils, pinks, or any other you find convenient. These flowers must be made of white thread or silk, and their leaves of parchment. Dip the roses in the red sympathetic ink, the jonquils in the yellow, the pinks in the violet, and their leaves in a solution of salt of tartar. When they are all dry, form them into small bouquets, which will all appear white, and may be used in this experiment, either the day they are dipped, or several days after.

You take one of these bouquets, and after showing the company that every part of it is white, you dip it in an infusion of any of the blue flowers mentioned under the article COLOUR-MAKING, n<sup>o</sup> 13. and, drawing it presently out, all the flowers and leaves will appear in their natural colours (N).

<sup>29</sup> 29. WRITE on a paper, with the violet liquor, as many letters or words as you please; and ask any person whether he will have that writing turn to yellow, green, or red. The transcolored writing.

Have a sponge with three sides that you can readily distinguish, and dip each of its sides in one of the three sympathetic inks. Draw the side of the sponge that corresponds to the colour the person has chose, over the writing once only; and it will directly change to the colour required (O).

#### Sect. III. Miscellaneous Performances.

<sup>30</sup> 30. A person having an even number of counters in one hand, and an odd number in the other, to tell in which hand the odd or even number is. To tell odd or evens. Let the person multiply the number in his right-hand by an odd number, and the number in his left-hand by an even number, and tell you if the sum of the products added together be odd or even. If it be even, the even number is in the right hand; but if it be odd, the even number is in the left hand.

#### Example.

|                            |      |               |
|----------------------------|------|---------------|
| 1 Number in the right hand | } 18 | In the left 7 |
| Multipliers 3              |      |               |
|                            | 2    |               |
|                            | 54   | 14            |
|                            | 14   |               |
| Their sum 68               |      |               |

2 Num.

(M) That there may be no suspicion of the papers being prepared, you may cut it from a whole sheet, before the company, having previously wrote the names.

(N) The liquor should be put in a sort of jar with a narrow neck, that it may not be seen by the company; and you should draw the flowers gently out, that the liquor may drop if thin, and they may have time to acquire their colours.

(O) The sponge should be well cleaned immediately after the experiment.

<sup>26</sup> The incomprehensible writing.

<sup>27</sup> Winter changed into spring.

Their sum 57

From

From the total 712  
Subtract 250

And the three remaining figures 264  
will answer to the numbers on the dice, and shew the order in which they stand.

35 To tell on what finger, joint, &c. a ring has been privately put.  
35. *Some person in company having put a ring privately on one of his fingers; to name the person, the hand, the finger, and the joint, on which it is placed.*

Let a third person double the number of the order in which he stands who has the ring, and add 5 to that number; then multiply that sum by 5, and to the product add 10. Let him next add 1 to the last number if the ring be on the right hand, and 2 if on the left, and multiply the whole by 10: to this product he must add the number of the finger (counting the thumb as the first finger), and multiply the whole again by 10. Let him then add the number of the joint; and, lastly, to the whole join 35.

He is then to tell you the amount of the whole, from which you are to subtract 3535, and the remainder will consist of four figures, the first of which will express the rank in which the person stands, the second the hand, (the number 1 signifying the right hand, and 2 the left) the third number the finger, and the fourth the joint.

#### Example.

Suppose the person who stands the third in order has put the ring upon the second joint of the thumb of his left hand; then

The double of the rank of the third person is 6  
To which add 5

Multiply the sum by 5

To which add 10  
And the number of the left hand 2

Which being multiplied by 10

To which add the number of the thumb 1

And multiply again by 10

Then add the number of the joint 2  
And lastly the number 35

From which deducting 3535

The remainder is 3212  
Of which, as we have said, the 3 denotes the third person, the 2 the left hand, the 1 the thumb, and the last 2 the second joint.

36 The burnt writing restored.  
36. *COVER the outside of a small memorandum-book with black paper, and in one of its inside covers make a flap, to open secretly, and observe there must be nothing over the flap but the black paper that covers the book.*

Mix foot with black or brown soap, with which rub the side of the black paper next the flap; then wipe it quite clean, so that a white paper pressed against it will not receive any mark.

Provide a black-lead pencil that will not mark without pressing hard on the paper. Have likewise a small box, about the size of the memorandum-book, and that opens on both sides, but on one of them by a private method. Give a person the pencil, and a slip of thin paper, on which he is to write what he thinks proper: you present him the memorandum-book at the same time, that he may not write on the bare board. You tell him to keep what he writes to himself, and direct him to burn it on an iron plate laid on a chafingdish of coals, and give you the ashes. You then go into another room to fetch your magic box above described, and take with you the memorandum-book.

Having previously placed a paper under the flap in the cover of the book, when he presses hard with the pencil, to write on the paper, every stroke, by means of the stuff rubbed on the black paper, will appear on that under the flap. You therefore take it out, and put it into one side of the box.

You then return to the other room, and taking a slip of blank paper, you put it into the other side of the box, strewing the ashes of the burnt paper over it. Then shaking the box for a few moments, and at the same time turning it dexterously over, you open the other side, and shew the person the paper you first put in, the writing on which he will readily acknowledge to be his.

37 The trans-  
37. *TAKE two guineas and two shillings, and grind part of them away, on one side only, so that they may be but of half the common thickness; and observe that they must be quite thin at the edge: then rivet a guinea and a shilling together. Lay one of these double pieces, with the shilling upwards, on the palm of your hand, at the bottom of your three first fingers; and lay the other piece, with the guinea upward, in like manner, in the other hand. Let the company take notice in which hand is the guinea, and in which the shilling. Then as you shut your hands, you naturally turn the pieces over; and when you open them again, the shilling and the guinea will appear to have changed their places.*

38 The penetrative guinea.  
38. *PROVIDE a round tin box, of the size of a large snuff-box; and in this place eight other boxes, which will go easily into each other, and let the least of them be of a size to hold a guinea. Each of these boxes should shut with a hinge; and to the least of them there must be a small lock, that is fastened with a spring, but cannot be opened without a key: and observe that all these boxes must shut so freely, that they may be all closed at once. Place these boxes in each other, with their tops open, in the drawer of the table on which you make your experiments; or, if you please, in your pocket, in such a manner that they cannot be displaced.*

Then ask a person to lend you a new guinea, and desire him to mark it, that it may not be changed. You take this piece in one hand, and in the other you have another of the same appearance; and putting your hand in the drawer you slip the piece that is marked into the least box, and, shutting them all at once, you take



take them out. Then showing the piece you have in your hand, and which the company suppose to be the same that was marked, you pretend to make it pass through the box, and dexterously convey it away.

You then present the box, for the spectators do not yet know there are more than one, to any person in company; who, when he opens it, finds another, and another, till he comes to the last, but that he cannot open without the key, which you then give him, and retiring to a distant part of the room, you tell him to take out the guinea himself, and see if it be that he marked.

This deception may be made more surprising, by putting the key into the snuff-box of one of the company; which you may do by asking him for a pinch of his snuff, and at the same time conceal the key, which must be very small, among the snuff; and when the person who is to open the box asks for the key, you tell him that one of the company has it in his snuff-box. This part of the deception may likewise be performed by means of a confederate.

<sup>39</sup> <sup>the useful red flower</sup> 39. PROVIDE a small tin mortar, that is double, as A, (fig. 8.) whose bottom B turns round on an axis, by means of a spring which communicates with the piece C. There must be a hollow space under the false bottom. To the under-side of the bottom fasten, by a thread of fine silk, a flower, with its stalk and leaves.

Then take a flower that exactly resembles the other, and plucking it from the stalk, and all the leaves from each other, put them into the mortar, and pound them with a small pestle; after which you show the mortar to the company, that they may see the parts are all bruised.

Then taking the mortar up in your hands, you hold it over the flame of a lamp or candle, by whose warmth the flower is supposed to be reformed; and at the same time pressing the piece at C, the bottom will turn round, the bruised parts descend into the space under the bottom, and the whole flower will be at top: you then put your hand into the mortar, and easily breaking the silk thread, which may be very short as well as fine, you take the flower out and present it to the company.

There is an experiment similar to this, in which a live bird is concealed at the bottom of the mortar, and one that is dead is pounded in it; after which, by the motion of the bottom, the live bird is set at liberty. But surely the pounding a bird in a mortar, though it be dead, must produce, in persons of any delicacy, more disgust than entertainment.

<sup>40</sup> <sup>the luminous oracle</sup> 40. PROCURE a tin box ABCD, (fig. 1.) about eight inches high, four wide, and two deep, and let it be fixed on the wooden stand E. On two of the insides let there be a groove FG; and in the front an opening I, three inches wide and one high.

At the back of the box let there be a little tin door, that opens outward, by which two wax-candles M may be put in. Let the top of the box have a cover of the same metal, in which there are several holes, and which may be taken off at pleasure.

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Provide a double glass OP, (fig. 2.) constructed in the same manner as that in the last experiment. On one of its sides you are to paste a black paper, the length of which is to be divided into three parts, and the breadth into fifteen: in every two of these fifteen divisions you cut out letters, which will make in the whole three answers, to three questions that may be proposed. On the other side of the glass paste a very thin paper, and to the top fasten a small cord, by which they may be made to rise or descend in the groove FG.

Then take a slip of pasteboard RS, (fig. 3.) one inch and a half wide and three inches long, which is to be divided into fifteen equal parts similar to those of the paper OP, and cut out spaces, as in the figure, so that this paper, sliding horizontally before OP, will either cover or conceal the letters cut in that.

This pasteboard is to slide between two brass wires, and is to be fastened to one side of the box, by a string that communicates with a small brass spring; and to the other side, by a string fastened to the box by a small piece of wax, so situate that the string may be easily set at liberty by the heat of the candles placed in the box.

Take a parcel of cards, and write on them different questions, three of which are to correspond with the answers on the glass. Shuffle these cards, and let a person draw any one of the three questions. Then by raising the glass you bring the answer against the hole in the front in the box. You next place the candles in the box, the heat of which will melt the wax that holds the paper RS, which being then drawn by the spring the answer will be visible, and in proportion as the composition between the glasses becomes diluted by the increase of the heat, the letters will become more strongly illuminated.

The letters cut in the paper may be made to answer several different questions, as has been explained in other experiments; and the whole parcel of cards may consist of questions that may be answered by one or other of the three divisions in the paper.

30. MAKE a tin box ABCD, (fig. 4.) with a cover M, that takes off. Let this box be supported by a pedestal FGHI, of the same metal, and on which there is a little door L. In the front of this box is to be a glass, O.

In a groove, at a small distance from O, place a double glass of the same sort with that in the last experiment. Between the front and back glasses place a small upright tin tube supported by the cross-piece R. Let there be also a small chafingdish placed in the pedestal FGHI. The box is to be open behind. You privately place a flower (a) in the tin tube R; and presenting one that resembles it to any person (x), desire him to burn it on the coals in the chafingdish.

You then strew some powder over the coals, which may be supposed to aid the ashes in producing the flower; and then put the chafingdish in the pedestal, under the box. As the heat by degrees melts the composition between the glasses, the flower will gradually

23 S

ap-

(Q) This flower must not be placed so near the front glass, as to make it in the least degree visible.

(R) You may present several flowers, and let the person choose any one of them. In this case, while he is burning the flower, you fetch the box from another apartment, and at the same time put in a corresponding flower, which will make the experiment still more surprising.

appear; but when the chafingdish is taken away, and the power of the ashes is supposed to be removed, the flower soon disappears.

For entertaining experiments, illusions, &c. of a

philosophical nature, see ACOUSTICS, CATOPTICS, CHROMATICS, DIOPTRICS, ELECTRICITY, HYDROSTATICS, MAGNETISM, MECHANICS, PYROTECHNICS, &c.

## L E G

Leger,  
Leghorn.

**LEGER-LINE**, in music, one added to the staff of five lines, when the ascending or descending notes run very high or low: there are sometimes many of these lines both above and below the staff, to the number of four or five.

**LEGHORN**<sup>M</sup>, anciently called *Liburnus Portus*, but by the modern Italians *Livorno*, a handsome town of Italy, in the duchy of Tuscany, and a free port, about 30 miles south-west from Florence, in the territory of Pisa. The only defect of the harbour is its being too shallow for large ships. Cosmo I. had this town in exchange for Sarzana, from the Genoese; and it is the only sea-port in the duchy. It was then but a mean, unhealthy place; but is now very handsome, and well-built, with broad, straight, parallel streets. It is also well fortified; but wants good water, which must be brought from Pisa. The port, consisting of two havens, one for the duke's galleys, and the other for merchant ships, is surrounded with a double mole, above a mile and a half in length, and defended, together with the town, by a good citadel and 12 forts. Roman Catholics, Jews, Greeks, Armenians, Mahometans, and even the English factory, are indulged in the public exercise of their religion; but other Protestants must be satisfied with the private. The trade carried on here is very great, and most of it passes thro' the hands of the Jews. Though only two piasres, or scudi, are paid for every bale, great or small, imported or exported, yet the duties on all provisions and commodities brought from the continent to the town are very heavy. The number of the inhabitants is said to be about 40,000; and one half of these are Jews, who live in a particular quarter, but without any mark of distinction, and have a fine synagogue. The walks on the ramparts are very agreeable. There is good anchorage in the road; but ships riding there are much exposed to the weather and the Barbary corsairs. The number of English families in Leghorn are about 36; they are much favoured by the government, and carry on a good trade. The power of the inquisition is limited to ecclesiastical matters, and Roman Catholics. There are a great many Turkish slaves here, brought in by the duke's galleys, who are often sent out on a cruise against the corsairs of Barbary. The light-house stands on a rock in the sea; near which is the Lazaretto, where quarantine is performed. Another source, from which the duke draws a great revenue, is the monopoly of brandy, tobacco, and salt; but that, with the heavy duties, makes provisions dear. The Turks who are not slaves, live in a particular quarter, near that of the Jews. The common prostitutes also have a particular place assigned them, out of which they must not be seen, without leave from the commissary. The number of the rowers in the galleys, whether Turkish slaves, criminals, or volunteers, are about 2000. In the area before the darfena, or inner harbour, is a fine statue of duke Ferdinand, with four Turkish slaves, in bronze, chained to the pedestal. The ducal palace is one of the finest structures in the town,

## L E I

and the ordinary residence of the governor. Leghorn is the see of a bishop, and has a noble cathedral; but the other churches are not remarkable. E. Long. 11. o. N. Lat. 43. 30.

**LEGION**, in Roman antiquity, a body of foot which consisted of ten cohorts. The word comes from the Latin *legere*, to choose; because, when the legions were raised, they made choice of such of their youth as were most proper to bear arms.

The exact number contained in a legion was fixed by Romulus at 3000; though Plutarch assures us, that, after the reception of the Sabines into Rome, he increased it to 600. The common number afterwards in the first times of the free state was 4000; but in the war with Hannibal it rose to 5000; and after that it is probable that it sunk again to 4000, or 4200, which was the number in the time of Polybius.

They borrowed their names from the order in which they were raised, as *prima, secunda, tertia*; but because it usually happened that there were several *primæ, secundæ, &c.* in several places, they, on that account, took a sort of surname besides, either from the emperors who first constituted them, as *Augusta, Claudiana, Galbiana*; or from the provinces which had been conquered chiefly by their valour, as *Parthica, Scythica, Gallica, &c.* or from the names of the particular deities for whom their commanders had an especial honour, as *Minervia* and *Apollinaris*; or from the region where they had their quarters, as *Cretensis, Cyrenaica, Britannica, &c.* or sometimes upon account of lesser accidents, as *Ajutrix, Martia, Fulminatrix, Rapax, &c.*

**LEGISLATOR**, a lawgiver, or person who establishes the polity and laws of a state. Such was Moses, among the Jews; Lycurgus, among the Lacedæmonians, &c.

**LEGITIMATION**, an act whereby illegitimate children are rendered legitimate. See BASTARD.

**LEGITIME**, in Scots law, that share of the moveable effects belonging to a husband and wife, which upon the husband's death falls to the children.

**LEGUMEN**, a pod; a species of seed-vessel which has two valves or external openings inclosing a number of seeds that are fastened along one suture only. In this last circumstance the seed-vessel in question differs from that termed by botanists *siliqua*, in which the inclosed seeds are fastened alternately to both the sutures or joinings of the pod.

The seed-vessel of all the pea-bloom or butterfly-shaped flowers, the *diadelphia* of Linneus, is of this pod-kind. Such, for instance, is the seed-vessel of the pea, vetch, lupine, and broom.

**LEGUMINOUS**, an appellation given to all plants whose fruit is a legumen.

**LEIBNITZ** (Godefray-William de), an eminent mathematician and philosopher, was born at Leipzig in Saxony in 1646. At the age of 15 years, he applied himself to mathematics at Leipzig and Jena; and in 1663, maintained a thesis de *Principiis Individuationis*.

The

Legion  
Liebnitz

The year following he was admitted master of arts. He read with great attention the Greek philosophers; and endeavoured to reconcile Plato with Aristotle, as he afterwards did Aristotle with Des Cartes. But the study of the law was his principal view; in which faculty he was admitted bachelor in 1665. The year following he would have taken the degree of doctor; but was refused it on pretence that he was too young, though in reality because he had raised himself several enemies by rejecting the principles of Aristotle and the Schoolmen. Upon this he went to Altorf, where he maintained a thesis *de Cassibus Perplexis*, with such applause, that he had the degree of doctor conferred on him. He might have settled to great advantage at Paris; but as it would have been necessary to have embraced the Roman Catholic religion, he refused all offers. In 1673, he went to England; where he became acquainted with Mr Oldenburg, secretary of the royal society, and Mr John Collins, fellow of that society. In 1676, he returned to England, and thence went into Holland, in order to proceed to Hanover, where he proposed to settle. Upon his arrival there, he applied himself to enrich the duke's library with the best books of all kinds. The duke dying in 1679, his successor Ernest Augustus, then bishop of Osnaburg, shewed our author the same favour as his predecessor had done, and ordered him to write the history of the house of Brunswick. He undertook it, and travelled over Germany and Italy in order to collect materials. The elector of Brandenburg, afterward king of Prussia, founded an academy at Berlin by his advice; and he was appointed perpetual president, though his affairs would not permit him to reside constantly at Berlin. He projected an academy of the same kind at Dresden; and this design would have been executed, if it had not been prevented by the confusions in Poland. He was engaged likewise in a scheme for a universal language. His writings had long before made him famous over all Europe. Beside the office of privy-counsellor of justice, which the elector of Hanover had given him, the emperor appointed him in 1711 aulic counsellor; and the czar made him privy-counsellor of justice, with a pension of 1000 ducats. He undertook at the same time the establishment of an academy of science at Vienna; but the plague prevented the execution of it. However, the emperor, as a mark of his favour, settled a pension on him of 2000 florins, and promised him another of 4000 if he would come and reside at Vienna. He would have complied with this offer, but he was prevented by death in 1716. His memory was so strong, that in order to fix any thing in it, he had no more to do but to write it once; and he could even in his old age repeat Virgil exactly. He professed the Lutheran religion, but never went to sermon; and upon his death-bed, his coachman, who was his favourite servant, desiring him to lend for a minister, he refused, saying, *he had no need of one*. Mr Locke and Mr Molyneux plainly seem to think that he was not to great a man as he had the reputation of being; and, in truth, many of his metaphysical notions are quite unintelligible. Foreigners did for some time ascribe to him the honour of an invention, of which he received the first hints from Sir Isaac Newton's letters, who had discovered the method of fluxions in 1664 and 1665.

But it would be tedious to give the reader a detail of Leicester the dispute concerning the right to that invention.

LEICESTER, the capital of a county of the same name in England, upon the river Leire, now called *Soare*. From its situation on the Fosse-way, and the many coins and antiquities discovered here, it seems probable that it was a place of some note in the time of the Romans. In the time of the Saxons it was a bishop's see, and afterwards repaired and fortified by Edelfrida, that it became, according to Matthew Paris, a most wealthy place, having 32 parish-churches: but in Henry the Second's reign it was in a manner quite ruined, for joining in rebellion against him with Robert earl of Leicester. In the reign of Edward III. however, it began to recover, by the favour of his son Henry Plantagenet, duke and earl of Lancaster, who founded and endowed a collegiate church and hospital here. It is a borough and corporation, governed by a mayor, recorder, steward, bailiff, 24 aldermen, 48 common-council men, a solicitor, a town-clerk, and two chamberlains. It had its first charter from king John. The freemen are exempt from paying toll in all the fairs and markets of England. It has three hospitals; that mentioned above, built by Henry Plantagenet duke of Lancaster, and capable of supporting 100 aged people decently; another erected and endowed in the reign of Henry VIII. for 12 poor lazars; and another for six poor widows. The castle was a prodigious large building, where the duke of Lancaster kept his court. The hall and kitchen still remain entire, of which the former is very spacious and lofty; and in the tower over one of the gate-ways is kept the magazine for the county militia. There was a famous monastery here, anciently called, from its situation in the meadows, *St Mary de Pratris* or *Prez*. In these meadows is now the course for the horse-race. It is said that Richard III. who was killed at the battle of Bosworth, lies interred in St Margaret's church. The chief business of Leicester is the stocking-trade, which hath produced in general to the amount of 60,000 l. a-year. In a parliament held here in the reign of Henry V. the first law for the burning of heretics was made, levelled against the followers of Wickliffe, who was rector of Lutterworth in this county, and where his pulpit is said still to remain. The town suffered greatly in the civil wars, by two sieges upon the back of one another. It has given the title of earl to several noble families, and last to Thomas Coke, lord Lovel, created earl of Leicester in 1744. It has a market every Saturday. W. Lon. 1. 5. N. Lat. 52. 40.

LEICESTERSHIRE, an inland county of England, in form almost circular. It has Nottinghamshire and Derbyshire to the north; Rutlandshire and Lincolnshire on the east; Warwickshire on the west, from which it is parted by the Roman military way called *Watling-street*; and by Northamptonshire on the south. It is 33 miles long, 28 broad, and 100 in circumference; containing 560,000 acres, 112,200 inhabitants, 200 parishes, and 13 market-towns. As it lies at a great distance from the sea, and is free from bogs and marshes, the air is sweet and wholesome. It is a champaign country in general, and abundantly fertile in corn and grafs, being watered by several rivers, as the Soare, or Sore, which passes through the middle



Leighton. middle of it, and abounds in excellent salmon and other fish; the Wreke, Trent, Eyc, Senfe, Auker, and Aven. These rivers being mostly navigable, greatly facilitate the trade of the county. In some parts there is a great scarcity of fuel, both wood and coal; but in the more hilly parts there is plenty of both, together with great flocks of sheep. Besides wheat, barley, oats, and pease, it produces the best beans in England. They grow so tall and luxuriant in some places, particularly about Barton in the Beans, that they look, towards the harvest-time, like a forest: and the inhabitants eat them not only when they are green, as in other places, but all the year round; for which reason their neighbours nickname them *bean-bellies*. They have plenty of very good wool, of which they not only make great quantities of stockings, but send a great quantity unmanufactured into other parts of England. They make great profit of their corn and pulse; and likewise breed great numbers of coach and dray horses, most of the gentlemen being graziers; and it is not uncommon to rent grass-farms from 500*l.* to 2000*l.* a-year. It is in the midland circuit, and diocese of Lincoln; and sends four members to parliament, two for Leicester, and two for the county.

LEIGHTON (Robert), archbishop of Glasgow. During Cromwell's usurpation, he was minister of a church near Edinburgh, and distinguished himself by his charity, and his aversion to religious and political disputes. The ministers were then called over yearly in the synod, and were commonly asked, Whether they had preached to the times? "For God's sake," answered Leighton), when all my brethren preach to the times, suffer me to preach about eternity." His moderation, however, giving offence, he retired to a life of privacy. But soon after, he was called, by the unanimous voice of the magistrates, to preside over the college of Edinburgh; where, during 10 years, he displayed all the talents of a prudent, wise, and learned governor. Soon after the Restoration, when the ill-judged affair of introducing episcopacy into Scotland was resolved on, Leighton was consecrated bishop of Dunblane, and immediately gave an instance of his moderation: for when Sharpe and the other bishops intended to enter Edinburgh in a pompous manner, Leighton remonstrated against it; but finding that what he said had no weight, he left them, and went to Edinburgh alone. Leighton, in his own diocese, set such a remarkable example of moderation, that he was revered even by the most rigid of the opposite party. He went about, preaching without any appearance of pomp; gave all he had to the poor; and removed none of the ministers, however exceptionable he might think their political principles. But finding that none of the other bishops would be induced to join, as he thought, properly in the work, he went to the king, and resigned his bishopric, telling him he would not have a hand in such oppressive measures. Soon after, the king and council, partly induced by this good bishop's remonstrances, and partly by their own observations, resolved to carry on the cause of episcopacy in Scotland on a different plan; and with this view, Leighton was persuaded to accept of the archbishopric of Glasgow, on which he made one effort more; but finding it not in his power to stem the violence of the

times, he resigned his archbishopric, and retired into Suffolk, where he devoted himself to acts of piety. He died in the year 1684. He was of a most amiable disposition, strict in his life, polite, cheerful, engaging in his manners, and profoundly learned. He left many sermons and useful tracts, which are greatly esteemed.

LEINSTER, or LEMPSTER, a province of Ireland, called in Latin *Lagenia*, bounded by Ulster on the north, by Connaught and Munster on the west and south-west, and by the sea on the south and east. The Shannon separates it from Connaught, and the Sure from a part of Munster. Its length from north to south amounts to about 112 miles; its breadth from east to west 70; and its circumference, including the windings and turnings, to 360 miles. It contains 12 counties, viz. Louth, East-Meath, West-Meath, Longford, Dublin, Kildare, King's-county, Queen's-county, Wicklow, Catherlogh, Kilkenny, and Wexford; 90 baronies, one archbishopric, three bishoprics, 926 parishes, 47 parliamentary boroughs, and 63 market-towns and places of trade. Leinster in general is very well cultivated, enjoys a good air and soil, and abounds in corn, cattle, fish, and fowl. Its principal rivers are the Boyne, Barrow, Liffey, Nuer, Slane, or Urrin, and the May; of which the first is famous for the victory obtained on its banks by king William over king James, and gives title of *viscount* to a family of the name of *Hamilton*. The bog of Allen, the largest in the kingdom, extends almost across the whole province from east to west, the turf of which is universally esteemed the best in Ireland. This province, formerly governed by petty kings of its own, is now the most populous in the kingdom, containing the capital and seat of government. The inhabitants are also the most polite, and, in general, as zealous Protestants as any in the British dominions. Leinster gives the title of *duke* to the family of Fitzgerald, formerly earls of Kildare.

LEIPSIC, a large, strong, and populous town of Misnia in Germany, with a castle, and a famous university. It is neat, and regularly built, and the streets are lighted in the night; it carries on a great trade, and has a right to stop and sell the merchandizes designed to pass through it, and the country for 75 miles round has the same privilege. There are three great fairs every year, at the beginning of the year, Easter, and Michaelmas, which last 15 days each. There are six handsome colleges belonging to the university, besides the private colleges. The town-house makes an indifferent appearance, but the exchange is a fine structure. The town was taken by the king of Prussia in the late war, but given up by the peace in 1763. It is seated in a plain between the rivers Saale and Muld, near the confluence of the Playffe, the Elster, and the Barde. E. Long. 12. 55. N. Lat. 51. 19.

LEITH, (anciently called *Inverleith*), the port of Edinburgh, is seated on the banks of the Forth, about a mile from the capital. It is divided into two parts, called *North* and *South Leith*. The former is a part of the barony of the Canongate; and is subject to the baron-bailie of that district, and to the magistrates of Edinburgh. The communication between North and South Leith is by a stone-bridge of three arches, which appears to have been founded by Robert Balentyne,

Leinster

Leith.

lentyn, abbot of Holyrood-house, in 1493. The harbour, however, is what gives the importance to Leith, and indeed to Edinburgh also. It is formed by the conflux of the rivulet called the *Water of Leith* with the Frith of Forth. The depth of water, at neap-tides, is about nine feet; but in high spring-tides, it is about 16 feet. In the beginning of the present century, the town-council of Edinburgh improved the harbour at an enormous expence, by extending a stone-pier a considerable way into the sea. In 1753, an act was passed for enlarging and deepening the harbour of Leith; but as, no adequate means were proposed by the statute for defraying the expence, nothing was done in consequence. A plan was soon afterwards formed for enlarging the harbour upon a still larger plan; and, to carry this expensive project into execution, a bill was framed by which an additional duty from 1d. to 6d. a ton was to be laid upon all shipping in the harbour. But the scheme was dropped, in consequence of a vigorous opposition. In 1777, the town of Edinburgh considerably improved the harbour, by erecting an additional stone-quay towards its west side. Upwards of 100 ships can lie conveniently in this port. It is accommodated with wet and dry docks, and other conveniencies for ship-building, which is there carried on to some extent, as vessels come to Leith to be repaired from all parts of Scotland.

The harbour of Leith was granted to the community of Edinburgh by king Robert, in 1329; but the banks of the harbour belonged to Logan of Restalrig, a turbulent and ambitious baron, from whom the citizens were under the necessity of purchasing the bank or waste piece of ground between the houses and the rivulet abovementioned, for the purposes of wharfs, as well as for erecting shops and granaries, neither of which they could do before. As the situation of Leith, however, is much more convenient for trade than that of Edinburgh, two miles distant from the harbour, the inhabitants of the metropolis have fallen upon various methods of restraining the trade of Leith. They first purchased, from Logan of Restalrig, an exclusive privilege of carrying on every species of traffic in the town of Leith; of keeping warehouses and inns for the entertainment of strangers in that place; and in 1483, the town-council of Edinburgh prohibited, under severe penalties, the citizens of Edinburgh from taking into partnership any inhabitant of Leith. To free themselves from this oppression, the people of Leith purchased the superiority of their town from Logan of Restalrig for 3000l. Scots, and it was erected into a burgh of barony by the queen-regent, Mary of Lorraine, who promised to erect it into a royal burgh. She died, however, before this was accomplished; and upon her death, Francis and Mary, in violation of the private rights of the people of Leith, re-fold the superiority to the town of Edinburgh, to whom it has since been confirmed by grants from successive sovereigns.

On the breaking out of the disturbances at the Reformation, the queen-regent caused the whole town to be fortified, that the French troops might have a more ready inlet into the kingdom. It was accordingly surrounded with a wall, having eight battions: but this wall went no farther than the street now called *Bernard's nook*, because at that time the sea came

up the length of that street; and even as late as 1623, a house situated exactly where the weigh-house is at present, is described as bounded on the east by the "land of the sea-shore." All that space, therefore, on which the row of houses nearest the harbour of Leith now stands, has been gained since that time from the sea.

In the time of Charles I. a fortification was erected at Leith by the Covenanters. Cromwell built a strong fort at the place still called the *citadel* in North-Leith; but it was pulled down on the restoration of Charles II. by order of government. A gate with portcullises are the present remains of that fortification.—A palace also appears to have formerly stood here, situated at the north-east boundaries of the former town, on the spot where the present weigh-house stands. It was destroyed by the English in the time of Henry VIII. The remains of this building, called the *king's work*, with a garden, and piece of waste land that surrounded it, was erected into a barony by James VI. and bestowed upon Bernard Lindsay of Lochill, groom of the chamber to that prince. He is said to have fully repaired, and appropriated it to the recreations of the court; but it soon fell from its dignity, and became subservient to much more ignoble purposes. The tennis-court was converted into a weigh-house; and the street which bounds it still bears the name of the founder, from whom it is called *Bernard's nook*.

As Leith lay within the parish of Restalrig, the church of Restalrig was of consequence the place of worship for the inhabitants of Leith; but in 1650 the assembly ordered that church to be pulled down as a monument of idolatry, so that Leith wanted a parish-church for upwards of 50 years. During that period they resorted for worship, to a large and beautiful chapel already built, and dedicated to St Mary, which is now called *South-Leith church*; and in 1609 this chapel was by authority of parliament declared to be the parish-church of the district, so that Restalrig is now in the parish of South-Leith, as the latter was formerly in that of Restalrig. In 1772, a chapel of Ease was erected by the inhabitants, as the parish-church was insufficient to contain the number of hearers. Its dimensions are 72 feet by 52 within the walls, and it can accommodate 1500 persons. There is also an episcopal and several dissenting congregations in Leith. North-Leith is a parish by itself, and the church is situated at the south-end of the bridge.

Though a very great trade is carried on between Leith and many foreign ports, yet the articles of export and import fluctuate so much, that no quantity can be settled upon as an average, at least without having a table of exports and imports for such a number of years as is perhaps impossible to be obtained. The following is an account of the number of ships, &c. employed in the foreign and coasting trades, for one year ending January 5th 1778, taken from Mr Arnot's History of Edinburgh.

#### Foreign Trade,

| Ships | Tons | Men |
|-------|------|-----|
| 52    | 6800 | 418 |

#### Coasting and Fishing Trade,

| Ships | Tons | Men |
|-------|------|-----|
| 44    | 3346 | 281 |

N. B.

*N. B.* It is to be observed, that besides the vessels belonging to Leith, there are employed in the trade, ships belonging to other ports on the Frith; and to the north of England, to the amount of about one fourth of the tonnage of the Leith vessels. Ships in the London trade make, at an average, seven voyages up, and as many down, every two years.

The following is an account of the articles of import and export to and from the port of Leith, taken from the same work.

## IMPORTS.

*From Denmark.* Considerable quantities of oats, pease, and barley, when the port is open: small quantities of butter, cheese, old iron, and seal-iron.

*From Norway.* Deals, about 15,000 annually; battens, spars, handspikes, oak-spokes for cart-wheels; harrow-bills, haxel-cuts, fir-timber, middle balks, small balks, pailing boards, wood-hoops for coopers; oak-knees for ships; tar, in 1777 3000 barrels; oak-timber, bar-iron, oars, tree-nails, flock-fish, barley, sieve-rims.

*From Sweden.* Bar-iron, about 400 tons annually; deals, about 10,000 annually; battens; tar, in 1777 about 600 barrels; barrel-flaves, handspikes, spars, pailing boards, fir-timber, oats, barley.

*From Russia.* Bar-iron, about 600 tons annually; deals, in 1777, 35,000; battens, in 1777, 12,000; fir-timber; flax, about 250 tons annually; hemp, cordelia; tallow, in 1777, 200 tons; hogs-bristles, mats, wheat, oats, barley, ships masts, spars, sieve-rims, feather-beds, oak-timber, a considerable quantity of linens of different kinds; flax-feed, about 1000 barrels annually; cordage, elk's hair, old iron, furs, knees of oak for ships; handspikes, neats-tongues, ifinglass, indigo, rosin; tar, in 1777, 1100 barrels; tallow-caudles, hard-soap, pearl-ashes, sail-cloth, pailing boards.

*From Prussia.* Fir-timber, in 1777, 1200 loads; deals, battens, pipe and barrel staves; wheat, oats, barley, pease, pearl-ashes, flax, hemp, bar-iron, seal-iron, old iron, ships masts, linen-yarn, weed-ashes, pot-ashes, ox and cow-hides, calves-skins.

*From Poland.* Weed-ashes, pearl-ashes, and pot-ashes; oak-plank, in 1777, 115 loads; oak-timber, clap-boards, barrel and kilderkin staves; pipe and hoghead staves; salt-petre, honey, spruce-beer, hogs-bristles, wheat, deals, feathers for beds, tree-nails, linens, linen-yarn, linen-rags, ox and cow-hides, calves-skins, beech and elm timber, oats, barley, pease.

*From Germany.* Oak-timber, in 1777, 116 loads; oak-plank, in 1777, 37 loads; oak-bark, linen-rags, wheat, oats, barley, beans and pease, apples; linen-yarn, in 1777, 116 tons; oak-knees, for ships; earthen ware, pearl-ashes, smalt, Rhenish wine, vinegar; pipe, hoghead, and barrel staves; firkin-flaves, chestnuts, madder; tanned leather, in 1777, 11000 pounds; seal-skins, mineral waters, beech-timber, calf-pelts, horse-hides, mats, flax-feed, bar-iron, linens, wood-hoops, wooden clocks, tree-nails, caraway-seeds, juniper-berries, drugs.

*From Holland.* Flax, about 350 tons annually; flax-feed, about 500 hogheads annually; madder, clover-feed, mats, wood-hoops for coopers; linen-yarn, in 1777, 11,330 pound weight; old-iron, bat-

ter and cheese, cinnamon, unbound books, garden-seeds, tanned leather, wheat, oats, barley, pease and beans, pearl-ashes, smalt, wainfcoats, Rhenish wine, oak-bark, iron nails, cork, bridges thread, inele, wood-ashes, galley-tiles, writing paper, wooden clocks, taras, oakbum, saccharum saturni, white-lead, mineral waters, flower-roots, burrs for mill-stones, goose-quills, liquorice-juice, onions, hard soap, linen-rags, oak-timber, goat-skins, red-lead, apples, vinegar.

*From France.* Wine, walnuts, chestnuts, prunes, cork, brandy, pickles, apples, olives, fuccads, capers, anchovies, dried plums, almonds, salt, rosin, vinegar, verdigrease.

*From Spain.* Wine and oil, grapes, figs, almonds, raisins, lemons and oranges, salt, cork, brandy, Jesuits-bark, cow-hides, reeds, lemon-juice, drugs, rosin, and turpentine.

*From Portugal.* Wine and oil, raisins, cork, salt, lemons and oranges, figs, reeds, onions, fumach, drugs, succads, rosin.

*From Guernsey.* French, Spanish, and Portuguese wines; rosin, cork, apples and pears; brandy, chestnuts and walnuts; pickles, capers, olives, anchovies, cows, cyder, prunes.

*From Ireland;* butter.

*From Gibraltar.* Spanish and Portuguese wines.

*From Italy.* Drugs, Levant wine, currants, fald-oil, rough and polished marble, gum-arabic, cheese, anchovies, brimstone.

*From Sicily;* salt.

*From North America,* (before the differences with our colonies.) Rice, indigo, tar, pitch, turpentine, pine-plank, lignum-vite, barrel and hoghead staves, ox and cow hides, deer-skins, otter and racoon skins, logwood, mahogany, fir-plank, fago-powder, muscovado sugar, rum.

*From the West Indies.* Rum, muscovado sugar, indigo, cotton-wool, cow-hides, mahogany, logwood, and fusile; coffee-berries, succads, pimento.

## EXPORTS.

*To Denmark.* Coals, rod-iron, fire-grates, thread-stockings.

*To Norway.* Lead, earthen-ware, strong beer, glass-bottles, tow, printed linen, printed paper, tanned leather, hard-ware, woollen drapery, bricks, wheat, flour, small coals, malt, haberdashery.

*To Sweden.* Hard-ware, woollen drapery, cotton-stuffs, velverets, worsted hose, silk-stuffs, porter, stone-ware, lead, tanned leather.

*To Russia.* Coaches and chariots, with braces and harness, silk-stuffs, household-furniture, saddlery-ware, coals, Spanish salt, strong-beer, glass-bottles, checked linen furniture, diaper, velvets, worsted stockings, printed linen handkerchiefs, fine linen, clocks, haberdashery, hard-ware, oil of vitriol, sal-ammoniac, wine.

*To Poland.* Coaches and chariots, with braces and harness; silk-stuffs, alum, worsted stockings, rum, herrings, mahogany furniture, stone-ware, small coals, hats.

*To Germany.* Household furniture, glass-bottles, porter and strong-beer, oil of vitriol, earthen ware, millenary ware, rum, coals, sail-cloth, lead, carpeting, worsted stockings.

*To Holland.* Lead, in 1776, 1650 tons; in 1777, 1,500



1500 tons; salmon, porter and strong-beer; carpeting, coals, oil of vitriol, Spanish and French wines a small quantity, steel, rod-iron, velvet, rum, silks, woollen cloth, earthen ware, fire-grates, saddlery.

*To France.* Coaches and chariots, with braces and harness; a few.

*To Spain.* Linens and damasks; strong-beer and porter; iron-hoops, small coals, sail-cloth, tarred cordage, wheat, flour, stone-ware, small-beer, deals and cuts of deals, barley, glass-bottles, silk-gauze.

*To Portugal.* Glass-bottles, strong-beer, packing-mats, sail-cloth, barley and big; wheat, wheat-flour, iron-hoops, pipe-falves, dried cod-fish, small coals.

*To Gibraltar.* Coals and bricks, linens, glass-bottles, household furniture, beer and porter, iron-hoops.

*To Guernsey;* coals, glass-bottles.

*To Ireland;* porter and strong-beer, barrel-staves, glass-bottles, biscuit.

*To North America,* (before the differences with that country.) Great quantities of linen; household furniture, wearing apparel, writing-paper, printing and brown paper, books, haberdashery, stone-ware, porter and strong-beer, saddlery-ware, worsted hose, thread ditto, sewing-thread, wrought iron, hats, coats, spades, scythes, and corn-hooks; waggon-wheels, window-glass, cordage and sail-cloth, bricks, shoes, carpeting, lawns and gauzes, printed linen handkerchiefs, mens shirts, clocks; French, Spanish, and Portuguese wines; glass-bottles.

*To the West Indies.* Linens, herrings, household furniture, wood hoops for coopers, coals and bricks; French, Spanish, and Portugal wines; negroes, cloathing, hats, shoes, saddlery ware, thread-hose, sewing-thread, sugar-boilers, nails, strong-beer and porter, haberdashery, smiths and joiners tools, ploughs and furniture, yelthin pots, blistered steel, iron crows, mule-harness, fish-oil, medicines, chaifes with harness, sail-cloth and cordage, lime and lime-stones, linen handkerchiefs, wearing apparel, wheat-flour and bread, woollen drapery, ling-fish; hulled barley, oats, peas, and beans; horses, writing-paper, books, blanketing, iron-hoops, stationary ware, ships anchors, cast-iron work, window-sashes, cutlery-ware.

Oysters began to be exported from Leith for London in the year 1773. They are taken from their beds in the Forth to the Medway and other rivers in the neighbourhood of London, where they fatten for the consumption of that metropolis. This oyster-trade is carried on with so much avidity, that, according to Mr Arnot, if the banks on the Forth are not more sparingly dragged, they must of necessity be soon exhausted. As the quantity exported hath diminished, however, the price hath increased. The first year the oysters were sold at 4s. per barrel.

The shipping at Leith render the demand for ropes, sail-cloth, and cordage, very considerable. There are three different companies who carry on these manufactures, besides some private persons who deal less considerably. The first of these companies was established in the beginning of the present century; and about 12 years ago made, perhaps, larger dividends among the partners than any trading or manufacturing company in the nation. The three companies at present employ about 150 weavers, flax-dressers, and spinners

of rope-yarn, 60 rope-makers, and 450 spinners of flax.

In the middle of the last century, a manufactory of green glass was established at the citadel of Leith. Chopin-bottles were sold at 4s. 6d. per dozen, and other bottles in proportion. Soon afterwards this article was manufactured also in North Leith; and, in 1707, chopin-bottles were sold at 2s. 6d. per dozen, and so proportionably. The present Bottle-house Company was established in 1746. They began work in the bottle-house of North-Leith; but that house being burned down during the first year of the partnership, a new house was built on South-Leith sands in 1747, and an additional one in 1764. The annual expence of both houses is between 8000 or 9000l.

The manufactures of soft-soap and candles were erected by William St Clair of Roslin and some merchants; the former in 1750, and the latter in 1770; a manufactory of hard-soap was also established in 1770 by David Neilson. Besides these, there is also a sugar-house, and a considerable manufactory for making cards with which wool is combed.

The inhabitants of Leith were divided into four classes; and these erected into corporations by the queen dowager, Mary of Lorraine. These were mariners, maltmen, trades, and traffickers. The first of these consisted of ship-masters and sailors; the second of malt-makers and brewers; the third of coopers, bakers, smiths, wrights, &c.; and the fourth, of merchants and shop-keepers. Of these corporations the mariners are the most considerable. They obtained from Mary of Lorraine a gift, afterwards ratified by William and Mary, of one penny duty on the ton of goods in the harbour of Leith, for the support of their poor. This duty, which not many years ago did not amount to 40l. a-year, now rises from 70l. to 120l. as trade flourishes. For the same purpose the ship-masters also pay 6d. a-pound out of their own wages annually; and the like sum they give upon the wages of their sailors. From these and other donations, this corporation is enabled to pay from 600l. to 700l. a-year to their poor. Opposite to South-Leith church there is a large house belonging to them, called the *Trinity hospital*, because originally consecrated to the Holy Trinity. In this house some of their poor used formerly to be maintained, but now they are all out-pensioners. Besides other apartments, this hospital contains a large handsome hall for the meetings of the corporation. Adjoining to the school-house there is another hospital, called *king James's hospital*; and bears upon its front the cipher and arms of that prince. Here some poor women belonging to the other corporations are maintained.

As the town of Leith was very ill supplied with water, and the streets were neither properly cleaned nor lighted, an act was passed for remedying these defects in the year 1771, appointing certain persons from among the magistrates of Edinburgh, lords of session, inhabitants of Edinburgh and Leith, and members of the corporations of Leith, *commissioners of police*; empowering them to put this act in execution; and, for that purpose, to levy a sum not exceeding 6d. in the pound upon the valued rent of Leith. The great change which has since taken place on the streets of Leith shows the good effect of this act; and that it hath

Leland. both been judiciously prepared, and attentively executed.

LELAND (John), the great English antiquary, was born in London, about the year 1507. Having lost his parents when a child, he had the good fortune to find a friend and patron in one Mr Thomas Miles, who placed him in St Paul's school, of which the grammarian Lillye was master. From that school he was sent to Christ's college, Cambridge; whence, after some years residence, he removed to All-Souls, Oxford. From Oxford he went to Paris, chiefly with a design to study the Greek language, which at that time was but little understood in this kingdom. On his return to England he took orders, and was soon appointed chaplain to king Henry VIII. who also gave him the rectory of Poppeling, in the marshes of Calais, appointed him his librarian, and in 1533 granted to him, by commission under the great seal, the office of king's antiquary; an office never borne by any other person before or since. By this commission he was empowered to search for ancient writings in all the libraries of colleges, abbeys, priories, &c. in his majesty's dominions. We are told by his last biographer, that he renounced popery soon after his return to England; but he quotes no authority. Be this as it may, in 1536, he obtained a dispensation to keep a curate at Poppeling, and set out on his journey in search of antiquities. In this employment he spent six years, during which time he visited every part of England where monuments of antiquity were to be expected. After his return, in the year 1542, he was presented by the king to the rich rectory of Haseley in Oxfordshire; and in the following year he gave him a prebend of King's-college, now Christ's church, in Oxford, besides that of east and west Knowle, in the cathedral of Salisbury. Being thus amply provided for, he retired to a house of his own in the parish of St Michael le Querne in London, where he spent six years more in digressing the materials which he had collected. King Henry VIII. died in 1547; and in a short time after, poor Leland lost his senses. He was at first seized with a deep melancholy, which was succeeded by a total deprivation of his reason. In this dreadful state he continued till the beginning of the year 1552, when he was happily released by death. He was buried in the church of St Michael le Querne, which was destroyed by the fire in 1666. Mr Leland is remembered as a man of great learning, an universal linguist, an excellent Latin poet, and a most indefatigable and skilful antiquary. On his death, king Edward VI. gave all his papers to Sir John Cheeke, his tutor and Latin secretary of state. The king dying, and Sir John being obliged to leave the kingdom, he gave four folio volumes of Leland's collections to Humphrey Purefoy, Esq; which, in 1612, were by his son given to William Burton, author of the history of Leicestershire. This gentleman also became possessed of the Itinerary in 8 vols fol. which, in 1632, he deposited in the Bodleian library. Many other of Leland's manuscripts, after the death of Sir John Cheeke, fell into the hands of lord Paget, Sir William Cecil, and others, which at last fortunately came into the possession of Sir John Cotton. These manuscripts were of great use to all our subsequent antiqua-

rians, particularly Cambden, Sir William Dugdale, Stowe, Lambard, Dr Batteley, Ant. Wood, &c. His Itinerary throughout most part of England and Wales, was published by Mr Hearne, 9 vols 8vo, in 1710-11; as was also his *Collectanea de rebus Britannicis*, 6 vols 8vo, in 1715.

LELY (Sir Peter), an excellent painter, born in Wethphalia, in the year 1617. He was placed as a disciple with Peter Grebber at Haerlem; and in 1641 was induced, by the encouragement Charles I. gave to the fine arts, to come to England: he became state-painter to Charles II., who knighted him; and being as complete a gentleman as a painter, that king took pleasure in conversing with him. He practised portrait-painting, and succeeded so well that he excelled all his contemporaries; on which account he was always involved in business. Yet the critics remark, that he preferred in almost all his female faces a drowsy sweetness of the eyes peculiar to himself; for which he is reckoned a mannerist. The hands of his portraits are remarkably fine and elegantly turned; and he frequently added landscapes in the back-grounds of his pictures, in a style peculiar to himself, and better suited to his subject than most men could do. He excelled likewise in crayon-painting. He died in 1680.

LEMBERG, a town of Poland, capital of Red Russia, seated in the palatinate of Lemburg, on the river Pelteu. It is pretty well fortified, and defended by two citadels, one of which is seated on an eminence without the town. The square, the churches, and the public buildings, are magnificent; and it is a large and rich trading place. It has a Roman-Catholic archbishop, and an Armenian as well as a Russian bishop; but the Protestants are not tolerated. This city was reduced to the last extremity by the rebel Cossacks and Tartars, and was forced to redeem itself with a large sum of money. In 1672, it was besieged in vain by the Turks; but in 1704, was taken by storm by Char. XII. of Sweden. E. Long. 24. 46. N. Lat. 49. 51.

LEMERY (Nicholas), a celebrated chemist, born at Rouen in Normandy in 1645. After having made the tour of France, he, in 1672, commenced an acquaintance with M. Martyn apothecary to Monsieur the Prince; and performed several courses of chemistry in the laboratory of this chemist at the Hotel de Conde; which brought him to the knowledge and esteem of the prince. He provided himself at length with a laboratory of his own, and might have been made a doctor of physic: but he chose to continue an apothecary, from his attachment to chemistry, in which he opened public lectures; and his confluence of scholars was so great as scarcely to allow him room to perform his operations. The true principles of chemistry in his time were but ill understood; Lemery was the first who abolished the senseless jargon of barbarous terms, reduced the science to clear and simple ideas, and promised nothing that he did not perform. In 1681, he was disturbed on account of his religion; and came to England, where he was well received by Charles II.: but affairs not promising him the same tranquillity, he returned to France, and sought for shelter under a Doctor's degree; but the revocation of the edict of Nantz drove him into the Romish communion to avoid persecution. He then became associate chemist and pensionary in  
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the royal academy of sciences, and died in 1715. He wrote, A course of chemistry; An universal pharmacopœia; An universal treatise of drugs; and, A treatise on Antimony."

LEMING, in zoology. See Mus.

LEMMA, in mathematics, a proposition which serves previously to prepare the way for the more easy apprehension of the demonstration of some theorem, or construction of some problem.

LEMNA, DUCK-MEAT; a genus of the diandria order, belonging to the monœcia class of plants. There are three species, all natives of Britain, growing frequently in ditches and the shallow parts of stagnant waters. All of them are acceptable food for ducks and geese.

LEMNIAN EARTH, *Terra Lemnia*, a medicinal, astringent sort of earth, of a fatty consistence and reddish colour; used in the same cases as ROSE. It has its name from the island of Lemnos, whence it is chiefly brought. Many form it into round cakes, and impress a seal upon it; whence it is also called *terra figillata*.

LEMNIUS (Lævinus), a famous physician, born at Zirc-Zee in Zealand, in 1505. He practised physic with applause; and after his wife's death being made priest, became canon of Zirc-Zee, where he died in 1560. He left several esteemed works, the principal of which is entitled *De occultis naturæ miraculis*.

LEMNOS, (anc. geog.) a noble island in the Ægean sea, near Thrace, called *Dipolis*, from its consisting of two towns, into the forum of which mount Athos casts its shadow at the solstice, (Pliny); in compass 112 miles. An island sacred to Vulcan, (Val. Flaccus.) Famous for its astringent earth, used for consolidating wounds.

LEMON, in botany. See CITRUS.

LEMONADE, a liquor prepared of water, sugar, and lemon or citron juice; it is very cooling and grateful.

LEMUR, or MAKI, in zoology, a genus of quadrupeds belonging to the order of primates, the characters of which are these: There are four fore teeth in the upper jaw, the intermediate ones being remote; and six long, compressed, parallel teeth in the under jaw; the dog-teeth are solitary, and the grinders are somewhat labated. There are five species, viz.

1. The tardigradus, a small animal found in the island of Ceylon. It is of a very singular construction, and perhaps longer in proportion to its thickness than any other quadruped. The head is roundish, with a prominent nose; the legs are long and thick, and the feet resemble those of a monkey; it has no tail. It lives in the woods, and feeds on fruits; is a tender animal; has the sense of smell very acute, and the action of an ape; and is very agile, though its name implies the contrary.

2. The mongoose inhabits Madagascar and the islands to the eastward as far as Celebes, is about the size of a cat; hath the whole upper part of the body covered with long, soft, and thick fur, a little curled or waved, of a deep brownish ash-colour; the tail very long, covered with the same sort of hair, and of the same colour. It lives on fruits, turns its tail over its head to protect it from rain, and sleeps on trees; it is very sportive and good-natured, and very tender.

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3. The catia, or arch-tailed maki, inhabits Madagascar and the neighbouring isles. It is of the size of a cat; has the hair on the top and hind-part of the head of a deep ash-colour, the back and sides reddish, the belly and insides of the limbs white; all its hair very soft, close and fine, and erect like the pile of velvet; the tail is twice the length of the body. It is very good-natured, and has all the life of a monkey, without its mischievous disposition; it is very cleanly, and has a weak cry. In a wild state they go in troops of 30 or 40, and are easily tamed when taken young.

4. The caudatus niger, or rusted maki, is also an inhabitant of Madagascar. It is somewhat larger than the last, and hath long hair standing out round the sides of the head like a ruff; a long tail; the colour of the whole animal generally black, but sometimes white spotted with black. In a wild state it is very fierce; and makes such a violent noise in the woods, that the cries of two might be easily mistaken for the noise made by a hundred.

5. The volans, or flying maki, resembles a bat; being furnished with a strong membrane like that animal, by which it is enabled to fly. It inhabits the country about Guzarat, the Molucca isles, and the Philippines; feeds on the fruits of the trees, and is very distinct both from the bat and flying squirrel. Its history, however, is very little known.

LEMURES, in antiquity, sprites or hobgoblins; restless ghosts of departed persons, who return to terrify and torment the living.—These are the same with larvæ, which the ancients imagined to wander round the world, to frighten good people, and plague the bad. For which reason, at Rome they had lemuria, or feasts instituted to appease the manes of the deceased.

LEMURIA, or LEMURALIA, a feast solemnized at Rome on the ninth of May, to pacify the manes of the dead, or in honour of the lemures.—The institution of this feast is ascribed to Romulus, who, to rid himself of the phantom of his brother Remus (whom he had ordered to be murdered) appearing always before him, ordained a feast called after his name *remuria*, or *lemuria*.—In the lemuria, they offered sacrifices for three nights together; during which time all the temples of the gods were shut up, nor were any marriages permitted. There were a world of ceremonies in this feast, chiefly intended to exorcise the lemures, and prevent their appearing or giving any disturbance to the living.

LENA, a great river of Siberia in Asia, which takes its rise in N. Lat. 52. 30. and E. Long. 124. 30. from Ferro. After traversing a large tract of land, it divides itself into five branches about Lat. 73°. Three of these run westward, and two eastward, by which it discharges itself into the icy Sea. Its three western mouths lie in 143° E. Long. from Ferro, but the eastern ones extend to 153°. The current is every where slow, and its bed entirely free from rocks. The bottom is sandy, and the banks are in some places rocky and mountainous. Sixteen large rivers fall into the Lena during its course to the northern ocean.

LENÆA, in antiquity, a festival of Bacchus, surnamed *Lenæus*, from a wine-press. Besides the usual ceremonies at feasts sacred to this god, it was remark-



Lenfant,  
Lenglet.

able for poetic contentions, and the acting of tragedies.

LENFANT (James), a learned French writer born in 1661. After studying at Saumur, he went to Heidelberg, where he received imposition of hands for the ministry in 1684. He discharged the functions of this character with great reputation there, as chaplain of the electress dowager of Palatine, and pastor in ordinary to the French church. The descent of the French into the Palatinate obliged our author to depart from Heidelberg in 1688. He went to Berlin, where the elector Frederic, afterward king of Prussia, appointed him one of the ministers. There he continued 39 years, distinguishing himself by his writings. He was preacher to the queen of Prussia, Charlotta Sophia; and after her death, to the late king of Prussia. In 1707, he took a journey to England and Holland, where he had the honour to preach before queen Anne; and might have settled in London, with the title of *chaplain to her majesty*. In 1712 he went to Helmstedt, in 1715 to Leipzig, and in 1725 to Breslaw, to search for rare books and MSS. It is not certain whether it was he that first formed the design of the *Bibliothèque Germanique*, which began in 1720; or whether it was suggested to him by one of the society of learned men, which took the name of *Anonymus*, and who ordinarily met at his house. He died in 1728. His principal works are, 1. The history of the Council of Constance, 2 vols 4to. 2. A history of the Council of Pisa, 2 vols 4to. 3. The New Testament translated from the Greek into the French, with Notes by Beausobre and Lenfant, 2 vols 4to. 4. The history of pope Joan, from Spanheim's Latin dissertation. 5. Several pieces in the *Bibliothèque Choisey, La Republic des Lettres, La Bibliothèque Germanique*, &c.

LENGLET (Nicholas du Fresnoy, l'abbé), born at Beauvais in France, 1674, was a most fertile and useful French author on a variety of subjects, historical, geographical, political, and philosophical. The following deserve particular notice, 1. A method of studying history, with a catalogue of the principal historians of every age and country, published in 1713; a work which established his reputation as an historical writer: it was translated into most of the modern languages, particularly our own, with considerable improvements, by Richard Rawlinson, LL.D. and F.R.S. and published at London in 1730, in 2 vols 8vo. 2. A copious abridgment of universal history and biography, in chronological order, under the title of *Tablettes chronologiques*; which made its first appearance at Paris in 1744, in 2 vols small 8vo, and was universally admired by the literati in all parts of Europe. The author attended with great candour, as every writer ought, to well-founded, judicious criticisms. In future editions, he made several alterations and improvements, and from one of these, we believe that of 1759, an English translation was made, and published at London in 1762, in 2 vols large 8vo. Du Fresnoy died in 1755: the Paris edition of 1759 was printed from the author's corrected copy; and the impression being sold off, another edition appeared in 1763, with considerable improvements by an unknown editor: to the biographical part, a great number of names of respectable persons are added, not to be found in the former edition; and it has this superior advantage in the hi-

storical parts, that the general history is brought down to the year 1762. Du Fresnoy, however, has loaded his work with catalogues of saints, martyrs, councils, synods, heresies, schisms, and other ecclesiastical matters, fit only for the libraries of popish convents and seminaries.

LENGTH, the extent of any thing material from end to end. In duration, it is applied to any space of time whether long or short.

LENGTHENING, in ship-carpentry, the operation of cutting a ship down across the middle, and adding a certain portion to her length. It is performed by sawing her planks asunder in different places of her length, on each side of the midship-frame, to prevent her from being too much weakened in one place. The two ends are then drawn apart to a limited distance; which must be equal to the proposed addition of length. An intermediate piece of timber is next added to the keel, upon which a sufficient number of timbers are erected, to fill up the vacancy produced by the separation. The two parts of the keelson are afterwards united by an additional piece which is scored down upon the floor-timbers, and as many beams as may be necessary are fixed across the ship in the new interval. Finally, the planks of the side are prolonged to as to unite with each other; and those of the ceiling refitted in the same manner; by which the whole process is completed.

LENEICIA, a strong town of Poland, and capital of a palatinate of the same name, with a fort seated on a rock. The nobility of the province hold their diet here. It stands in a morass on the banks of the river Bura, in E. Long. 19. 25. N. Lat. 52. 12.

LENEX, or DUMBARTON-Shire, a county of Scotland, stretching 24 miles in length and 20 in breadth, is bounded on the south by the river and frith of Clyde, on the west by Lochlong and Argyllshire, on the north by the Grampian hills, and on the east by Monteith and Stirlingshire. Great part of this county consists of hills and heaths, fit for nothing but pasturage and sport; even in the lower lands, the soil is not extremely fertile: yet the face of the country is agreeably diversified with hill, dale, mountain, heath, streams, lakes, woods, and fields of corn: the shire is likewise beautified with a great number of agreeable seats and plantations, belonging to gentlemen of fortune. Part of this county is washed by the river Clyde in its course to the sea: even at the castle of Dumbarton, the breadth of it amounts to two miles at high-water, and it continues extending in width and depth until it joins the ocean. From the mouth of the Clyde, the two bays of Lochlong and Lochfyn make large indentations in the shire of Dumbarton. The only river of any consideration that runs through this county, is the Leven, the Lelanionius of Ptolemy, otherwise called *Levinia*, the Latin name for Lenox. The river Leven is a pure transparent pastoral stream, that warbles over a bed of pebbles, thro' a delightful vale adorned with farms, seats, woods, and plantations. It derives its origin from the great lake called *Lochlomond*, of which indeed it is the overflowing, and, after a delightful meandering course of five or six miles, disembogues itself into the Clyde at the castle of Dumbarton. But the greatest curiosity of this county is Lochlomond itself, a vast body of fresh water, supplied by subterra-

neous springs and rivulets, surrounded with huge mountains, extending 25 miles in length, and in some places five miles in breadth, incredibly deep in every part, interspersed with 24 verdant isles, some of which are stocked with red deer, and inhabited. Nothing can be more wildly romantic than this part of the country, during the summer-season, on the south side of the lake: the high road runs in some places through natural woods; overlung, on one hand, by steep mountains, covered with flowery heath; and on the other opening in long vistas upon the lake, terminated by green islands that seem to float upon the water. Among the rivers of this shire we shall likewise mention the water of Blane, which, though itself an inconsiderable stream, hath been rendered famous by the birth of George Buchanan, the celebrated Latin poet and historian. He was born on the north side of the lake, not far from the place called *Buchannan*, where we may behold an elegant seat belonging to the duke of Montrose, head of the noble family of Graham, so often distinguished by its loyalty, integrity, and valour. The same part of the country gave birth to the great mathematician and naturalist, Napier lord Merchiston, inventor of the logarithms. The title of *Lenox*, with the property of great part of the shire, was heretofore vested in a branch of the royal family of Stuart, with which it was reunited in the person of king James VI. whose father, Henry lord Darnly, was son to the duke of Lenox. This prince conferred the title upon his kinsman Esme Stuart, son of John lord D'Aubigny in France: but, his race failing at the death of Charles duke of Lenox and Richmond, and the estate devolving to the crown, king Charles II. conferred both titles on his own natural son by the duchess of Portsmouth; and they are still enjoyed by his posterity. The people of Lenoxshire are chiefly Lowlanders, though in some parts of it divine service is performed in the Erse language. The most numerous clans in this district, are the Macfarlanes, the Colquhouns, and the Buchannans. They generally profess the Protestant faith, according to the Presbyterian discipline; yet some of the gentlemen follow the English ritual. The commonalty are for the most part sober, honest, and industrious; and though they live poorly, are tall, vigorous, and healthy.

**LENS**, a piece of glass, or any other transparent substance, the surfaces of which are so formed, that the rays of light, by passing through it, are made to change their direction, either tending to meet in a point beyond the lens, or made to become parallel after converging or diverging; or lastly proceeding as if they had issued from a point before they fell upon the lens. Some lenses are convex, or thicker in the middle; some concave, or thinner in the middle; some plano-convex, or plano-concave; that is with one side flat, and the other convex or concave; and some are called meniscuses, or convex on one side and concave on the other. See **DIOPTRICS**, p. 2475.

**LENT**, a solemn time of fasting in the Christian church, observed as a time of humiliation before Easter, the great festival of our Saviour's resurrection.

Those of the Romish church, and some of the Protestant communion, maintain, that it was always a fast of forty days, and, as such, of apostolical institution. Others think it was only of ecclesiastical in-

stitution, and that it was variously observed in different churches, and grew by degrees from a fast of forty hours, to a fast of forty days. This is the sentiment of Morton, bishop Taylor, du Moulin, Dailé, and others.

Anciently the manner of observing lent among those who were piously disposed, was to abstain from food till evening: their only refreshment was a supper; and then it was indifferent whether it was flesh or any other food, provided it was used with sobriety and moderation.

Lent was thought the proper time for exercising, more abundantly, every species of charity. Thus what they spared from their own bodies by abridging them of a meal, was usually given to the poor; they employed their vacant hours in visiting the sick and those that were in prison, in entertaining strangers, and reconciling differences. The imperial laws forbade all prosecution of men in criminal actions, that might bring them to corporal punishment and torture, during the whole season. This was a time of more than ordinary strictness and devotion, and therefore in many of the great churches they had religious assemblies for prayer and preaching every day. All public games and stage-plays were prohibited at this season; as also the celebration of all festivals, birth-days, and marriages, as unsuitable to the present occasion.

The Christians of the Greek church observe four lents: the first commences on the 15th of November; the second is the same with our lent; the third begins the week after Whitsuntide, and continues till the festival of St Peter and St Paul; and the fourth commences on the first of August, and lasts no longer than till the 15th. These lents are observed with great strictness and austerity; but on Saturdays and Sundays they indulge themselves in drinking wine and using oil, which are prohibited on other days.

**LENTISCUS**, in botany. See **PISTACIA**.

**LEO**, in zoology. See **FELIS**.

**LEO**, in astronomy. See there, n° 206.

**LEO X.** whose proper name was John de Medicis, is a pope ever to be remembered by Protestants, as having proved the cause of the reformation begun by Martin Luther. He had been honoured with a cardinal's hat at 14 years of age, and some years after with the dignity of legate by Julius II. He was in that quality in the army which was defeated by the French near Ravenna in 1512, where he was taken prisoner. The soldiers, who had overcome him, shewed him such great veneration, that they humbly asked his pardon for gaining the victory, besought him to give them absolution for it, and promised never to bear arms against the pope. When pope Julius died, Leo was very ill of the venereal disease at Florence, and was carried to Rome in a litter. His hurrying about every night to the cardinals of his faction, occasioned the breaking of his ulcer; and the matter which ran from it exhaled such a stench, that all the cells in the conclave, which were separated only by thin partitions, were poisoned by it. Upon this the cardinals consulted the physicians of the conclave, to know what the matter was. They, being bribed, said the cardinal de Medicis could not live a month; which sentence occasioned his being chosen pope. Thus cardinal de Medicis, then not 30 years of age, was elected pope

upon a false information; and as joy is the most sovereign of all remedies, he soon after recovered his health, so that the old cardinals had reason to repent their credulity.—He was better calculated for a temporal prince, being ambitious, politic, luxurious, a connoisseur in the fine arts, and an accomplished fine gentleman: thus qualified, it is no wonder that so young a pontiff, neglecting the true interest of his church, should avail himself of the folly of religious dupes, and publicly sell indulgences to support his prodigality, especially as he was known to disbelieve Christianity itself, which he called *A very profitable fable for him and his predecessors*. In 1517, he published general indulgences throughout Europe (and ordered the priests to recommend them) in favour of those who would contribute any sum towards completing the church of St Peter; and this was the basis of the reformation. (See LUTHER and INDULGENCE.) Leo died in 1521.

It is but justice to add, that to this pope was principally owing the revival of polite literature in Italy. He spared neither pains nor expence in recovering ancient manuscripts, and procuring good editions of them; he favoured the arts and sciences; and gloried in being the patron of learned and ingenious men, who in return have been very lavish in his praise. Mr Pope, in his essay on Criticism, bestows on him these harmonious lines.

But feel each Muse, in Leo's golden days,  
Starts from her trance, and trims her wither'd bays;  
Rome's ancient Genius, o'er its ruins spread,  
Shakes off the dust, and rears his rev'rend head.  
Then Sculpture and her sister Arts revive;  
Stones leap to form, and rocks begin to live;  
With sweeter notes each rising temple rung;  
A Raphael painted, and a Vase sung.

LEO (St.), a small but strong town of Italy, in the territory of the church, and duchy of Urbino, with a bishop's see. It is seated on a mountain, near the river Marrechia, in E. Long. 12. 25. N. Lat. 43. 57.

LEOMINSTER, a town of Herefordshire, in England, seated on the river Lug; which waters the north and east sides of the town. It contains one parish, about 400 houses, six wards, and the principal officer is a bailiff. It is of great note for its fine wool, has several good inns, and sends two members to parliament. W. Long. 2. 45. N. Lat. 52. 20.

LEON, an ancient town of France, in Lower Bretagne, and capital of the Lyonnais, with a bishop's see. It is seated near the sea, in W. Long. 3. 55. N. Lat. 48. 41.

LEON, a province of Spain, with the title of a kingdom; bounded on the north by Asturias; on the west by Galicia and Portugal; and on the south by Estremadura and Castile, which also bounds it on the east. It is about 125 miles in length, and 100 in breadth; and is divided into almost two equal parts by the river Duero, or Douro. It produces all the necessaries of life, and Leon is the capital town.

LEON, an ancient and large episcopal town of Spain, and capital of the kingdom of that name, built by the Romans in the time of Galba. It has the finest cathedral church in all Spain. It was formerly more rich and populous than at present, and had the honour of being the capital of the first Christian kingdom in Spain. It is seated between two sources of the river

Ebra, in W. Long. 5. 13. N. Lat. 42. 55.

LEON (Peter Cicca de), author of the history of Peru. He left Spain his native country at 13 years of age, in order to go into America, where he resided 17 years; and observed so many remarkable things, that he resolved to commit them to writing. The first part of his history was printed at Sevil in 1553. He began it in 1541, and ended it in 1550. He was at Lima, the capital of the kingdom of Peru, when he gave the finishing stroke to it, and was then 32 years of age.

LEON de Nicaragua, a town of North America, in New Spain, and in the province of Nicaragua; the residence of the governor, and a bishop's see. It consists of about 1000 houses, and has several monasteries and nunneries belonging to it. At one end of the town is a lake which ebbs and flows like the sea. The town is seated at the foot of a volcano, which renders it subject to earthquakes. It was taken by the bucaners in 1685, in fight of a Spanish army who were six to one. W. Long. 86. 10. N. Lat. 12. 25.

LEONARD DE NOBLET (St.), an ancient town of France, in the province of Guienne and territory of Limosin, with a considerable manufactory of cloth and paper. It is seated on the river Vienne, in E. Long. 1. 35. N. Lat. 45. 50.

LEONARDO DA VINCI. See VINCI.

LEONCLAVIUS (John), one of the most learned men of the 16th century, was a native of Westphalia. He travelled into Turkey, and collected excellent materials for composing *The Ottoman history*; and it is to him the public is indebted for the best account we have of that empire. To his knowledge in the learned languages, he had added that of the civil law; whereby he was very well qualified to translate the *Basilica*. His other versions were esteemed, tho' critics pretend to have found many faults in them. He died in 1593, aged 60.

LEONIDAS I. king of Sparta, a renowned warrior, slain in defending the straits of Thermopylae against Xerxes, 480 B. C. See SPARTA.

LEONINE, in poetry, is applied to a kind of verses which rhyme at every hemistich, the middle always chiming to the end. Of which kind we find several ancient hymns, epigrams, prophecies, &c.—For instance, Muretus speaking of the poetry of Lorenzo Gambara of Bresse, says,

*Brixia, vestra stratis merdosa volumina vatis,  
Non sunt nostratis tergere digna nates.*

The following one is from the school of Salernum:  
*Ut vites penam de potibus incipe cœnam.*

The origin of the word is somewhat obscure: Pasquier derives it from one Leoninus, or Leonius, who excelled in this way, and dedicated several pieces to pope Alexander III.; others derive it from pope Leo; and others from the beast called *lion*, by reason it is the loftiest of all verses.

LEONTICE, LION'S LEAF; a genus of the monogynia order, to the hexandria class of plants. There are four species, natives of the southern parts of Europe, two of which are sometimes cultivated in this country. These are, 1. The chrysozomum with winged leaves; and, 2. The leontopetalum with decomposed leaves. Both those plants are natives of the Archipelago



Leontini  
|  
Leonturus.

pelago islands, and also grow in the corn-fields about Aleppo in Syria, where they flower soon after Christmas. They have large tuberous roots like those of the cyclamen, covered with a dark-brown bark. The flowers sit upon naked footstalks: those of the first sort sustain many yellow flowers, but the flowers of the second are of a paler colour. Both species are propagated by seeds, which must be sown soon after they are ripe, otherwise they seldom succeed. When sent to distant countries, they must be preserved in sand. The plants are, however, very difficult to be preserved in this country: for they will not thrive in pots; and when they are planted in the full ground, the frost frequently destroys them. The best way is to sow the seed as soon as it comes from abroad, covering it with glasses in the winter to protect it from frost; and, in the spring, when the plants begin to appear, they must have free air admitted to them at all times when the weather is mild, otherwise they will be weak.

LEONTINI, or LEONTIUM, (anc. geog.) a town of Sicily on the south side of the river Terias, 20 miles north-west of Syracuse. The territory, called *Campi Leontini*, was extremely fertile, (Cicero): these were the *Campi Læstrigoni*, anciently so called; the feat of the Læstrigons, according to the commentators on the poets. The name *Leontini* is from *Leo*, the impression on their coin being a lion. Now called *Lentini*, a town situate in the Val di Noto, in the south-east of Sicily.

LEONTIUM, one of the twelve towns of Achaia, whether on, or more distant from, the bay of Corinth, is uncertain. *Leontium* of Sicily. See LEONTINI.

LEONTODON, DANDELION; a genus of the polygamia æqualis order, belonging to the syngenesia class of plants. There are nine species, of which the only remarkable one is the Taraxacum, or common dandelion, found on the road-sides, in pastures, and on the banks of ditches. Early in the spring, the leaves whilst yet white and hardly unfolded are an excellent ingredient in salads. The French eat the roots and tender leaves with bread and butter. Children that eat it in the evening experience its diuretic effects in the night, which is the reason that other European nations as well as ourselves vulgarly call it *pissi-a-bed*. When a swarm of locusts had destroyed the harvest in the island of Minorca, many of the inhabitants subsisted upon this plant. The expressed juice has been given to the quantity of four ounces three or four times a-day; and Boerhaave had a great opinion of the utility of this and other lactescent plants in visceral obstructions. Goats eat it; swine devour it greedily; sheep and cows are not fond of it, and horses refuse it. Small birds are fond of the seeds.

LEONURUS, LION'S-TAIL; a genus of the gymnospermia order, belonging to the didynamia class of plants.

*Species.* 1. The Africana, with spear-shaped leaves, is a native of Ethiopia. It rises with a shrubby stalk seven or eight feet high, sending out several four-cornered branches, garnished with oblong narrow leaves, acutely indented on their edges, hairy on their upper side, and veined on the under side, standing opposite. The flowers are produced in whorls, each of the branches having two or three of these whorls towards their ends. They are of the lip kind, shaped somewhat like those of the dead nettle; but are much longer,

and covered with short hairs. They are of a golden scarlet colour, so make a fine appearance. The flowers commonly appear in October and November, and sometimes continue till the middle of December, but are not succeeded by seeds in this country. There is a variety with variegated leaves which is admired by some, but the whorls of flowers are smaller than those of the plain sort. 2. The nepetæfolia, with oval leaves, is a native of the Cape of Good Hope. This rises with a square shrubby stalk about three feet high, sending out several four-cornered branches, garnished with oval crenated leaves, rough on their under side like the dead-nettle, but veined on the upper side, and placed opposite. The flowers come out in whorls like those of the former sort, but are not so long nor so deep-coloured. They appear at the same season with the first, and continue as long in beauty. There are three other species, but the above are the most remarkable.

*Culture.* Both sorts are propagated by cuttings, which should be exposed to the air long enough to harden the shoots, and planted in the beginning of July, after which they will take root very freely. They should be planted in a loamy border to an eastern aspect; and if they are covered closely with a bell or hand-glass to exclude the air, and shaded from the sun, it will forward their putting forth roots. As soon as they have taken good root, they should be taken up and planted each in a separate pot filled with soft loamy earth, and placed in the shade till they have taken new root. In October they must be removed into the green-house.

LEOPARD. See FELIS.

LEOPARD'S BANE, in botany. See DORONICUM.

LEPANTO, a strong and very considerable town of Turkey in Europe, and in Livadia, with an archbishop's see and a strong fort. It is built on the top of a mountain, in form of a sugar-loaf; and is divided into four towns, each surrounded by walls, and commanded by a castle on the top of the mountain. The harbour is very small, and may be shut up by a chain, the entrance being but 50 feet wide. It was taken from the Turks by the Venetians in 1687; but was afterwards evacuated, and the castle demolished in 1699, in consequence of the treaty of Carlowitz. It was near this town that Don John of Austria obtained the famous victory over the Turkish fleet in 1571. The produce of the adjacent country is wine, oil, corn, and rice. Turkey leather is also manufactured here. The wine would be exceedingly good if they did not pitch their vessels on the inside, but this renders the taste very disagreeable to those who are not accustomed to it. The Turks have six or seven mosques here, and the Greeks two churches. It is seated on a gulph of the same name, in E. Long. 22. 13. N. Lat. 38. 34.

LEPIDIUM, DITTANDER, or Peppervort, a genus of the siliculosa order, belonging to the tetradynamia class of plants. There are 19 species, of which the only remarkable one is the latifolium or common dittander. This is a native of many parts both of Scotland and England. It hath small, white, creeping roots, by which it multiplies very fast, and is difficult to be eradicated after it has long grown in any place. The stalks are smooth, rise two feet high, and send

Leopard  
|  
Lepidium.

Lepidoptera  
||  
Lepus.

out many hide-branches. The flowers grow in close bunches towards the top of the branches, coming out from the side; they are small, and composed of four small white petals. The seeds ripen in autumn. The whole plant has a hot biting taste like pepper; and the leaves have been often used by the country-people to give a relish to their viands instead of that spice, whence the plant has got the appellation of *poor man's pepper*. It is reckoned an antiscorbutic, and was formerly used instead of the *borje radish* *scurey-grass*.

LEPIDOPTERA, in zoology, an order of insects, with four wings, which are covered with imbricated squamulæ. See ZOOLOGY.

LEPIUM, in natural history, a genus of fossils of the harder gypsum, composed of very small particles, and of a less glittering hue.

There is only one species of this genus, being one of the least valuable and moist impure of the class of gypsums. It is of an extremely rude, irregular, coarse, and unequal structure; a little soft to the touch, of a very dull appearance, and of different degrees of a greyish white. It is burnt in plaster for the coarser works; it calcines very slowly and unequally, and makes but a very coarse and ordinary plaster.

LEPROSY, a foul cutaneous disease, appearing in dry, white, thin, scurfy scabs, either on the whole body, or only some part of it, and usually attended with a violent itching and other pains. See (*the Index* subjoined to) MEDICINE.

LEPTODECORHOMBES, in natural history, a genus of fossils of the order of the scelenite; consisting of 10 planes, each so nearly equal to that opposite to it as very much to approach to a decahedral parallelepiped, though never truly or regularly so.

Of this genus there are only five known species. 1. A thin, fine, pellucid, and slender-streaked one, with transverse striae, found in considerable quantities in the strata of clay in most parts of England, particularly near Heddington in Oxfordshire. 2. A thin, dull-looking, opaque, and slender-streaked one, more scarce than the former, and found principally in Leicester-shire and Staffordshire. 3. A thin fine-streaked one, with longitudinal striae, found in the clay-pits at Richmond, and generally lying at great depths. This has often on its top and bottom a very elegant smaller rhomboide, described by four regular lines. 4. A rough kind, with thick transverse striae, and a scabrous surface, very common in Leicestershire and York-shire. And, 5. A very short kind, with thick plates, common in the clay-pits of Northamptonshire and York-shire.

LEPTOPOLYINGLIMI, in natural history, a genus of fossil shells, distinguished by a number of minute teeth at the cardo; whereof we find great numbers at Harwich-cliff, and in the marle-pits of Suffex.

LEPTURA, in zoology, a genus of insects belonging to the order of coleoptera, the characters of which are these:—The feelers are bristly; the elytra are attenuated towards the apex; and the thorax is somewhat cylindrical. There are 25 species, principally distinguished by their colour.

LEPUS, in zoology, a genus of quadrupeds belonging to the order of glires. The characters are these:—They have two fore-teeth in each jaw; those

in the upper-jaw are double, the interior ones being smallest. There are four species, viz.

1. The timidus, or hare, has a short tail; the points of the ears are black; the upper-lip is divided up to the nostrils; the length of the body is generally about a foot and a half; and the colour of the hair is reddish, interperfed with white. The hare is naturally a timid animal. He sleeps in his form, or feat, during the day; and feeds, copulates, &c. in the night. In a moon-light evening, a number of them are sometimes seen sporting together, leaping and pursuing each other: But the least motion, the falling of a leaf, alarms them; and then they all run off separately, each taking a different route. They are extremely swift in their motion, which is a kind of gallop, or a succession of quick leaps. When pursued, they always take to the higher grounds: as their fore-feet are much shorter than the hind-ones, they run with more ease up-hill than down-hill. The hare is endowed with all those instincts which are necessary for his own preservation. In winter he chooses a form exposed to the south, and in summer to the north. He conceals himself among vegetables of the same colour with himself. Mr Fouilloux says, that he observed a hare, as soon as he heard the sound of the horn, or the noise of the dogs, although at a mile's distance, rise from her feat, swim across a rivulet, then lie down among the rushes, and by this means evade the scent of the dogs. After being chased for a couple of hours, a hare will sometimes push another from his form, and lie down in it himself. When hard pressed, the hare will mingle with a flock of sheep, run up an old wall and conceal himself among the grass on the top of it, or cross a river several times at small distances. He never runs against the wind, or straight forward; but constantly doubles about, in order to make the dogs lose their scent.

It is remarkable, that the hare, although ever so frequently pursued by the dogs, seldom leaves the place where she was brought forth, or even the form in which she usually sits. It is common to find them in the same place next day, after being long and keenly chased the day before. The females are more gross than the males, and have less strength and agility; they are likewise more timid, and never allow the dogs to approach so near their form before rising as the males. They likewise practise more arts, and double more frequently, than the males.

The hare is diffused almost over every climate; and, notwithstanding they are every-where hunted, their species never diminishes. They are in a condition of propagating the first year of their lives; the females go with young about 30 days, and produce four or five at a time; and as soon as they have brought forth, they again admit the embraces of the male; so that they may be said to be always pregnant. The eyes of the young are open at birth; the mother suckles them about 20 days, after which they separate from her, and procure their own food. The young never go far from the place where they were brought forth; but still they live solitary, and make forms about 30 paces distant from each other: Thus, if a young hare be found any-where, you may almost be certain of finding several others within a very small distance. The hare is not so savage as his manners would indicate. He

is gentle, and susceptible of a kind of education. He is pretty easily tamed, and will even show a kind of attachment to the people of the house: But still this attachment is not so strong or lasting as to engage him to become altogether domestic; for although taken when very young, and brought up in the house, he no sooner arrives at a certain age, than he takes the first opportunity of recovering his liberty, and flying to the fields. The hare lives about seven or eight years. He feeds upon grass, and other vegetables. His flesh is excellent food.

Mr Pennant describes a species called the *Alpine hare*, which inhabits the summits of the Highland mountains, never descends into the vales, or mixes itself with the common kind, which is frequent in the bottoms: it lives among the rocks with ptarmigans, natives of the loftiest situations. It does not run fast; and, if pursued, is apt to take shelter beneath stones and in clefts of rocks: is easily tamed, and is very sprightly and full of frolic. It is fond of honey and caraway comfits, and is observed to eat its own dung before a storm. It is less than the common hare, weighing only  $6\frac{1}{2}$  lb. whereas the former weighs from 8 lb. to 12 lb. Its hair is soft and full; the predominant colour grey, mixed with a little black and tawny. In winter it entirely changes to a snowy whiteness, except the edges and tips of the ears, which retain their black colour. The alteration begins in September, and first appears about the neck and rump. In April it again resumes its grey coat. This is the case in Styria; but in the polar tracts it never varies from white, the perpetual colour of the country. In the intermediate climates between temperate and frigid, such as Scotland and Scandinavia, it regularly experiences these vicissitudes of colour.

Hares are very subject to fleas. Linnæus tells us, that the Dalecarlians make a sort of cloth, called *silt*, of the fur; which, by attracting these insects, preserves the wearer from their troublesome attacks. The hair of this creature makes a great article in the hat-manufacture; and, as our country cannot supply a sufficient quantity, a great deal is annually imported from Russia and Siberia. The hare was reckoned a great delicacy among the Romans; the Britons, on the contrary, thought it impious even to taste it: yet this animal was cultivated by them, either for the pleasure of the chase, or for the purposes of superstition; as we are informed, that Boadicea, immediately before her last conflict with the Romans, let loose a hare she had concealed in her bosom, which taking what was deemed a fortunate course, animated her soldiers by the omen of an easy victory over a timid enemy.

2. The cuniculus, or rabbit, has a very short tail, and naked ears. Its native country is Spain, where they were formerly taken with ferrets, as is practised in this country at present; which animals were first introduced into that country from Africa. They love a temperate and warm climate, and are incapable of bearing great cold; so that in Sweden they are obliged to be kept in houses. They abound in Britain; their furs make a considerable article in the hat-manufactories; and, of late, such part of the fur as is unfit for that purpose, has been found as good as feathers for stuffing beds and bolsters. Numbers of the skins are annually exported into China. The English counties

mostly noted for rabbits are Lincolnshire, Norfolk, and Cambridgeshire. Methold, in the last county, is famous for the best kind for the table: the soil there is sandy, and full of mosses and the *carex* grass. Rabbits swarm in the isles of Orkney, where their skins form a considerable article of commerce. Excepting otters, brown rats, common mice, and shrews, no other quadrupeds are found there. The rabbits of those isles are in general grey; those which inhabit the hills grow hoary in winter.—Formerly the silver-haired rabbits were in great esteem for lining of clothes, and their skins sold for three shillings a-piece; but since the introduction of more elegant furs, their price has fallen to 6d. The *Sunk Island* in the Humber was once famous for a mouse-coloured species, which has since been extirpated by reason of the injury they did to the banks by burrowing.

The fecundity of the rabbit is still greater than that of the hare. They will breed seven times in the year, and the female sometimes brings eight young ones at a time. Supposing this to happen regularly for four years, the number of rabbits from a single pair will amount to 1,274,840. By this account we might justly apprehend being overstocked with these animals: but a great number of enemies prevents their increase; not only men, but hawks and beasts of prey making dreadful havoc among them. Notwithstanding all these different enemies, however, we are told by Pliny and Strabo, that they once proved such a nuisance to the inhabitants of the Balearic islands, that they were obliged to implore the assistance of a military force from Augustus, in order to exterminate them. They devour herbage of all kinds, roots, grain, fruits, &c. They are in a condition for generating at the end of six months; and, like the hare, the female is almost constantly in season; she goes with young about 30 days, and brings forth from four to eight at a litter. A few days before littering, she digs a hole in the earth, not in a straight line, but in a zig-zag form: the bottom of this hole she enlarges every way, and then pulls off a great quantity of hair from her belly, of which she makes a kind of bed for her young. During the two first days after birth, she never leaves them, but when pressed with hunger, and then she eats quickly and returns: and in this manner she suckles and attends her young for six weeks. All this time both the hole and the young are concealed from the male; sometimes when the female goes out, she, in order to deceive the male, fills up the mouth of the hole with earth mixed with her own urine. But when the young ones begin to come to the mouth of the hole, and to eat such herbs as the mother brings to them, the father seems to know them: he takes them betwixt his paws, smooths their hair, and caresses them with great fondness.

3. The capensis has a tail about the length of his head, and red legs. It is a native of the Cape of Good Hope.

4. The brasiliensis has no tail. It is a native of South-America.

LEPUS, in astronomy. See there, n<sup>o</sup> 206.

LERI (John de), a Protestant minister of the province of Burgundy. He was studying at Geneva when it was reported there that Villegagnon desired they would send him some pastors into Brazil. He made



Leria  
||  
Lefcaille.

Lefcar  
||  
Leflic.

made that voyage with two ministers, whom the church of Geneva sent thither in 1556; and wrote an account of that voyage, which has been much commended by Thuanus and others.

LERIA, or LEIRIA, a strong town of Estremadura in Portugal, with a castle and bishop's see. It contains about 3,500 inhabitants, and was formerly the residence of the kings of Portugal. W. Long. 7. 50. N. Lat. 39. 40.

LERIDA, an ancient, strong, and large town of Spain, in Catalonia, with a bishop's see, an university, and a strong castle. This place declared for king Charles after the reduction of Barcelona in 1705; but it was retaken by the duke of Orleans in 1707, after the battle of Almanza. It is seated on a hill near the river Segra, and in a fertile soil, in E. Long. o. 35. N. Lat. 41. 31.

LERINS, the name of two islands in the Mediterranean Sea, lying on the coast of Provence in France, five miles from Antibes; that near the coast, called *St Margaret*, is guarded by invalids, state-prisoners being sent here. It was taken by the English in 1746, but marshal Belleisle retook it in 1747. The other is called *St Honorat*; and is less than the former, but has a Benedictine abbey.

LERMA, a town of Spain, in Old Castile, seated on the river Arlanza, with the title of a *duchy*. W. Lon. 3. 5. N. Lat. 42. 2.

LERNICA, formerly a large city in the island of Cyprus, as appears from its ruins; but is now no more than a large village, seated on the southern coast of that island, where there is a good road, and a small fort for its defence.

LERO, or LEROS, an island of the Archipelago, and one of the Sporades; remarkable, according to some authors, for the birth of Patroclus. E. Long. 26. 15. N. Lat. 37. o.

LE ROY LE VEUT, the king's assent to public bills. See the articles BILL, STATUTE, and PARLIAMENT.

LESBOS, LESSUS, or *Lefbia*, (anc. geogr.), an island on the coast of Troas and Myia, in the Hither Asia, inhabited by *Eolians*, (Scylax); taking its name from Lesbos, grandson of *Eolus*, according to *Diodorus Siculus*. In length from north to south 560 stadia; in compass, 1500. A noble and pleasant island, says *Tacitus*; famous for the fertility of its soil, the generosity of its wines, and the beauty of its women: the native place of *Sappho* the poetess. Anciently called *Lafia*, *Pelafgia*, *Agira*, *Ethiope*, and *Macaria*; (Pliny); *Lefbiur*, and *Lefbour*, the epithets, (Horace); *Lefbia regula* (Aristotle), a proverbial saying for bringing down the rule to our actions, instead of our actions up to the rule. The island is now called *Lefbor*, or *Metelin*. See METELIN.

LESCAILLE (James), a celebrated Dutch poet and printer, was born at Geneva. He and his daughter Catharine Lefcaille have excelled all the Dutch poets. That lady, who was furnished the *Sappho of Holland*, and the *tenth Muse*, died in 1711. A collection of her poems has been printed, in which are the *Tragedies* of *Genferic*, *Wenceslaus*, *Herod* and *Marianne*, *Hercules* and *Dejanaira*, *Nicomedes*, *Arriande*, *Callandra*, &c. James Lefcaille her father deserved the poet's crown, with which the emperor

Leopold honoured him in the year 1663: he died about the year 1677, aged 67.

LESCAR, a town of Gascony, in France, and in the territory of Bears, with a bishop's see; seated on a hill, in W. Long. o. 30. N. Lat. 43. 23.

LESKARD, a town in Cornwall, seated in a level, is a corporation, and sends to members to parliament. It had formerly a castle, now in ruins; and has a good free-school, and a considerable manufacture of yarns, which is chiefly sold at Exeter. W. Lat. 4. 45. N. Lat. 50. 34.

LESLIE (Jehn), bishop of Ross in Scotland, the son of Gavin Lesly an eminent lawyer, was born in the year 1526, and educated at the university of Aberdeen; of which diocese he was made official, when but a youth. He was soon after created doctor of civil and canon law; but being peculiarly addicted to the study of divinity, he took orders, and became parson of Ume.

When the reformation began to spread in Scotland, and disputes about religion ran high, Dr Lesly, in 1560, distinguished himself at Edinburgh as a principal advocate for the Romish church, and was afterwards deputed by the chief nobility of that religion to console with queen Mary on the death of her husband the king of France, and to invite her to return to her native dominions. Accordingly, after a short residence with her majesty, they embarked together at Calais in 1561, and landed at Leith. She immediately made him one of her privy-council, and a senator of the college of justice. In 1564, he was made abbot of Lundores; and, on the death of Sinclair, was promoted to the bishopric of Ross. These accumulated honours he wished not to enjoy in luxurious indolence. The influence derived from them he exerted to the prosperity of his country. It is to him that Scotland is indebted for the publication of its laws, commonly called "The black acts of parliament," from the Saxon character in which they were printed. At his most earnest desire, the revision and collection of them were committed to the great officers of the crown.

In 1568, queen Mary having fled to England for refuge, and being there detained a prisoner, queen Elizabeth appointed certain commissioners at York to examine into the cause of the dispute between Mary and her subjects. These commissioners were met by others from the queen of Scots. The bishop of Ross was of the number, and pleaded the cause of his royal mistress with great energy, though without success: Elizabeth had no intention to release her.

Mary, disappointed in her expectations from the conference at York, sent the bishop of Ross ambassador to Elizabeth, who paid little attention to his complaints. He then began to negotiate a marriage between his royal mistress and the duke of Norfolk; which negotiation, it is well known, proved fatal to the duke, and was the cause of Lesly's being sent to the tower. In 1573 he was banished the kingdom, and retired to Holland. The two following years he spent in fruitless endeavours to engage the powers of Europe to espouse the cause of his queen. His last application was to the pope; but the power of the heretic Elizabeth had no less weight with his holiness, than with the other Roman catholic princes of Europe.

rope. Finding all his personal applications ineffectual, he had recourse to his pen in queen Mary's vindication; but Elizabeth's *ultima ratio regum* was too potent for all his arguments.

Bishop Lefly, during his exile, was made coadjutor to the archbishop of Rouen. He was at Brussels when he received the account of queen Mary's execution; and immediately retired to the convent of Guirternberg near that city, where he died in the year 1596.

It was during the long and unfortunate captivity of Mary, that he amused himself in writing the history of Scotland, and his other works. The elegance and charms of literary occupations served to alluage the violence of his woes. His knowledge and judgement as an historian are equally to be commended. Where he acts as the transcriber of Boece, there may be distinguished, indeed, some of the inaccuracies of that writer. But, when he speaks in his own person, he has a manliness, a candour, and a moderation, which appear not always even in authors of the Protestant persuasion. His works are, 1. *Afflicti animi consolationes*, &c. composed for the consolation of the captive queen. 2. *De origine, moribus, et gestis Scottorum*. 3. *De titulo et jure serenissime Mariæ Scottorum reginæ, quo regni Angliæ successionem sibi jure vindicat*. 4. *Parænesis ad Anglos et Scottos*. 5. *De illust. seminarum in republ. administranda*, &c. 6. *Oratio ad reginam Elizabetham pro libertate impetranda*. 7. *Parænesis ad nobilitatem populumque Scotticum*. 8. An account of his proceedings during his embassy in England from 1568 to 1572; manuscript, Oxon. 9. Apology for the bishop of Ross, concerning the duke of Norfolk; manuscript, Oxon. 10. Several letters, manuscript.

LESLIE (Charles), an Irish divine, and a zealous Protestant: but being attached to the house of Stuart, he left Ireland, and went to the pretender at Bar le Duc, and resided with him till near the time of his death; constantly endeavouring to make him a protestant, but without effect. He died in 1722. His principal works are, 1. A short and easy method with the Deists. 2. A short and easy method with the Jews. 3. The snake in the grass. 4. Hereditary right to the Crown of England asserted. 5. The Socinian controversy discussed. 6. The charge of Socinianism against Dr Tillotson considered; and many others. All his theological pieces, except that against archbishop Tillotson, were collected and published by himself, in 2 vols folio.

LESSER TONE, in music. See TONE.

LESSINES, a town of the Austrian Netherlands, in Hainaut, seated on the river Dender, and famous for its linen manufacture. W. Long. 3. 53. N. Lat. 51. 41.

LESSONS, among ecclesiastical writers, portions of the holy scripture, read in Christian churches, at the time of divine service.

In the ancient church, reading the scriptures was one part of the service of the catechumens; at which all persons were allowed to be present, in order to obtain instruction.

The church of England, in the choice of lessons, proceeds as follows: for the first lesson on ordinary days, the directs, to begin at the beginning of the year with Genesis, and to continue on, till the books

of the old Testament are read over; only omitting the Chronicles, which are for the most part the same with the books of Samuel and Kings, and other particular chapters in other books, either because they contain names of persons, places, or other matters less profitable to ordinary readers.

The course of the first lessons for Sundays is regulated after a different manner. From Advent to Septuagesima-Sunday, some particular chapters of Isaiah are appointed to be read, because that book contains the clearest prophecies concerning Christ. Upon Septuagesima-Sunday Genesis is begun, because that book which treats of the fall of man, and the severe judgment of God inflicted on the world for sin, best suits with a time of repentance and mortification. After Genesis, follow chapters out of the books of the Old Testament, as they lie in order; only on festival Sundays, such as Easter, Whitunday, &c. the particular history relating to that day is appointed to be read; and on the Saints-days, the church appoints lessons out of the moral books, such as Proverbs, Ecclesiastes, Ecclesiasticus, &c. as containing excellent instructions for the conduct of life.

As to the second lessons, the church observes the same course both on Sundays and week-days: reading the gospels and Acts of the Apostles in the morning, and the epistles in the evening, in the order they stand in the New Testament: excepting on saints days and holy-days, when such lessons are appointed as either explain the mystery, relate the history, or apply the example to us.

LESTOFF, or LEOSTOFF, a town of Suffolk, in England, seated on the sea-shore, is concerned in the fisheries of the North-sea, cod, herrings, mackerels, and sprats; has a church, and a dissenting meeting-house; and for its security, fix 18-pounders, which they can move as occasion requires; but it has no battery. The town consists of 500 houses; but the streets, though tolerably paved, are narrow. The coast is there very dangerous for strangers. E. Long. 1. 45. N. Lat. 52. 37.

L'ÉTRANGE (Sir Roger), a noted writer in the 17th century, was descended from an ancient family, seated at Huntanton-hall in the county of Norfolk, where he was born in 1616, being the youngest son of Sir Hammond L'Étrange baronet, a zealous royalist. Having in 1644 obtained a commission from king Charles I. for reducing Lynn in Norfolk, then in possession of the parliament, his design was discovered, and his person seized. He was tried by a court martial at Guildhall in London, and condemned to die as a spy; but was reprieved, and continued in Newgate for some time. He afterward went beyond sea; and in August 1653 returned to England, where he applied himself to the protector Oliver Cromwell, and having once played before him on the bass-viol, he was by some nicknamed *Oliver's fiddler*. Being a man of parts, master of an easy humorous style, but withal in narrow circumstances, he set up a newspaper, under the title of *The public intelligencer*, in 1663; but which he laid down, upon the publication of the first London gazette in 1665, having being allowed, however, a consideration by government. Some time after the Popish plot, when the Tories began to gain the ascendant over the Whigs, he, in a paper called

the *Observer*, became a zealous champion for the former. He was afterward knighted, and served in the parliament called by king James II. in 1685. But things taking a different turn in that prince's reign, in point of liberty of conscience, from what most people expected, our author's *Observers* were disused as not at all suiting the times. However, he continued publisher of the press till king William's accession, in whose reign he met with some trouble as a disaffected person. However, he went to his grave in peace, after he had in a manner survived his intellectuals. He published a great many political tracts, and translated several works from the Greek, Latin, and Spanish: viz. Josephus's works, Cicero's Offices, Seneca's Morals, Erasmus's Colloquies, Æsop's Fables, and Bonas's Guide to Eternity. The character of his style has been variously represented; his language being observed by some to be easy and humorous, while Mr Gordon says, "that his productions are not fit to be read by any who have taste or good-breeding. They are full of phrases picked up in the streets, and nothing can be more low or nauseous."

LESTWEITHEL, a town of Cornwall, in England, seated on the river Foy, not far from its fall into Foy-haven. Formerly ships came as far up as the town; but the channel is now stopped up. It is a corporation, and sends two members to parliament. They also keep courts here belonging to the flannery; and the county-gaol is likewise here. It is conveyed by a mayor, 6 capital burgesses, and 17 common-council men. The town consists of about 100 houses; but the streets, though paved, are bad. W. Long. 5. 0. N. Lat. 50. 30.

LETHARGY. See (*Index* subjoined to) MEDICINE.

LETHARGY, in farristry. See there, § 9.

LETHE, in the ancient mythology, one of the rivers of hell, signifying oblivion or forgetfulness; its waters having, according to poetic fiction, the peculiar quality of making those who drank them forget every thing that was past.

LETTI (Gregorio), an eminent Italian writer, was descended of a family which once made a considerable figure at Bologna: Jrom, his father, was page to prince Charles de Medicis; served some time in the troops of the grand duke as captain of foot; and settling at Milan, married there in 1628. He was afterward governor of Almontea in Calabria, and died at Salerno in 1639. Our author was born at Milan in 1630, studied under the Jesuits at Colenza, and was afterward sent by an uncle to Rome, who would have him enter into the church; but he being averse to it, went to Geneva, where he studied the government and the religion there. Thence he went to Lausanne; and contracting an acquaintance with John Anthony Guerin, an eminent physician, lodged at his house, made profession of the Calvinist religion, and married his daughter. He settled at Geneva; where he spent almost twenty years, carrying on a correspondence with learned men, especially those of Italy. Some contents obliged him to leave that city in 1679; upon which he went to France, and then into England, where he was received with great civility by Charles II. who, after his first audience, made him a present of a thousand crowns, with a promise of the

place of historiographer. He wrote there the history of England; but that work not pleasing the court on account of his too great liberty in writing, he was ordered to leave the kingdom. He went to Amsterdam in 1682, and was honoured with the place of historiographer to that city. He died suddenly in 1701. He was a man of indefatigable application, as the multiplicity of his works show. The principal of these are, 1. The nepotism of Rome. 2. The universal monarchy of Lewis XIV. 3. The life of pope Sixtus V. 4. The life of Philip II. king of Spain. 5. The life of the emperor Charles V. 5. The life of Elizabeth, queen of England. 7. The history of Oliver Cromwell. 8. The history of Great Britain, 5 vols. 12mo. 9. The history of Geneva, &c.

LETRIM, a county of Ireland, in the province of Connaught, 44 miles in length, and 17 in breadth; bounded on the east and north-east by Cavan and Fermanagh, by Sligo and Roscommon on the west and south-west, and by Longford on the east and south-east. It is a hilly country, with rank grass, which feeds a great number of cattle. The chief town is Letrim, seated not far from the river Shannon. It contains 4000 houses, 21 parishes, 5 baronies, 2 boroughs, and sends 6 members to parliament.

LETTER, a character used to express one of the simple sounds of the voice; and as the different simple sounds are expressed by different letters, these, by being differently compounded, become the visible signs or characters of all the modulations and mixtures of sounds used to express our ideas in a regular language. Thus, as by the help of speech we render our ideas audible; by the assistance of letters we render them visible, and by their help we can wrap up our thoughts, and send them to the most distant parts of the earth, and read the transactions of different ages. As to the first letters, what they were, who first invented them, and among what people they were first in use, there is still room to doubt: Philo attributes this great and noble invention to Abraham; Josephus, St Irenæus, and others, to Enoch; Bibliander, to Adam; Eusebius, Clemens Alexandrinus, Cornelius Agrippa, and others, to Moses; Pomponius Mela, Herodian, Rufus Festus, Pliny, Lucan, &c. to the Phœnicians; St Cyprian, to Saturn; Tacitus, to the Egyptians; some, to the Ethiopians; and others, to the Chinese: but, with respect to these last, they can never be entitled to this honour, since all their characters are the signs of words, formed without the use of letters; which renders it impossible to read and write their language, without a vast expence of time and trouble; and absolutely impossible to print it by the help of types, or any other manner but by engraving, or cutting in wood. See PRINTING.

There have also been various conjectures about the different kinds of letters used in different languages: thus, according to Crinitus, Moses invented the Hebrew letters; Abraham, the Syriac and Chaldee; the Phœnicians, those of Attica, brought into Greece by Cadmus, and from thence into Italy by the Pelasgians; Nicolltrata, the Roman; Isis, the Egyptian; and Vulilus, those of the Goths.

It is probable, that the Egyptian hieroglyphics were the first manner of writing: but whether Cadmus and the Phœnicians learned the use of letters from the



Egyptians, or from their neighbours of Judea or Samaria, is a question; for since some of the books of the Old Testament were then written, they are more likely to have given them the hint, than the hieroglyphics of Egypt. But wheresoever the Phœnicians learned this art, it is generally agreed, that Cadmus, the son of Agenor, first brought letters into Greece; whence, in following ages, they spread over the rest of Europe.

Letters make the first part or elements of grammar; an assemblage of these compose syllables and words, and these compose sentences. The alphabet of every language consists of a number of letters, which ought each to have a different sound, figure, and use. As the difference of articulate sounds was intended to express the different ideas of the mind, so one letter was originally intended to signify only one sound, and not, as at present, to express sometimes one sound and sometimes another; which practice has brought a great deal of confusion into the languages, and rendered the learning of the modern tongues much more difficult than it would otherwise have been. This consideration, together with the deficiency of all the known alphabets, from their wanting some letters to express certain sounds, has occasioned several attempts towards an universal alphabet, to contain an enumeration of all such single sounds or letters as are used in any language. See ALPHABET.

Grammarians distinguish letters into vowels, consonants, mutes, liquids, diphthongs, and characteristics. They are likewise divided into capital and small letters. They are also denominated from the shape and turn of the letters; and in writing are distinguished into different hands, as round-text, German-text, round-hand, Italian, &c. and in printing, into roman, italic, and black letter.

The term *LETTER*, or *type*, among printers, not only includes the *CAPITALS*, *SMALL CAPITALS*, and small letters, but all the points, figures, and other marks cast and used in printing; and also the large ornamental letters, cut in wood or metal, which take place of the illuminated letters used in manuscripts. The letters used in printing are cast at the ends of small pieces of metal, about three quarters of an inch in length; and the letter being not indented, but raised, easily gives the impression, when, after being blacked with a glutinous ink, paper is closely pressed upon it. See the articles *PRINTING* and *TYPE*. A fount of letters includes small letters, capitals, small capitals, points, figures, spaces, &c. but besides they have different kinds of two-lined letters, only used for titles, and the beginning of books, chapters, &c. See *FOUNT*.

*LETTER*, is also a writing addressed and sent to a person. See *EPISTLE*.

The art of epistolary writing, as the late translator of Pliny's Letters has observed, was esteemed by the Romans in the number of liberal and polite accomplishments; and we find Cicero mentioning with great pleasure, in some of his letters to Atticus, the elegant specimen he had received from his son, of his genius in this way. It seems indeed to have formed part of their education; and, in the opinion of Mr Locke, it well deserves to have a share in ours. "The writing of letters (as that judicious author observes)

"enters so much into all the occasions of life, that no gentleman can avoid shewing himself in compositions of this kind. Occurrences will daily force him to make this use of his pen, which lays open his breeding, his sense, and his abilities, to a fever examination than any oral discourse." It is to be wondered we have so few writers in our own language, who deserve to be pointed out as models upon such an occasion. After having named Sir William Temple, it would perhaps be difficult to add a second. The elegant writer of Cowley's life mentions him as excelling in this uncommon talent; but as that author declares himself of opinion, "That letters which pass between familiar friends, if they are written as they should be, can scarce ever be fit to see the light," the world is deprived of what, no doubt, would have been well worth its inspection. A late distinguished genius treats the very attempt as ridiculous, and professes himself "a mortal enemy to what they call a *fine letter*." His aversion however was not so strong, but he knew to conquer it when he thought proper; and the letter which closes his correspondence with bishop Atterbury is, perhaps, the most genteel and manly address that ever was penned to a friend in disgrace. The truth is, a fine letter does not consist in saying fine things, but in expressing ordinary ones in an uncommon manner. It is the *proprie communia dicere*, the art of giving grace and elegance to familiar occurrences, that constitutes the merit of this kind of writing. Mr Gay's letter, concerning the two lovers who were struck dead with the same flash of lightning, is a master-piece of the sort; and the specimen he has there given of his talents for this species of composition makes it much to be regretted we have not more from the same hand.

*Of the Style of Epistolary Composition.* Purity in the choice of words, and justness of construction, joined with perspicuity, are the chief properties of this style. Accordingly Cicero says: "In writing letters, we make use of common words and expressions." And Seneca more fully: "I would have my letters to be like my discourses, when we either sit or walk together, unstudied and easy." And what prudent man, in his common discourse, aims at bright and strong figures, beautiful turns of language, or laboured periods? Nor is it always requisite to attend to exact order and method. He that is master of what he writes, will naturally enough express his thoughts without perplexity and confusion; and more than this is seldom necessary, especially in familiar letters.

Indeed, as the subjects of epistles are exceedingly various, they will necessarily require some variety in the manner of expression. If the subject be something weighty and momentous, the language should be strong and solemn; in things of a lower nature, more free and easy; and upon lighter matters, jocose and pleasant. In exhortations, it ought to be lively and vigorous; in consolations, kind and compassionate; and in advising, grave and serious. In narratives, it should be clear and distinct; in requests, modest; in commendations, friendly; in prosperity cheerful, and mournful in adversity. In a word, the style ought to be accommodated to the particular nature of the thing

Warf's  
Oratory.

Letter. about which it is conversant.

Besides, the different character of the person, to whom the letter is written, requires a like difference in the modes of expression. We do not use the same language to private persons, and those in a public station; to superiors, inferiors, and equals. Nor do we express ourselves alike to old men and young, to the grave and facetious, to courtiers and philosophers, to our friends and strangers. Superiors are to be addressed to with respect, inferiors with courtesy, and equals with civility; and every one's character, station, and circumstances in life, with the relation we stand in to him, occasions some variety in this respect. But when friends and acquaintances correspond by letters, it carries them into all the freedom and good-humour of conversation; and the nearer it resembles that the better, since it is designed to supply the room of it. For when friends cannot enjoy each others company, the next satisfaction is to converse with each other by letters. Indeed, sometimes greater freedom is used in epistles, than the same persons would have taken in discoursing together; because, as Cicero says, "A letter does not blush." But still nothing ought to be said in a letter, which, considered in itself, would not have been fit to say in discourse; though modestly perhaps, or some other particular reason, might have prevented it. And thus it frequently happens in requests, reproofs, and other circumstances of life. A man can ask that by writing, which he could not do by words, if present; or blame what he thinks amiss in his friend with greater liberty when absent, than if they were together. From hence it is easy to judge of the fitness of any expression to stand in an epistle, only by considering, whether the same way of speaking would be proper in talking with the same person. Indeed, this difference may be allowed, that as persons have more time to think, when they write, than when they speak; a greater accuracy of language may sometimes be expected in one, than the other. However, this makes no odds as to the kind of style; for every one would choose to speak as correctly as he writes, if he could. And therefore all such words and expressions, as are unbecoming in conversation, should be avoided in letters; and a manly simplicity free of all affectation, plain, but decent and agreeable, should run through the whole. This is the usual style of Cicero's epistles, in which the plainness and simplicity of his diction, is accompanied with something so pleasant and engaging, that he keeps up the attention of his reader, without suffering him to tire. On the other hand, Pliny's style is succinct and witty; but generally so full of turns and quibbles upon the sound of words, as apparently render it more stiff and affected than agrees with conversation, or than a man of sense would choose in discourse, were it in his power. You may in some measure judge of Pliny's manner, by one short letter to his friend, which runs thus: "How fare you? As I do in the country? pleasantly? that is, at leisure? For which reason I do not care to write long letters, but to read them; the one as the effect of niceness, and the other of idleness. For nothing is more idle than your nice folks, or curious than your idle ones. Farewell." Every sentence here consists of an antithesis, and a jingle of words, very

different from the style of conversation, and plainly the effect of study. But this was owing to the age in which he lived, at which time the Roman eloquence was sunk into puns, and an affectation of wit; for he was otherwise a man of fine sense, and great learning.

LETTER of Attorney, in law, is a writing by which one person authorises another to do some lawful act in his stead; as to give seisin of lands, to receive debts, sue a third person, &c.

The nature of this instrument is to transfer to the person to whom it is given, the whole power of the maker, to enable him to accomplish the act intended to be performed. It is either general or special: and sometimes it is made revocable, which is when a bare authority is only given; and sometimes it is irrevocable, as where debts, &c. are assigned from one person to another. It is generally held, that the power granted to the attorney must be strictly pursued; and that where it is made to three persons, two cannot execute it. In most cases, the power given by a letter of attorney determines upon the death of the person who gave it. No letter of attorney made by any seaman, &c. in any ship of war, or having letters of marque, or by their executors, &c. in order to empower any person to receive any share of prizes or bounty-money, shall be valid, unless the same be made revocable, and for the use of such seamen, and be signed and executed before, and attested by, the captain: and one other of the signing officers of the ship, or the mayor or chief magistrate of some corporation.

LETTER of Mart, or Marque. See MARQUE.

LETTERS Patent, or Overt, are writings sealed with the great seal of England, whereby a man is authorised to do, or enjoy any thing, which, of himself, he could not do. See PATENT.—They are so called, by reason of their form; as being open, with the seal affixed, ready to be shewn for the confirmation of the authority given by them.

LETTUCE, in botany. See LACTUCA.

LEVANT, in geography, signifies any country situated to the east of us, or in the eastern side of any continent or country, or that on which the sun rises.

LEVANT, is also a name given to the eastern part of the Mediterranean sea, bounded by Naxos or the lesser Asia on the north, by Syria and Palestine on the east, by Egypt and Barca on the south, and by the island of Candia and the other part of the Mediterranean on the west.

LEVATOR, in anatomy, a name given to several muscles. See ANATOMY, Table of the Muscles.

LEUCA, in antiquity, a geographical measure of length in use among the later Gauls; which according to Jornandes, who calls it *Leuga*, contained fifteen hundred paces, or one mile and a half. Hence the name of *league*, now reckoned at three miles. In the lower age called *leuva*.

LEUCADIA, formerly called *Neritis*, and a peninsula of Acarnania, (Homer) but afterwards, by cutting through the peninsula, made an island, as it is at this day; called *St. Maura*.

LEUCAS, (anc. geog.), formerly called *Neritos* and *Neritum*, a town of Leucadia or Leucas; situated near a narrow neck of land, or isthmus, on a hill facing the east and Acarnania: the foot or lower part of the town was a plain lying on the sea by which

Leu.

Letter  
||  
Leucas.

Leucadia was divided from Acarnania, (Livy); though Thucydides places *Leucas* more inward in the Island, which was joined to the continent by a bridge. It was an illustrious city, the capital of Acarnania, and the place of general assembly.

LEUCATA or LEUCATE, (anc. geog.); a promontory of Leucadia according to Strabo, a white rock projecting into the sea towards Cephalenia, on which stood a temple of Apollo furnished *Leucadias*. This place was famous for being the last resource of despairing lovers; from which they took a leap into the sea, as Sappho is said to have done.

LEUCIPPUS, a celebrated Greek philosopher and mathematician; first author of the famous system of atoms and vacuums, and of the hypothesis of storms; since attributed to the moderns. He flourished about 428 B. C.

LEUCOGÆUS, (anc. geog.), a hill situated between Puteoli and Neapolis in Campania, abounding in sulphur; now *P. Alunera*. Whence there were also springs called *Leucogæi fontes*, the waters of which, according to Pliny, gave a firmness to the teeth, clearness to the eyes, and proved a cure in wounds.

LEUCOJUM, GREAT SNOW-DROP; a genus of the monogynia order, belonging to the hexandria class of plants.

*Species.* 1. The vernum, vernal, or spring leucojum, hath an oblong bulbous root, sending up several flat leaves six or eight inches long; and amidst them an upright, channelled, hollow, naked stalk, about a foot high, terminated by a spatha, protruding one or two white flowers on slender footstalks drooping downwards, and appearing in March. 2. The æstivum, or summer leucojum, hath a large, oblong, bulbous root, crowned with several long, flat, broad leaves; and amidst them an upright, thick, hollow stalk, 15 or 18 inches high; terminated by a spatha, protruding many white flowers, on slender footstalks, drooping downwards; flowering in May. 3. The autumnale, or autumnal leucojum, hath a large oblong bulbous root, crowned with many narrow leaves, an upright, naked, hollow stalk, terminated by a spatha protruding many white flowers on long weak footstalks, hanging downwards, and flowering in autumn.

*Culture.* All the three species are very hardy, durable in root, and increase exceedingly by offsets, which may be separated every two or three years.

LEUCOMA, in surgery, a dissemper of the eye, otherwise called *albugo*. See *ALBUGO*, and (*Index* subjoined to) *MEDICINE*.

LEUCOPHLEGMATIA, in medicine, a kind of dropsy, otherwise called *anasarca*. See (*Index* subjoined to) *MEDICINE*.

LEUCTRA, (anc. geog.), a town of Bœotia, to the west of Thebes, or lying between Platææ and Thepiæ, where the Lacedæmonians had a great defeat given them by Epaminondas and Pelopidas the Theban generals. The Theban army consisted at most but of 6000 men, whereas that of the enemy was at least thrice that number: but Epaminondas trusted most in his horse, wherein he had much the advantage, both in their quality and good management; the rest he endeavoured to supply by the disposition of his men, and the vigour of the attack. He even refused to suffer

any to serve under him in the engagement, but such as he knew to be fully resolved to conquer or die. He put himself at the head of the left wing, opposite to Cleombrotus king of Sparta, and placed the main fires of the battle there; rightly concluding, that, if he could break the body of the Spartans, which was but 12 men deep, whereas his own was 50, the rest would be soon put to flight. He closed his own with the sacred band, which was commanded by Pelopidas; and placed his horse in the front. His right, from which he had drawn so many men, he ordered to fall back, in a slanting line, as if they declined to fight, that they might not be too much exposed to the enemy, and might serve him for a corps de reserve in case of need. This was the wise disposition which the two Theban generals made of their few, but resolute forces; and which succeeded, in every part, according to their wish. Epaminondas advanced with his left wing, extending it obliquely, in order to draw the enemy's right from the main body; and Pelopidas charged them with such desperate speed and fury, at the head of his battalion, before they could reunite, that their horse, not being able to stand the shock, were forced back upon their infantry, which threw the whole into the greatest confusion: so that though the Spartans were of all the Greeks the most expert in recovering from any surprize, yet their skill on this occasion either failed them or proved of no effect; for the Thebans, observing the dreadful impression they had made on them with their horse, pushed furiously upon the Spartan king, and opened their way to him with a great slaughter.

Upon the death of Cleombrotus, and several officers of note, the Spartans, according to custom, renewed the fight with double vigour and fury, not so much to revenge his death as to recover his body, which was such an established point of honour as they could not give up without the greatest disgrace: but here our Theban general wisely chose rather to gratify them in that point, than to hazard the success of a second onset; and left them in possession of their king, whilst himself marched straight against their other wing, which was commanded by Archidamus, and consisted chiefly of such auxiliaries and allies as had not heartily engaged in the Spartan interest: and these were so disheartened at the death of the king, and the defeat of that wing, that they betook themselves to flight, and were presently after followed by the rest of the army. The Thebans, however, pursued them so closely, that they made a second dreadful slaughter among them; which completed Epaminondas's victory, who remained master of the field, and erected a trophy in memory of it. This was the conclusion of the famed battle of Leuctra, in which the Lacedæmonians lost 4000 men, and the Thebans but 300.

LEVEL, an instrument wherewith to draw a line parallel to the horizon, by means of which the true level, or the difference of ascent or descent between several places, may be found for conveying water, draining fens, &c.

There are several instruments of different contrivance and matter, invented for the perfection of levelling; all of which, for the practice, may be reduced to those that follow.

*Air-LEVEL*, that which shews the line of level by means



Level.

means of a bubble of air inclosed with some liquor in a glass-tube of an indeterminate length and thickness, whose two ends are hermetically sealed. When the bubble fixes itself at a certain mark, made exactly in the middle of the tube, the plane or ruler wherein it is fixed is level. When it is not level, the bubble will rise to one end. This glass-tube may be set in another of brass, having an aperture in the middle, whence the bubble of air may be observed. The liquor wherewith the tube is filled, is oil of tartar, or aqua secunda; those not being liable to freeze as common water, nor to rarefaction and condensation, as spirit of wine is. There is one of these instruments with sights, being an improvement upon that last described, which, by the addition of more apparatus, becomes more commodious and exact. It consists of an air-level, n° 1. about eight inches long, and seven or eight lines in diameter, set in a brass-tube, 2, with an aperture in the middle, C. The tubes are carried in a strong straight ruler, a foot long; at whose ends are fixed two sights, 3, 3, exactly perpendicular to the tubes, and of an equal height, having a square hole, formed by two fillets of brass crossing each other at right angles, in the middle whereof is drilled a very little hole, through which a point on a level with the instrument is described. The brass-tube is fastened on the ruler by means of two screws; one whereof, marked 4, serves to raise or depress the tube at pleasure, for bringing it towards a level. The top of the ball and socket is rivetted to a little ruler that springs, one end whereof is fastened with screws to the great ruler, and at the other end has a screw, 5, serving to raise and depress the instrument when nearly level.

This instrument, however, is yet less commodious than the following one; because though the holes be ever so small, yet they will still take in too great a space to determine the point of level precisely.

This instrument consists of an air-level, with telescope sights. This level (*ibid.* n° 2.) is like the last; with this difference, that, instead of plain sights, it carries a telescope to determine exactly a point of level at a good distance. The telescope is a little brass-tube, about 15 inches long, fastened on the same ruler as the level. At the end of the tube of the telescope, marked 1, enters the little tube 1, carrying the eye-glass and an hair horizontally placed in the focus of the object-glass, 2; which little tube may be drawn out, or pushed into the great one, for adjusting the telescope to different sights: at the other end of the telescope is placed the object-glass. The screw 3, is for raising or lowering the little fork, for carrying the hair, and making it agree with the bubble of air when the instrument is level; and the screw 4, is for making the bubble of air, D or E, agree with the telescope: the whole is fitted to a ball and socket. M. Huygens is said to be the first inventor of this level; which has this advantage, that it may be inverted by turning the ruler and telescope half round; and if then the hair cut the same point that it did before, the operation is just.

It may be observed, that one may add a telescope to any kind of level, by applying it upon, or parallel to, the base or ruler, when there is occasion to take the level of remote objects.

Dr Desaguliers contrived an instrument, by which the difference of level of two places, which could not

be taken in less than four or five days with the best telescope-levels, may be taken in as few hours. The instrument is as follows. To the ball C (*ibid.* n° 3.) is joined a recurve tube BA, with a very fine bore, and a small bubble at top, A, whose upper-part is open. It is evident from the make of this instrument, that if it be inclined in carrying, no prejudice will be done to the liquor, which will always be right both in the ball and tube when the instrument is set upright. If the air at C be so expanded with heat, as to drive the liquor to the top of the tube, the cavity A will receive the liquor, which will come down again and settle at D, or near it, according to the level of the place where the instrument is, as soon as the air at C returns to the same temperance as to heat and cold. To preserve the same degree of heat, when the different observations are made, the machine is fixed in a tin vessel EF, filled with water up to *gh*, above the ball, and a very sensible thermometer has also its ball under water, that one may observe the liquor at D, in each experiment, when the thermometer stands at the same height as before. The water is poured out when the instrument is carried; which one may do conveniently by means of the wooden frame, which is set upright by the three screws S, S, S, *ibid.* n° 4. and a line and plummet P P, n° 5. At the back part of the wooden frame, from the piece at top K, hangs the plummet P, over a brass point at N; *M* are brackets to make the upright board K N continue at right angles with the horizontal one at N. N° 6. represents a front view of the machine, supposing the fore part of the tin-vessel transparent; and here the brass-socket of the recurve-tube, into which the ball is screwed, has two wings at I I, fixed to the bottom, that the ball may not break the tube by its endeavour to emerge when the water is poured in as high as *gh*.

After the Doctor had contrived this machine, he considered, that as the tube is of a very small bore, if the liquor should rise into the ball at A, n° 3. in carrying the instrument from one place to another, some of it would adhere to the sides or the ball A, and upon its descent in making the experiment, so much might be left behind, that the liquor would not be high enough at D to shew the difference of the level: therefore, to prevent that inconvenience, he contrived a blank screw, to shut up the hole at A, as soon as one experiment is made, that, in carrying the machine, the air in A may balance that in C, so that the liquor shall not run up and down the tube, whatever degree of heat and cold may act upon the instrument, in going from one place to another. Now, because one experiment may be made in the morning, the water may be so cold, that when a second experiment is made at noon the water cannot be brought to the same degree of cold it had in the morning; therefore, in making the first experiment, warm water must be mixed with the cold, and when the water has stood some time before it comes to be as cold as it is likely to be at the warmest part of that day, observe and set down the degree of the thermometer at which the spirit stands, and likewise the degree of the water in the barometer at D; then screw on the cap at A, pour out the water, and carry the instrument to the place whose level you would know; then pour in your water, and when the thermometer is come to the same degree as before,

open

Level. open the screw at top, and observe the liquor in the barometer.

The Doctor's scale for the barometer is ten inches long, and divided into tenths; so that such an instrument will serve for any heights not exceeding ten feet, each tenth of an inch answering to a foot in height.

The Doctor makes no allowance for the decrease of density in the air, because he did not propose this machine for measuring mountains, (tho', with a proper allowance for the decreasing density of the air, it will do very well), but for heights that want to be known in gardens, plantations, and the conveyance of water, where an experiment that answers two or three feet in a distance of 20 miles, will render this a very useful instrument.

*Artillery Foot-LEVEL* is in form of a square, having its two legs or branches of an equal length; at a juncture whereof is a little hole, whence hangs a thread and plummet playing on a perpendicular line in the middle of a quadrant. It is divided into twice 45 degrees from the middle, *ibid.* n° 7.

This instrument may be used on other occasions, by placing the ends of its two branches on a plane; for when the thread plays perpendicularly over the middle division of the quadrant, that plane is assuredly level. To use it in gunnery, place the two ends on the piece of artillery, which you may raise to any proposed height, by means of the plummet, whose thread will give the degree above the level.

*Carpenters and Paviers' LEVEL*, consists of a long ruler, in the middle whereof is fitted, at right angles, another somewhat bigger, at the top of which is fastened a line, which, when it hangs over a fiducial line at right angles with the base, shews that the said base is horizontal. Sometimes this level is all of one board. *Ibid.* n° 8.

*Gunnery LEVEL*, for levelling cannons and mortars, consists of a triangular brass plate, about four inches high, *ibid.* 9. at the bottom of which is a portion of a circle, divided into 45 degrees; which number is sufficient for the highest elevation of cannons and mortars, and for giving shot the greatest range: on the centre of this segment of a circle is screwed a piece of brass, by means of which it may be fixed or screwed at pleasure: the end of this piece of brass is made so as to serve for a plummet and index, in order to shew the different degrees of elevation of pieces of artillery. This instrument has also a brass foot, to set upon cannons or mortars, so as, when those pieces are horizontal, the instrument will be perpendicular. The foot of this instrument is to be placed on the piece to be elevated, in such a manner, as that the point of the plummet may fall on the proper degree: this is what they call *levelling the piece*.

*Mason's LEVEL*, is composed of three rules, so joined as to form an isosceles-rectangle, somewhat like a roman A; at the vertex whereof is fastened a thread, from which hangs a plummet, that passes over a fiducial line, marked in the middle of the base, when the thing to which the level is applied is horizontal; but declines from the mark, when the thing is lower on the one side than on the other.

*Plumb or Pendulum LEVEL*, that which shews the horizontal lines by means of another line perpendicular to that described by a plummet or pendulum. This

instrument, *ibid.* n° 10. consists of two legs or branches, joined together at right angles, whereof that which carries the thread and plummet is about a foot and a half long; the thread is hung towards the top of the branch, at the point 2. The middle of the branch where the thread passes is hollow, so that it may hang free every where: but towards the bottom, where there is a little blade of silver, whereon is drawn a line perpendicular to the telescope, the said cavity is covered by two pieces of brass, making as it were a kind of case, lest the wind should agitate the thread; for which reason the silver blade is covered with a glass G, to the end that it may be seen when the thread and plummet play upon the perpendicular: the telescope is fastened to the other branch of the instrument, and is about two feet long; having an hair placed horizontally across the focus of the object-glass, which determines the point of the level. The telescope must be fitted at right angles to the perpendicular. It has a ball and socket, by which it is fastened to the foot, and was invented by M. Picard.

*Reflecting LEVEL*, that made by means of a pretty long surface of water representing the same object inverted which we see erected by the eye, so that the point where these two objects appear to meet is a level with the place where the surface of the water is found. This is the invention of M. Marriotte.

There is another reflecting level consisting of a mirror of steel, or the like, well polished, and placed a little before the object-glass of a telescope, suspended perpendicularly. This mirror must make an angle of 45° with the telescope, in which case the perpendicular line of the said telescope is converted into a horizontal line, which is the same with the line of level. This is the invention of M. Cassini.

*Water-LEVEL*, that which shews the horizontal line by means of a surface of water or other liquor; founded on this principle, that water always places itself level.

The most simple is made of a long wooden trough, or canal, whose sides are parallel to the base; so that being equally filled with water, its surface shews the line of level. This is the chorobates of the ancients. See CHOROBATES.

It is also made with two cups fitted to the two ends of a pipe, three or four feet long, about an inch in diameter, by means whereof the water communicates from the one to the other cup; and this pipe being moveable on its stand by means of a ball and socket, when the two cups become equally full of water, their two surfaces mark the line of level.

This instrument, instead of cups, may also be made with two short cylinders of glass three or four inches long, fastened to each extreme of the pipe with wax or mastic. Into the pipe is poured some common or coloured water, which shews itself through the cylinders, by means whereof the line of level is determined; the height of the water, with respect to the centre of the earth, being always the same in both cylinders: this level, though very simple, is yet very commodious for levelling small distances.

*LEVEL of Mr Huygens's invention*, consists of a telescope A, *ibid.* n° 11. in form of a cylinder, going through a ferril, in which it is fastened by the middle. This ferril has two flat branches b b, one above, and the

Levelling the other below: at the ends whereof are fastened little moving pieces, which carry two rings, by one of which the telescope is suspended to an hook at the end of the screw 3, and by the other a pretty heavy weight is suspended, in order to keep the telescope in *equilibrium*. This weight hangs in the box 5, which is almost filled with linseed oil, oil of walnuts, or other matter that will not easily coagulate, for more aptly settling the balance of the weight and telescope. The instrument carries two telescopes close and very parallel to each other; the eye-glasses of the one being against the object-glasses of the other, that one may see each way without turning the level. In the focus of the object-glasses of each telescope must a little hair be strained horizontally, to be raised and lowered as occasion requires by a little screw. If the tube of the telescope be not found level when suspended, a ferril or ring, 4, is put on it, and is to be slid along till it fixes to a level. The hook on which the instrument is hung, is fixed to a flat wooden cross; at the ends of each arm whereof there is a hook serving to keep the telescope from too much agitation in using or carriage. To the said flat cross is applied another hollow one, that serves as a case for the instrument; but the two ends are left open, that the telescope may be secured from the weather, and always in a condition to be used. The foot of this instrument is a round brass plate, to which are fastened three brass ferrils, moveable by means of joints wherein are put slaves, and on this foot is placed the box.

Nº 12. marked I, is a balance-level; which being suspended by the ring, the two sights, when in *equilibrium*, will be horizontal, or in a level.

LEVELLING, the art of finding a line parallel to the horizon at one or more stations, in order to determine the height of one place with regard to another. See the preceding article.

A truly level surface is a segment of a spherical surface, which is concentric to the globe of the earth. A true line of level is an arch of a great circle, which is imagined to be described upon a truly level surface. This apparent level is a straight line drawn tangent to an arch or line of true level. Every point of the apparent level, except the point of contact, is higher than the true level: thus let EAG (nº 1.) be an arch of a great circle drawn upon the earth; to a person who stands upon the earth at A, the line HD is the apparent level parallel to his rational horizon RR: but this line, the farther it is extended from his station A, the farther it recedes from the centre; for BC is longer than AC, and DC is longer than BC, &c. The common methods of levelling are sufficient for laying pavements of walks, for conveying water to small distances, for placing horizontal dials, or astronomical instruments: but in levelling the bottoms of canals which are to convey water to the distance of many miles, the difference between the apparent and true level must be taken into the account. Thus let IAL (*ibid.* nº 2.) be an arch of a great circle upon the earth: let it be required to cut a canal whose bottom shall be a true level from A to B, of the length of 5078 feet: the common method is to place the levelling instrument in the bottom of the canal at A; and, looking through the sights placed horizontally at a stick set up perpendicular at B, to make a mark where

the visual ray or point of the apparent level points at E, and then to sink the bottom of the canal at B as much below E as A is below D. But this will not give the true level: for, according to Cassini's calculation, at the distance of 5078 feet the apparent level is seven inches above the true; and therefore, to make a true level, B must be sunk seven inches lower than the apparent level directs; so that if A be four feet below D, B must be four feet seven inches below the mark E. We have here mentioned the error which will arise from placing the level at one end of the line to be levelled, and shewn how to correct it; but in most cases it is better to take a station in the middle of the line to be levelled: thus, if the points H and B are to be levelled, place the instrument in the middle at A, and setting up sticks perpendicular at H and B, make marks upon each stick where the apparent level points, as E and F; those points are level: and if you sink H as much below F, as B is below E, HAB will be a true level.

The operation of levelling is as follows. Suppose the height of the point A (*ibid.* nº 3.) on the top of a mountain above that of the point B, and at the foot thereof, be required. Place the level about the middle distance between the two points as in D, and staffs in A and B; and let there be persons instructed with signals for raising and lowering, on the said staffs, little marks of pasteboard or other matter, the level being placed horizontally by the bubble, &c. Look towards the staff AE, and cause the mark so raised to be lowered till the middle, upper edge, or other most conspicuous part, appear in the visual ray. Then measuring exactly the perpendicular height of the point E above the point A, which suppose six feet four inches; set that down in your book; then turn the level horizontally about, that the eye-glasses of the telescope may be still next the eye when you look the other way; if you have only plain sights, the instrument need not be turned; and cause the person at the staff B, to raise or lower his mark, till some conspicuous part of it fall in the visual ray, as at C: then measure the perpendicular height of C above B, which suppose sixteen feet six inches; set this also down in the book above the other number of the first observation; subtract the one from the other, and the remainder will be ten feet two inches, which is the difference of the level between A and B, or the height of the point A above the point B.

If the point D, where the instrument is fixed, be in the middle between the two points A and B, there will be no necessity for reducing the apparent level to the true level; the visual ray in that case being raised equally above the true level. If it be further required to know whether there be a sufficient descent for conveying water from the spring A (*ibid.* nº 4.) to the point B. Here, in regard the distance from A to B is considerable, it is required that several operations be made. Having then chosen a proper place for the first station, as at I, set up a staff in the point A, near the spring, with a proper mark to slide up and down the staff, as L; and measure the distance from A to I, which suppose 2000 yards. Then the level being adjusted in the point I, let the mark L be raised and lowered till such time as you spy some conspicuous part of it through the telescope or sights of the level, and measure the height AL, which suppose thirteen feet



feet five inches. But in regard the distance A I is 2000 yards, you must have recourse to your table for a reduction, subtracting 11 inches, which will leave the height of A L twelve feet six inches; and this note down in your book. Now turn the level horizontally about, so that the eye-glass of the telescope may be towards A; and, fixing up another staff at H, cause the mark G to be moved up and down till you spy some conspicuous part through the telescope or sights. Measure the height H G, which suppose seven yards one foot two inches. Measure likewise the distance of the points I H, which suppose 1300 yards; for which distance four inches eight lines must be subtracted from the height H G, which consequently will only leave seven yards nine inches four lines, to be taken down in your book. This done, remove the level forwards to some other eminence, as E, whence the staff H may be viewed; as also another staff at D, near the place whither the water is to be conveyed. The level being again adjusted in the point E, look back to the staff H; and managing the mark as before, the visual ray will give the point F. Measure the height H F, which suppose eleven feet six inches. Measure likewise the distance H E, which suppose 1000 yards, for which there is two inches nine lines of abatement; which being taken from the height H F, there will remain eleven feet three inches three lines; which enter in your book: Lastly, turning the level to look at the next staff D, the visual ray will give the point D. Measure the height of D from the ground, which suppose eight feet three inches. Measure also the distance from the station E to B, which suppose 900 yards, for which distance there are two inches three lines of abatement; which being taken from the height B D, there will remain eight feet nine lines; which enter as before.

For the manner of entering down observations in your book, observe, that when a proper place or station for the level between the two points has been pitched upon, write down the two heights observed at that station in two different columns, viz. under the first column, those observed in looking through the telescope when the eye was from the spring, or towards the point, which we may call *back-sights*; and under the second column, those observed when the eye was next the spring, which we call *fore-sights*. Having summed up the heights of each column separately, subtract the lesser from the greater, the remainder will be the difference of the level between the points A and B. If the distance of the two points be required, add all the distances measured together; and dividing the difference of height by the yards of the distances, for each 200 yards you will have a descent of about two inches nine lines.

Dr Halley suggests a new method of levelling, performed wholly by means of the barometer, in which the mercury is found to be suspended to so much the less height, as the place is farther remote from the centre of the earth; whence the different heights of the mercury in two places give the difference of level. This method has been put in practice by some of the French academy.

**LEVELLING-Staves**, instruments used in levelling, serving to carry the marks to be observed, and at the same time to measure the heights of those marks from the ground. They usually consist each of two long

wooden rulers, made to slide over one another, and divide into feet, inches, &c.

**LEVER**, in mechanics, is a bar of iron or wood, one part of which being supported by a prop, all other parts turn upon that prop as their centre of motion. This instrument is of two kinds. First, the common sort, where the weight we desire to raise, rests at one end of it, our strength is applied at the other end, and the prop is between both. When we stir up the fire with a poker, we make use of this lever; the poker is the lever, it rests upon one of the bars of the grate as a prop, the incumbent fire is the weight to be overcome, and the other end held in the hand is the strength or power. In this, as in all the rest, we have only to increase the distance between the strength and prop, to give the man that works the instrument greater power.

The lever of the second kind, has the prop at one end, the strength is applied to the other, and the weight to be raised rests between them. Thus in raising the water-plug in the streets, the workman puts his iron lever through the hole of the plug till he reaches the ground on the other side, and, making that his prop, lifts the plug with his strength at the other end of the lever. In this lever also, the greater the distance of the prop from the strength, the greater is the workman's power.

These instruments, as we see, assist the strength; but sometimes a workman is obliged to act at a disadvantage, in raising either a piece of timber or a ladder upon one end. We cannot, with grammatical propriety, call this a *lever*, since such a piece of timber in fact in no way contributes to raise the weight. In this case, the man, who is the strength or power, is in the middle, the part of the beam already raised is the weight, the part yet at the ground is the prop, on which the beam turns or rests. Here the man's strength will be diminished, in proportion to the weight it sustains. The weight will be greater the farther it is from the prop, therefore the man will bear the greater weight the nearer he is to the prop. See **MECHANICS**.

**LEVERET**, among sportsmen, denotes a hare in the first year of her age.

**LEVIGATION**, in pharmacy and chemistry, the reducing hard and ponderous bodies to an impalpable powder, by grinding them on a porphyry, or in a mill. See **CHEMISTRY**, n° 97.

**LEWDNESS**. See **FORNICATION**.

**LEVITE**, in a general sense, means all the descendants of Levi, among whom were the Jewish priests themselves, who, being descended from Aaron, were likewise of the race of Levi.—In a more particular sense, *Levite* is used for an order of officers in that church, who were employed in performing the manual service of the temple; such as in fetching wood, water, and other things necessary for the sacrifices; and in singing, and playing upon instruments of music.

The consecration of the Levites was to be performed with the following ceremonies: They were to be sprinkled with the water of expiation, to shave all their flesh, and wash their clothes: they were then to bring two bullocks before the door of the tabernacle, where the whole congregation laid their hands upon the Levites heads: the bullocks were then sacrificed, one for a burnt-offering, and the other for a sin-offering; and,

**Leviticus** lastly, they were to be presented to the high-priest, who was to consecrate them to the Lord.

**Levy.**

The Levites were subdited by the tythe of all the corn, fruit and cattle, throughout Israel; a tythe of which tythe they were to give to the priests: they had also 48 cities for their habitation; and while they were actually employed in the service of the temple, they were subdited out of the daily sacrifices.

**LEVITICUS**, a canonical book of the Old Testament, so called from its containing the laws and regulations relating to the priests, Levites, and sacrifices.

**LEVITY**, in physiology, the privation or want of weight in any body when compared with another that is heavier than it; in which sense it stands opposed to gravity.

**LEUK**, a town of Switzerland, almost in the middle of the Valais; remarkable for its natural strength, for the assembly of the states that often meet there, and for its baths, whose water is so hot that they will boil eggs.

**LEUSDEN** (John), a celebrated philologist, born in 1624. He studied the learned languages and mathematics at Utrecht; and then went to Amsterdam, to converse with the rabbis, and perfect himself in the Hebrew tongue. After which he was professor of Hebrew at Utrecht, where he acquired a great reputation, and died in 1699. He wrote many valuable works; the principal of which are, 1. *Onomasticum Sacrum*, 8vo. 2. *Clavis Hebraica & Philologica Veteris Testamenti*, 4to. 3. *Novi T. Clavis Græca, cum Annotationibus Philologicis*, 8vo. 4. *Compendium Biblicum Veteris Testamenti*, 8vo. 5. *Compendium Græcum Novi Testamenti*, the best edition of which is that of London, in 1688, 12mo. 6. *Philologus Hebraeus*, 4to. 7. *Philologus Hebræo-mixtus*, 4to. 8. *Philologus Hebræo-Græcus*, 4to. 9. Notes on Jonas, Joel, Hosea, &c. He also gave correct editions of several learned works.

**LEUTKIRK**, a free and imperial town of Germany, in Suabia, and in Algow, seated on a rivulet that falls into the Illar, in E. Long. 10. 10. N. Lat. 47. 53.

**LEUTMERITZ**, a town of Bohemia, capital of a circle of the same name, with a bishop's see, seated on the river Elbe, in E. Long. 14. 25. N. Lat. 50. 34.

**LEWARDEN**, a handsome, rich, and strong town of the United Provinces, capital of Oostergow, Westergow, Sevenwolden, and West Friesland. It was the usual place of residence of the Stadtholder; and in buildings, as well public as private, is very magnificent. It has several canals running through the streets, which are of great service to their trade, especially as they are continued to the sea and to the most considerable towns of the province. E. Long. 5. 42. N. Lat. 53. 12.

**LEUWENHOEK** (Anthony de), a celebrated Dutch physician and naturalist, was born at Delft, in 1632, of an ancient family of that city; and acquired a very great reputation throughout all Europe, by his experiments and discoveries. He particularly excelled in making glasses for microscopes and spectacles, and died in 1723. His letters to the royal society of London, of which he was a member, were printed at Leyden, in 1722, in 4to.

**LEVY**, in law, signifies to gather or collect; as to

levy money, and to levy a fine of lands in the passing **Lewentz** a fine.

**LEWENTZ**, a town of Upper Hungary, in the county of Gran, and on the river of the same name, where the Turks were defeated in 1644. E. Long. 18. 19. N. Lat. 48. 15.

**LEWES**, a town of Suffex in England, seated on an eminence on the banks of the river Ouse. It is a large well built place, hath two streets paved, and six parish-churches built with flint-stone. It contains about 1500 houses, and upwards of 6000 inhabitants. E. Long. 0. 5. N. Lat. 50. 50.

**LEWIS**, one of the largest of the Hebrides or western islands of Scotland, extending 100 miles in length from north to south, and from 13 to 14 in breadth, consisting of a great number of isles and rocks, and parted by the sea into two divisions, called *Lewis* and *Harries*, the former lying to the westward of the other. Lewis belongs to the shire of Ross; is divided by several channels, distinguished by several names, and portioned out among different proprietors; but the *Lewis*, strictly so called, stretches about 36 miles in length, from the north point of Bowling-head to the southern extremity of Hushiness in Harries. The air is temperately cold, moist, and healthy; great parts of the low ground is flooded with lakes; the rest is arable in many places, and has been counted fruitful in oats, barley, rye, flax, and hemp. The soil in these parts is a light sand, which the inhabitants manure with foot and sea-ware; but great part of the island is covered with heath. The labouring people dig the land with spades, and break the clods with small harrows, the foremost teeth of which are made of wood, and the remainder of rough heath, which smooths what the others have broke; and this harrow is drawn by one man, having a strong trace of horse-hair across his breast. Of their corn they not only make malt for ale, but likewise a strong spirit called *treffareg*, which is the whisky, or usquebaugh, three times distilled. Lewis abounds with convenient bays and harbours, namely, Lochthornvay, on the east side; the Birken isles, about seven miles farther southward; Loch-cresfort, three miles more to the south; Loch-seafort, about five miles still farther in the same direction; Loch-carlavy, a capacious and secure harbour, about 24 miles to the south-west; and Loch-rague, four miles more southerly on the same coast; all these bays abound with cod, ling, and herring; here are likewise whales of different sizes, which the natives drive into the bays, and kill with harpoons. Fifty young whales have been killed on this coast in one season; and their flesh was eaten by the natives, who count it salutary and toothsome, distinguishing it by the name of *sea-pork*. These bays afford great plenty of shell-fish; such as clams, oysters, cockles, mussels, limpets, welks; and such a prodigious quantity of spout-fish is sometimes cast up from the sand off Loch-tua, that they infect the air, and render it unhealthy to the neighbouring inhabitants, who are not able to consume them, either by eating, or using them as manure for the ground. Some of these lochs and bays likewise produce small coral and coralline. The fresh-water lakes are well stored with trout and eels, and the rivers yield plenty of salmon. Along the coast are found a great number of caves, which serve as shelter for the seals

seals and otters, which are also eaten as dainties by the inhabitants; and vast numbers of sea-fowl build upon the rocks and promontories.

The land-animals reared in this island, are cows, horses, sheep, goats, hogs, and deer; all these are of a diminutive size. The beef, mutton, and pork, are juicy and delicious; the horses are active and hardy; the deer, which are of the red kind, confine themselves to the chase of Oseval, about 15 miles in compass, which affords tolerable pasturage; but in the winter, when the ground is covered with frost and snow, these animals are forced to feed on sea-ware, and endure all the rigour of the season, without any shelter from wood or copse, for there is not a tree to be seen; nevertheless, the roots of very large trees, which have been cut by the ax, are found in different places. There is likewise a small grove of birch and hazle on the south-west side of Loch-Stornaway.

The inhabitants of Lewis are in general well-proportioned, tall, fair, sanguine, strong, and healthy. The small-pox sometimes makes terrible havoc among them. The other diseases to which they are subject, are the chin-cough in children, the fever, the diarrhæa, dysentery, fore-throats, jaundice, stitches, pleuritis, coughs, and rheums. As a medicine for the diarrhæa and dysentery, they administer the kernel of the black Molucca beans, powdered and drank in boiled milk; and sometimes the patient swallows a small dose of their strong whisky diluted with water. This is likewise prescribed to children in the small-pox, when the pulse sinks and the pustules do not fill. Inflammatory disorders they cure by repeated bleeding; coughs and colds are removed by drinking plentifully of warm brochan, or water-gruel, with butter or honey, taken at bed-time; which not only acts as a balsamic pectoral, but wonderfully promotes the discharge of sweat and urine. When the ovula are enlarged, they snip off part of it with a pair of scissors: for the jaundice, they sluice a pail-full of cold water by surprise on the patient's naked back, or fear the vertebra with an actual cautery when he dreams of no such application. Green wounds they cure with ointments made of vulnerary plants and fresh-butter.

The natives of Lewis are quick of apprehension; ingenious in mechanics; and much addicted to poetry and music, many of them learning to play on the bagpipe and violin. They are in general sober, circum-spect, and hospitable; dexterous in shooting, swimming, leaping; bold and skillful mariners; and so temperate, that they will tug at the oar all day, without any other provision than bread and water, with a snuff of tobacco.

Along this coast we see several natural mounts or forts, called *Dun*, such as Dun-rowly, Dun-coracl, and Dun-eisten. There are also the remains of some old castles, and other monuments of antiquity. At Stornavay village we see the ruins of a fortress destroyed by the English garrison sent thither by Oliver Cromwell. To the northward of Brago there is a round tower built of large stones, three stories high, tapering towards the top, with a double wall, and a circular staircase between, by which one may go quite round the building. On the heaths and summits of hills there are several cairns or heaps of stones, which served either for graves or beacons. In the parish of

Barvas we see a single stone called the *thruspet*, standing upright, above 20 feet high, and almost as much in breadth. Three stones, about 12 feet high each, are seen standing on the north side of Loch-carlway; and many others standing tingle at great distances, and in remote parts of the island. But the most remarkable monument of this kind appears by the village of Claferniss. Here we find 39 pyramidal stones standing upright, about six or seven feet high from the surface, each about two feet in breadth. They are placed in form of an avenue, eight feet wide; the distance between every stone amounting to six feet, and a single piece stands at the entrance. This avenue leads to a circle of 12 stones of the same dimensions, with one in the centre 13 feet in length, and shaped like a rudder: on the east, south, and west sides of this circle, are four stones, such as those that compose this round and avenue, forming three lines, or as it were rays, from the body of the circle. This is supposed to have been a Druid temple; and tradition reports, that the chief Druid stood by the large stone in the centre, and harangued the audience. At the distance of a quarter of a mile there is another circle of the same nature; but without the range and avenue. In all probability, these, as well as the monuments we have described in our account of the Orkneys, and Stone-henge on Salisbury-plain, were places of worship erected by the Druids in time of Pagan superstition. The chief town in Lewis is called *Storn-bay*, from its situation at the head of the bay known by this name: it is a village, consisting of about 60 families, with a church, a grammar-school, and some public-houses: here also resides the steward for the laird of Macleod, who is a proprietor of the island.

There is a considerable number of inferior adjacent isles and rocks, some of which hardly deserve to be mentioned; such as the small island Garve at the mouth of Loch Carlway, Berinlay, Fladda, Bernera Minor, and Bernera Major, Kialily, Cayay, Carvay, Greum, Pabay, Shirem, Vexay, Wuya the Larger and Lesser, and the Flannan islands, which the seamen denominate the *northern hunters*. These are visited every summer by the inhabitants of the Lewis, who go thither in quest of fowls, eggs, down, quills, and feathers, as well as to shear or kill the sheep that are kept here for pasture. As these islands are very steep and rocky, the visitors, after having landed and climbed up the rock by a ladder, uncover their heads, and, making a turn sun-ways, thank God for having escaped the danger they have undergone. In the largest island are the ruins of a chapel dedicated to St Flannan, from whom the isles derive their name. Thither the fowlers repairing, strip themselves of their upper garments, which being laid upon a stone, they advance towards the altar, and repeat three prayers; an exercise which is performed every morning and evening. They observe many other superstitious customs during their residence on these rocks; and when they have landed their boat with their purchase, return to the larger islands. Among the islands belonging to the Lewis, we may likewise take notice of the small isle of Pigmies, so called, because bones resembling those of human creatures, but of very small dimensions, have been dug out of the ground.

The islands of Lewis are divided into the two parishes



Lewis.

of Darvas and Eye, and in each of these one minister is settled; but there is a great number of churches and chapels dedicated to different saints, in the different isles which compose this cluster. All these were sanctuaries before the reformation, but now they are divested of that privilege. The people of these islands are Presbyterians, with a few Protestants of the English communion, and a still smaller number of Roman Catholics. The Protestants observe the festivals of Christmas, Good Friday, Easter and Michaelmas; on the last of which the individuals of both sexes perform an univerſary cavalcade.

LEWIS, or LOUIS, the name of several kings of France. See FRANCE.

LEWIS VII. anno 1137, was the first who had the courage to oppose the encroachments of the popes on the regal authority: pope Innocent II. excommunicated him for appointing an archbishop of Bourges; but Lewis defended his prerogatives, and put the priests to death who had been the authors of the quarrel. In 1147, he put himself at the head of an army of 80,000 men, and marched against the Saracens, in the second crusade, but was defeated; and returning into France by sea, was taken by the Greeks, but rescued by Roger king of Sicily. His queen Eleonora accompanied him in this expedition; and being suspected of infidelity with Saladin, a young Turk, Louis divorced her, and she was married six weeks after to Henry duke of Normandy, (Henry II. king of England). Lewis died in 1180, aged 60.

Lewis IX. anno 1226, (canonized), was one of the greatest monarchs of France; equally memorable for his valour and his virtues, but unfortunately misled by the superstition of the times: he sacrificed his own repose, and the welfare of his kingdom, to the folly of crusading. In 1248, leaving France to the care of his mother, he embarked for Egypt, attended by his queen, his three brothers, and the flower of the French nobility. At first, his victories were rapid: he took Damietta in 1249; but the following year he was defeated and taken prisoner by the Turks, with all the nobility in his train, and the greatest part of his army. The sultan sent to him in prison, to demand an exorbitant sum for his ransom; and his answer being truly noble, deserves to be recorded: "Tell the sultan, that a king of France is not to be ransomed with money; I will give the sum required for my people, and Damietta for myself." These terms were accepted, and a peace of 10 years ensued. Upon his return to France, he diminished the taxes, revoked those which the cupidity of the financiers had introduced; issued several salutary edicts; founded several churches and hospitals; and effectually overturned the ecclesiastical jurisdiction of the court of Rome, by his pragmatic sanction in 1269, which established the independency of the Gallican church. Thirteen years residence in his capital indemnified his subjects for his absence; but his pious zeal prevented the enjoyment of this happiness: he embarked for the sixth crusade in 1270; and died the same year, at the siege of Tunis, aged 55.

Lewis XI. anno 1461. His oppressions obliged his subjects to enter into a league against him, styled, "*Ligue du bien public*," in which his brother the duke of Berri and some of the principal nobility were concerned: they solicited succours from John duke of Cala-

bria, who joined them with 500 Swifs (the first introduction of Swifs soldiers into the French armies). His reign was almost one continued scene of civil war; and it is computed that 4000 of his subjects were executed in public and privately, either for being in arms against him, or suspected by him. In his last illness, he drank the warm blood of children, in the vain hope of restoring his decayed strength. He died in 1483, aged 60. The pofts for letters were established in his reign, owing to his eagerness for news; the first institution of this nature in Europe.

Lewis XII. anno 1492, styled the *Just*, and the *Father of his people*; memorable for his valour in the field, and his wisdom in the cabinet. A great general; but unfortunate towards the end of his reign, when he did not command his troops in person: his orders transmitted from home were misunderstood, or wilfully disobeyed; and he had the mortification, before he died, to see the total expulsion of the French from the possessions he had acquired for them by his personal bravery. At 53 years of age, he married the princess Mary of England, sister of Henry VIII. and being of a delicate constitution, fell a victim (according to the French historians) to amorous dalliance; for he died in about two months after his nuptials, in 1515.

Lewis XIII. anno 1610, increased the military reputation of his country, and made considerable additions to its domains. The beginning of his reign was occupied in civil wars with his mother and his Protestant subjects; in which he was excited to continue by his famous minister, cardinal Richlieu, who attended him to the siege of Rochelle, the bulwark of the Huguenot party. This place was reduced by famine to surrender, in 1628, after a siege of more than a year. Upon this, and other occasions, the king gave proofs of great personal bravery. His attachment to his ally the duke de Nevers, who succeeded to the duchy of Mantua, but was refused the investiture by Charles VI. emperor of Germany, involved him in a war with that prince, the Spaniards, and the duke of Savoy; in which Lewis was victorious, and obtained a treaty of peace, by which the duke of Mantua was guaranteed in the possession of his dominions. In 1635, a new war broke out between France and Spain, and the emperor took part with the latter: it lasted 13 years against the emperor, and 25 against Spain, with various success; and the different armies kept on foot, in the Low Countries, on the frontiers of France, and in Italy, in the first years of this war, paved the way for the signal successes of Lewis XIV. the campaigns of these armies being a military school of discipline and experience for the French officers, besides giving them a knowledge of the countries which became the seat of war in the next reign. Lewis XIII. died 1643, aged 41.

Lewis XIV. le *Grand*, (king at five years of age), anno 1643. He was at first styled *Dieu-donne*, because the French considered him as the gift of heaven, granted to their prayers after the queen had been barren 22 years. This prince (Ann of Austria) was declared regent by Lewis XIII. and saw herself under a necessity to continue the war against Philip IV. king of Spain, her brother. The duke d'Enguin was made general of the French armies; and so signal was the success of this renowned warrior, (afterwards prince

Lewis.

Lewis,  
Leyden.

prince of Condé, and known by the style of the *Great Condé*, that his victories brought on the advantageous treaties of Munster in 1648, between France, the emperor Ferdinand III. and Christina queen of Sweden: the basis of the aggrandisement of France in this reign; the principal events of which, and of the next, are related under the articles *BRITAIN*, *UNITED PROVINCES*, &c. *LEWIS XIV.* died in 1715, aged 77.

*LEWIS XV.* (his great-grandson) succeeded in 1715. He was styled, in the course of his reign, *the well-beloved*, which he lost some years before he died; and was detested and despised by his subjects for his shameful attachment to a young girl, under the title of his *mistress*, who, by the ministry of her patron the duke d'Aiguillon, governed the kingdom, and invaded the ancient rights and privileges of the people. He died in 1774, in the 64th year of his age, and 59th of his reign.

*LEYDEN*, in Latin *Lugdunum Batavorum*, one of the largest and finest cities in Holland, abounds with canals, along which are rows of lofty trees that afford very pleasant walks. An arm, or small branch of the Rhine, runs through it. Over the canals are 145 bridges, most of them of stone or brick. The university here is the oldest in the United Provinces: it has large privileges; a library well furnished, and particularly rich in manuscripts; a physic-garden well stocked with all sorts of plants, many of which have been brought from the Cape of Good Hope and the East Indies; an anatomy-hall, well provided with skeletons; and an observatory. The professors, who are generally very eminent, read public lectures four times a-week, for which they take no money; but about three guineas are paid for a course of private lectures, which lasts a whole year. The students have no distinct habit, but all wear swords, though they generally go to the public and private lectures in their night-gowns and slippers. The salaries of the professors are from 100*l.* to 200*l.* a-year: they wear gowns only when they preside at public disputations, read public lectures, or meet in the senate; and their lectures are always in Latin. The students do not lodge in the university, but where they please in the town. The cloth manufacture here is much decayed, which formerly flourished to such a degree, that 100,000 pieces, it is said, have sometimes been made in a year. The city is famous for the long and severe siege it maintained in 1573 against the Spaniards. We cannot help mentioning the reply of that illustrious magistrate, Adrian de Vries, when the citizens represented to him the havoc made by the famine during the siege, and insisted upon his surrendering: "Friends, (said he), here is my body, divide it among you to satisfy your hunger, but banish all thoughts of surrendering to the cruel and perfidious Spaniard." They took his advice, in regard to their not surrendering, and never would listen to any overtures; but told the Spaniards, they would hold out as long as they had an arm to eat and another to fight. There are some fine churches here, and many long, broad, handsome streets; but the Papists, as at Harlem, are more numerous than the Protestants.

*LEYDEN Phial*, a phial coated on the inside and outside with tinfoil, or other proper conducting substance, and furnished with a brass wire and knob, for giving

the electrical shock. See *ELECTRICITY*, n° 25, 38, 62, 102, &c.

*LEYTE*, one of the Philippine islands in the East Indies, situated in E. Long. 118. o. N. Lat. 11. o. Its greatest length is about 40 leagues, and its circumference about 90 or 100. Its soil on the east side is very fruitful; but there are very high mountains which cut it almost through the middle, and occasion so great an alteration in the air, that when it is winter on the north-side, it is summer on the southern part of the island. Thus when the inhabitants of one half of the year reap, the others sow; and they have two plentiful harvests in a year, to which the rivers running down from the abovementioned mountains contribute not a little. The island contains about 9000 inhabitants, who pay tribute to the Spaniards in rice, wax, and quilts. The people have two good customs; the first, to entertain each other interchangeably when they travel; the other, never to alter the price of provisions on account of any scarcity, and this under severe penalties.

*LHUYD*, or *LHOYD* (Humphrey), a learned antiquarian of the 16th century, born at Denbigh, who applied himself to the study of physics, and living mostly within the walls of Denbigh castle, practised there as a physician; sometimes diverted himself with music; and died in 1570, with the character of a well-bred gentleman. He wrote, and translated, several pieces relative to history and antiquities; in particular "The history of Cambria, now called *Wales*, from Caradoc of Langarvan, &c." but died before it was finished: however Sir Henry Sidney, lord president of Wales, employed Dr David Powel to finish it, who published it in 1584. A new and improved edition of this work was published in 1774.

*LIBANIUS*, a famous Greek rhetorician and sophist in the 4th century, was born at Antioch, and had a great share in the friendship of Julian the Apostate. That prince offered him the dignity of *Præfectus Prætorio*; but Libanius refused it, thinking the name of *sophist*, or *professor of eloquence*, much more honourable. There are still extant several of his letters and Greek orations, by which he acquired great reputation; but his style is somewhat affected and obscure. He was a pagan. Basil and Chrysostom were his disciples about the year 360. His letters were published at Amsterdam in 1738; his orations at Venice, 1755.

*LIBANUS*, the name of a chain of mountains of Turkey in Asia, which lie between Proper Syria and Palestine, extending from west to east, from the Mediterranean Sea as far as Arabia. The summits of these mountains are so high, that they are always covered with snow; but below are very pleasant and fruitful valleys. They were formerly famous for the great number of cedar-trees growing thereon; but now there are scarce any remaining. Geographers distinguish them into Libanus and Antilibanus; the latter of which lies on the south side of the valley, rising near the ruins of Sidon, and terminates at others in Arabia; in N. Lat. 34. They are separated from each other at an equal distance throughout; and form a basin, or country, called by the ancients *Cælo-Syria*.

*LIBATION*, a religious ceremony among the ancient pagans, which consisted in an effusion of liquors poured

Leyte  
Libation.

Libellus, poured on the head of the victims prepared for sacrifice.

Libations were also in use among the Hebrews, who poured an hin of wine on the victim after it was killed, and the several pieces of the sacrifice were laid on the altar, ready to be consumed in the flames.

LIBAW, a sea-port town of Courland, lying on the Baltic Sea, consisting entirely of wooden houses. It belongs to the duke of Courland, and is situated in E. Long. 21. 27. N. Lat. 56. 27.

LIBEL, (*libellus famosus*), taken in its largest and most extensive sense, signifies any writing, picture, or the like, of an immoral or illegal tendency; but, in a peculiar sense, is used to denote a malicious defamation of any person, and especially a magistrate, made public by either printing, writing, signs or pictures, in order to provoke him to wrath, or expose him to public hatred, contempt, and ridicule. The direct tendency of these libels is the breach of the public peace, by stirring up the objects of them to revenge, and perhaps to bloodshed. The communication of a libel to any one person is a publication in the eye of the law: and therefore the sending an abusive private letter to a man is as much a libel as if it were openly printed, for it equally tends to a breach of the peace.

With regard to libels in general, there are, in many other cases, two remedies; one by indictment and another by action. The former for the public offence; for every libel has a tendency to break the peace, or provoke others to break it: which offence is the same whether the matter contained be true or false; and therefore the defendant, on an indictment for publishing a libel, is not allowed to allege the truth of it by way of justification. But in the remedy by action on the case, which is to repair the party in damages for the injury done him, the defendant may, as for words spoken, justify the truth of the facts, and show that the plaintiff has received no injury at all. What was said with regard to words spoken, will also hold in every particular with regard to libels by writing or printing, and the civil actions consequent thereupon: but as to signs or pictures, it seems necessary always to show, by proper *innuendo's* and averments of the defendant's meaning, the import and application of the scandal, and that some special damage has followed; otherwise it cannot appear, that such libel by picture was understood to be levelled at the plaintiff, or that it was attended with any actionable consequences.

In a civil action, then, a libel must appear to be false, as well as scandalous; for, if the charge be true, the plaintiff has received no private injury, and has no ground to demand a compensation from himself, whatever offence it may be against the public peace: and therefore, upon a civil action, the truth of the accusation may be pleaded in bar of the suit. But, in a criminal prosecution, the tendency which all libels have to create animosities, and to disturb the public peace, is the sole consideration of the law. And therefore, in such prosecutions, the only points to be considered are, first, the making or publishing of the book or writing; and, secondly, whether the matter be criminal: and, if both these points are against the defendant, the offence against the public is complete. The punishment of such libellers, for either

making, repeating, printing, or publishing the libel, is a fine, and such corporal punishment as the court in its discretion shall inflict; regarding the quantity of the offence, and the quality of the offender. By the law of the twelve tables at Rome, libels, which affected the reputation of another, were made a capital offence: but, before the reign of Augustus, the punishment became corporal only. Under the emperor Valentinian it was again made capital, not only to write, but to publish, or even to omit destroying them. Our law, in this and many other respects, corresponds rather with the middle age of Roman jurisprudence, when liberty, learning, and humanity, were in their full vigour, than with the cruel edicts that were established in the dark and tyrannical ages of the ancient *decemviri*, or the later emperors.

In this, and other instances, where blasphemous, immoral, treasonable, schismatical, seditious, or scandalous libels are punished by the English law, some with a greater, others with a less degree of severity; the *liberty of the press*, properly understood, is by no means infringed or violated. See *LIBERTY of the Press*.

LIBELLA, or LIBELLULA, in the history of insects, a genus of four-winged flies, called in English *dragon-flies* or *adder-flies*; the characters of which are these: The mouth is furnished with jaws: the feelers are shorter than the breast; and the tail of the male terminates in a kind of hooked forceps. There are 21 species, chiefly distinguished by their colour. They have all two very large and reticulated eyes, covering the whole surface of the head. They fly very swiftly; and prey upon the wing, clearing the air of innumerable little flies. They are found in August and September in our fields and gardens, especially near places where there are waters, as they have their origin from worms living in that element. The great ones usually live all their time about waters; but the smaller are common among hedges, and the smallest of all frequent gardens. The smaller kind often settle upon bushes, or upon the ground; but the large ones are almost always upon the wing, so that it is very difficult to take them. Their eyes are beautiful objects for the microscope.

The manner of this insect's coupling with the female is a thing that has attracted the observation and admiration of multitudes, as they are frequently seen, in the hotter months, in that state, flying together about the edges of waters.—Mr Homberg of the Academy of Paris has taken a great deal of pains to inform the world of the whole secret of this strange coitus, and of several other remarkable particulars regarding the creature. The species in which he observed it, is the common libella with a blue body, and large black spots on the wings; and is one of the middle size between the largest and least of these creatures, and is very frequent in moist places in June, July, and August. When the male of this species finds the female sitting upon a leaf or stick, he seizes her as he flies, taking fast hold of her, with the hooks at the anus, by the neck, or that part which joins the head to the breast, and immediately flies away with her, holding her fixed by the neck to the end of his tail. It would not be unnatural, on this occasion, to imagine that they were one species of animal running



away with another to devour it: but this thought must be of short duration, since the female will be soon observed to make no attempts to get away; but, on the contrary, to contrive, as well as she can, to be the better carried, and that with less trouble to the male. He does not however carry his female far before he settles himself upon some plant, and raises his tail so that the female may be brought to sit easily under him upon the same plant. As soon as the female is thus seated, she turns up her tail, and brings it between the legs of the male; then places it to a certain part of the breast of the male, in which are the organs of generation in that sex. All this while the male keeps his hold of her neck with his forceps or hooks. They usually remain in this posture about three minutes; and, after that, the male gently raising up his breast, they become separated, and leaving the hold he had on her neck at the same time, he flies away as he pleases. The female usually remains on the place for half a quarter of an hour, and then flies away also.—Mr Homberg having observed the coupling of these animals thus far, was determined to examine the organs used in it, by dissection. His anatomical observations may be seen in Mem. Acad. Paris. 1699.

**LIBER**, in vegetables, the bark or rind, principally of trees. This is to be conceived as consisting of a number of cylindric and concentric surfaces whose texture is reticular, and in some trees plainly extrusible every way, by reason that the fibres are soft and flexible. While in this condition, they are either hollow regular canals, or, if not so, they have interstitial spaces which serve the office of canals. The nutritious juice which they are continually receiving, remains in part in them, makes them grow in length and thickness, and strengthens and brings them closer together; and by this means the texture which was before reticular becomes an assemblage of straight fibres ranged vertically and parallel to each other; that is, as they are thus altered behind one another, they by degrees become a new substance more woody, called *blea*.

**LIBERALIA**, in Roman antiquity, the same with the Dionysia of the Greeks. See **DIONYSIA**.

**LIBERIA**, in Roman antiquity, a festival observed on the 16th of the kalends of April, at which time the youth laid aside their juvenile habit for the toga virilis, or habit peculiar to grown men. See the article **TOGA**.

**LIBERTAS**, **LIBERTY**, in Pagan worship, one of the blessings deified by the Romans, was represented in the form of a virgin clothed in white, holding a sceptre in her right hand and a cap in her left. To this imaginary goddess they erected temples and altars, where they offered up petitions for the preservation of their liberties.

**LIBERTUS**, in Roman antiquity, a person who from being a slave had obtained his freedom.—The difference between the *liberti* and *libertini* was this: the *liberti* were such as had been actually made free themselves, and the *libertini* were the children of such persons.

**LIBERTY**, denotes a state of freedom, in contradistinction to *slavery* or *restraint*; and may be considered as either *natural* or *civil*.

The absolute rights of man, considered as a free

agent, endowed with discernment to know good from evil, and with power of choosing those measures which appear to him to be most desirable, are usually summed up in one general appellation, and denominated the *natural liberty of mankind*. This natural liberty consists properly in a power of acting as one thinks fit, without any restraint or controul, unless by the law of nature; being a right inherent in us by birth, and one of the gifts of God to man at his creation, when he endued him with the faculty of free-will. But every man, when he enters into society, gives up a part of his natural liberty, as the price of so valuable a purchase; and, in consideration of receiving the advantages of mutual commerce, obliges himself to conform to those laws which the community has thought proper to establish. And this species of legal obedience and conformity is infinitely more desirable than that wild and savage liberty which is sacrificed to obtain it. For no man, that considers a moment, would wish to retain the absolute and untroubled power of doing whatever he pleases: the consequence of which is, that every other man would also have the same power; and then there would be no security to individuals in any of the enjoyments of life.

*Political* therefore, or *civil*, liberty, which is that of a member of society, is no other than natural liberty so far restrained by human laws (and no farther) as is necessary and expedient for the general advantage of the public. Hence we may collect, that the law, which restrains a man from doing mischief to his fellow citizens, though it diminishes the natural, increases the civil liberty of mankind: but every wanton and causeless restraint of the will of the subject, whether practised by a monarch, a nobility, or a popular assembly, is a degree of tyranny. Nay, that even laws themselves, whether made with or without our consent, if they regulate and constrain our conduct in matters of mere indifference, without any good end in view, are laws destructive of liberty: whereas, if any public advantage can arise from observing such precepts, the controul of our private inclinations, in one or two particular points, will conduce to preserve our general freedom in others of more importance; by supporting that state of society, which alone can secure our independence. Thus the statute of king Edward IV. which forbade the fine gentlemen of those times (under the degree of a lord) to wear pikes upon their shoes or boots of more than two inches in length, was a law that favoured of oppression; because, however ridiculous the fashion then in use might appear, the restraining it by pecuniary penalties could serve no purpose of common utility. But the statute of king Charles II. which prescribes a thing seemingly as indifferent, viz. a dress for the dead, who were all ordered to be buried in woollen, is a law consistent with public liberty; for it encourages the staple trade, on which in great measure depends the universal good of the nation. So that laws, when prudently framed, are by no means subversive, but rather introductive of liberty; for (as Mr Locke has well observed) where there is no law there is no freedom. But then, on the other hand, that constitution or frame of government, that system of laws, is alone calculated to maintain civil liberty, which leaves the subject entire master

ster of his own conduct, except in those points wherein the public good requires some direction or restraint.

The idea and practice of this political or civil liberty flourish in their highest vigour in these kingdoms, where it falls little short of perfection, and can only be lost or destroyed by the folly or demerits of its owner; and the legislature, and of course the laws of Britain, being peculiarly adapted to the preservation of this inestimable blessing even in the meanest subject. Very different from the modern constitutions of other states on the continent of Europe, and from the genius of the imperial law; which in general are calculated to vest an arbitrary and despotic power, of controuling the actions of the subject, in the prince, or in a few grandes. And this spirit of liberty is so deeply implanted in our constitution, and rooted even in our very soil, that a slave or a negro, the moment he lands in Britain, falls under the protection of the laws, and so far becomes a freeman; though the master's right to his service may possibly still continue.

The absolute rights of every Briton, (which, taken in a political and extensive sense, are usually called their *liberties*) as they are founded on nature and reason, so they are coeval with our form of government; though subject at times to fluctuate and change, their establishment (excellent as it is) being still human. At some times we have seen them depressed by overbearing and tyrannical princes; at others, so luxuriant as even to tend to anarchy, a worse state than tyranny itself, as any government is better than none at all. But the vigour of our free constitution has always delivered the nation from these embarrassments: and, as soon as the convulsions consequent on the struggle have been over, the balance of our rights and liberties has settled to its proper level; and their fundamental articles have been from time to time asserted in parliament, as often as they were thought to be in danger:

First, by the great charter of liberties, which was obtained, sword in hand, from king John, and afterwards, with some alterations, confirmed in parliament by king Henry III. his son. Which charter contained very few new grants; but, as Sir Edward Coke observes, was for the most part declaratory of the principal grounds of the fundamental laws of England. Afterwards, by the statute called *confirmatio cartarum*, whereby the great charter is directed to be allowed as the common law; all judgments contrary to it are declared void; copies of it are ordered to be sent to all cathedral churches, and read twice a-year to the people; and sentence of excommunication is directed to be as constantly denounced against all those that by word, deed, or counsel, act contrary thereto, or in any degree infringe it. Next by a multitude of subsequent corroborating statutes (Sir Edward Coke reckons 32.) from the first Edward to Henry IV. Then, after a long interval, by the *petition of right*; which was a parliamentary declaration of the liberties of the people, assented to by king Charles I. in the beginning of his reign. Which was closely followed by the still more ample concessions made by that unhappy prince to his parliament, before the fatal rupture between them; and by the many salutary laws, particu-

larly the *habeas corpus* act, passed under Charles II. To these succeeded the *bill of rights*, or declaration delivered by the lords and commons to the prince and princess of Orange 13th February 1688; and afterwards enacted in parliament, when they became king and queen: which declaration concludes in these remarkable words; "and they do claim, demand, and insist upon, all and singular the premises, as their undoubted rights and liberties." And the act of parliament itself recognizes "all and singular the rights and liberties asserted and claimed in the said declaration to be the true, ancient, and indubitable rights of the people of this kingdom." Lastly, these liberties were again asserted at the commencement of the present century, in the *act of settlement*, whereby the crown was limited to his present majesty's illustrious house: and some new provisions were added, at the same fortunate æra, for better securing our religion, laws, and liberties; which the statute declares to be "the birthright of the people of England," according to the ancient doctrine of the common law.

Thus much for the *declaration* of our rights and liberties. The rights themselves, thus defined by these several statutes, consist in a number of private immunities; which will appear, from what has been premised, to be indeed no other, than either that *residuum* of natural liberty, which is not required by the laws of society to be sacrificed to public convenience; or else those civil privileges, which society hath engaged to provide, in lieu of the natural liberties so given up by individuals. These therefore were formerly, either by inheritance or purchase, the rights of all mankind; but, in most other countries of the world, being now more or less debased and destroyed, they at present may be said to remain, in a peculiar and emphatical manner, the rights of the people of Britain. And these may be reduced to three principal or primary articles; the right of personal security, the right of personal liberty, and the right of private property: because, as there is no other known method of compulsion, or of abridging man's natural free-will, but by an infringement or diminution of one or other of these important rights, the preservation of these, inviolate, may justly be said to include the preservation of our civil immunities in their largest and most extensive sense. See the article RIGHTS.

In vain, however, would these rights be declared, ascertained, and protected by the dead letter of the laws, if the constitution had provided no other method to secure their actual enjoyment. It has therefore established certain other auxiliary subordinate rights of the subject, which serve principally as barriers to protect and maintain inviolate the three great and primary rights, of personal security, personal liberty, and private property. These are,

1. The constitution, powers, and privileges of parliament; for which see PARLIAMENT,
2. The limitation of the king's prerogative, by bounds so certain and notorious, that it is impossible he should exceed them without the consent of the people; as to which, see PARLIAMENT. The former of these keeps the legislative power in due check and vigour, so as to make it improbable that laws should be enacted destructive of general liberty: the latter is a guard upon the executive power, by restraining it from

from acting either beyond or in contradiction to the laws that are framed and established by the other.

3. A third subordinate right of every Briton is that of applying to the courts of justice for redress of injuries. Since the law is, in this realm, the supreme arbiter of every man's life, liberty, and property, courts of justice must at all times be open to the subject, and the law be duly administered therein. The emphatical words of *magna carta*, spoken in the person of the king, who in judgment of law (says Sir Edward Coke) is ever present and repeating them in all his courts, are these; *Nulli vendemus, nulli negabimus, aut differemus rectum vel iustitiam*: "and therefore every subject," continues the same learned author, "for injury done to him *in bonis, in terris, vel persona*, by any other subject, be he ecclesiastical or temporal, without any exception, may take his remedy by the course of the law, and have justice and right for the injury done to him, freely without sale, fully without any denial, and speedily without delay." It were endless to enumerate all the *affirmative* acts of parliament, wherein justice is directed to be done according to the law of the land: and what that law is, every subject knows; or may know if he pleases: for it depends not upon the arbitrary will of any judge; but is permanent, fixed, and unchangeable, unless by authority of parliament. We shall however just mention a few *negative* statutes, whereby abuses, perversions, or delays of justice, especially by the prerogative, are restrained. It is ordained by *magna carta*, that no freeman shall be outlawed, that is, put out of the protection and benefit of the laws, but according to the law of the land. By 2 Ed. III. c. 8. and 11 Ric. II. c. 10. it is enacted, that no commands or letters shall be sent under the great seal, or the little seal, the signet, or privy seal, in disturbance of the law; or to disturb or delay common right: and, though such commandments should come, the judges shall not cease to do right: which is also made a part of their oath by statute 18 Ed. III. fl. 4. And by 1 W. & M. fl. 2. c. 2. it is declared, that the pretended power of suspending or dispensing with laws, or the execution of laws, by regal authority without consent of parliament, is illegal.

Not only the substantial part, or judicial decisions, of the law, but also the formal part, or method of proceeding, cannot be altered but by parliament: for, if once those outworks were demolished, there would be an inlet to all manner of innovation in the body of the law itself. The king, it is true, may erect new courts of justice; but then they must proceed according to the old established forms of the common law. For which reason it is declared in the statute 16 Car. I. c. 10. upon the dissolution of the court of privy-chamber, that neither his majesty, nor his privy-council, have any jurisdiction, power, or authority by English bill, petition, articles, libel (which were the course of proceeding in the star-chamber, borrowed from the civil law) or by any other arbitrary way whatsoever, to examine, or draw into question, determine, or dispose of the lands or goods of any subjects of this kingdom; but that the same ought to be tried and determined in the ordinary courts of justice, and by *course of law*.

4. If there should happen any uncommon injury, or

infringement of the rights before-mentioned, which the ordinary course of law is too defective to reach, there still remains a fourth subordinate right, appertaining to every individual, namely, the right of petitioning the king, or either house of parliament, for the redress of grievances. In Russia we are told, that the Czar Peter established a law, that no subject might petition the throne, till he had first petitioned two different ministers of state. In case he obtained justice from neither, he might then present a third petition to the prince; but upon pain of death, if found to be in the wrong. The consequence of which was, that no one dared to offer such third petition; and grievances seldom falling under the notice of the sovereign, he had little opportunity to redress them. The restrictions, for some there are, which are laid upon petitioning in Britain, are of a nature extremely different; and while they promote the spirit of peace, they are no check upon that of liberty. Care only must be taken, lest, under the pretence of petitioning, the subject be guilty of any riot or tumult; as happened in the opening of the memorable parliament in 1640: and, to prevent this, it is provided by the statute 13 Car. II. fl. 1. c. 5. that no petition to the king, or either house of parliament, for any alteration in church or state, shall be signed by above 20 persons, unless the matter thereof be approved by three justices of the peace, or the major part of the grand jury, in the country; and in London, by the lord mayor, aldermen, and common-council: nor shall any petition be presented by more than 10 persons at a time. But, under these regulations, it is declared by the statute 1 W. & M. fl. 2. c. 2. that the subject hath a right to petition; and that all commitments and prosecutions for such petitioning are illegal.

5. The fifth and last auxiliary right of the subject, that we shall at present mention, is that of having arms for their defence, suitable to their condition and degree, and such as are allowed by law. Which is also declared by the same statute 1 W. & M. fl. 2. c. 2. and is indeed a public allowance, under due restrictions, of the natural right of resistance and self-preservation, when the sanctions of society and laws are found insufficient to restrain the violence of oppression.

In these several articles consists the rights, or, as they are frequently termed, the *liberties of Britons*: liberties more generally talked of, than thoroughly understood; and yet highly necessary to be perfectly known and considered by every man of rank or property, lest his ignorance of the points whereon they are founded should hurry him into faction and licentiousness on the one hand, or a pusillanimous indifference and criminal submission on the other. And we have seen that these rights consist, primarily, in the free enjoyment of personal security, of personal liberty, and of private property. So long as these remain inviolate, the subject is perfectly free; for every species of compulsive tyranny and oppression must act in opposition to one or other of these rights, having no other object upon which it can possibly be employed. To preserve these from violation, it is necessary that the constitution of parliaments be supported in its full vigour; and limits, certainly known, be set to the royal prerogative. And, lastly, to vindicate these rights,



Liberty.

when actually violated or attacked, the subjects of Britain are entitled, in the first place, to the regular administration and free course of justice in the courts of law; next, to the right of petitioning the king and parliament for redress of grievances; and lastly, to the right of having and using arms for self-preservation and defence. And all these rights and liberties it is our birthright to enjoy entire; unless where the laws of our country have laid them under necessary restraints. Restraints in themselves so gentle and moderate, as will appear upon farther inquiry, that no man of sense or probity would wish to see them slackened. For all of us have it in our choice to do every thing that a good man would desire to do; and are restrained from nothing, but what would be pernicious either to ourselves or our fellow-citizens. So that this review of our situation may fully justify the observation of a learned French author, who indeed generally both thought and wrote in the spirit of genuine freedom; and who hath not scrupled to profess, even in the very bosom of his native country, that the British is the only nation in the world, where political or civil liberty is the direct end of its constitution. Recommending therefore to the student in our laws a farther and more accurate search into this extensive and important title, we shall close our remarks upon it with the expiring wish of the famous father Paul to his country, "ESTO PERPETUA!"

**LIBERTY and Necessity.** See *METAPHYSICS*, n° 78.—80.

**LIBERTY of the Press.** The art of printing, soon after its introduction, was looked upon in England, as well as in other countries, as merely a matter of state, and subject to the coercion of the crown. It was therefore regulated with us by the king's proclamations, prohibitions, charters of privilege and licence, and finally by the decrees of the court of star-chamber, which limited the number of printers, and of presses which each should employ, and prohibited new publications unless previously approved by proper licensers. On the demolition of this odious jurisdiction in 1641, the long parliament of Charles I. after their rupture with that prince, assumed the same powers as the star-chamber had exercised with respect to the licensing of books: and in 1643, 1647, 1649, and 1652 (Scobell. i. 44, 134. ii. 88, 230.) issued their ordinances for that purpose, founded principally on the star-chamber decree of 1637. In 1662, was passed the statute 13 & 14 Car II. c. 33. which, with some few alterations, was copied from the parliamentary ordinances. This act expired in 1679; but was revived by statute 1 Jac. II. c. 17. and continued till 1692. It was then continued for two years longer by statute 4 W. & M. c. 24. but though frequent attempts were made by the government to revive it, in the subsequent part of that reign (Com. Journ. 11 Feb. 1694. 26 Nov. 1695. 22 Oct. 1696. 9 Feb. 1697. 31 Jan. 1698.) yet the parliament resisted it so strongly, that it finally expired, and the press became properly free in 1694; and has continued so ever since.

The liberty of the press, however, so essential to the nature of a free state, consists not in freedom from censure for any criminal matter that may be published, but in laying no previous restraints upon publications. Every freeman has undoubtedly a right to lay what

sentiments he pleases before the public; to forbid this, is to destroy the freedom of the press: but if he publishes what is improper, mischievous, or illegal, he must take the consequence of his own temerity \*. To subject the press to the restrictive power of a licenser in the manner abovementioned, is to subject all freedom of sentiment to the prejudices of one man, and make him the arbitrary and infallible judge of all controverted points in learning, religion, and government. But to punish (as the law does at present) any dangerous or offensive writings which, when published, shall, on a fair and impartial trial, be adjudged of a pernicious tendency, is necessary for the preservation of peace and good order, of government and religion, the only solid foundations of civil liberty. Thus the will of individuals is still left free; the abuse only of that free-will is the object of legal punishment. Neither is any restraint hereby laid upon freedom of thought or inquiry; liberty of private sentiment is still left; the disseminating or making public of bad sentiments, destructive of the ends of society, is the crime which society corrects. A man (says a fine writer on this subject) may be allowed to keep poisons in his closet, but not publicly to vend them as cordials. And to this we may add, that the only plausible argument heretofore used for restraining the just freedom of the press, "that it was necessary to prevent the daily abuse of it," will entirely lose its force, when it is shewn, (by a seasonable exertion of the laws) that the press cannot be abused to any bad purpose without incurring a suitable punishment: whereas, it can never be used to any good one when under the controul of an inspector. So true will it be found, that to censure the licentiousness, is to maintain the liberty of the press.

**LIBETHRA**, (anc. geog.) the fountain of song, was situated in Magnesia, a district of Macedonia, annexed to Thessaly; distinct from the town of Libethra, which stood on mount of Olympus, where it verges towards Macedonia: hence the Muses are called *Libethridæ*, (Virgil.) Strabo places on Helicon, not only Hippocrene, and the temple of the Muses, but also the cave of the nymphs Libethrides.

**LIBETHRIUS mons**, (anc. geog.) a mountain of Boeotia, distant from Coronea 40 stadia; where stood the statues of the Muses, and of the nymphs, surnamed *Libethrine*. A mountain probably conjoined with, or at least very near to, Helicon.

**LIBITINA**, in Pagan worship, the goddess of funerals, is believed by some to have been the same with Proserpine. She had a temple at Rome, in which every thing proper for funerals was kept; and which were either bought or borrowed of her priests, called *libitinarii*, as every one had occasion.

**LIBNA**, (anc. geog.), a sacerdotal city in the tribe of Judah; a place of strength, as appears from Sennacherib's laying siege to it, 2 Kings xix. Isaiah xxxvii. In Jerome's time, a village, called *Lobna*, in the territory of Eleutheropolis.

**LIBOURNE**, a town of France, in Guienne, and in Bourdelois. It is a populous trading town, and is seated on the river Dordogne. W. Long. c. 10. N. Lat. 44. 55.

**LIBRA**, the BALANCE, in astronomy. See there, n° 206.

Libethra  
||  
Libra.

\* See  
Libet.

LIBRA, in Roman antiquity, a pound weight, also a coin equal in value to 20 denarii.

LIBRARY, an edifice or apartment defined for holding a considerable number of books placed regularly on shelves; or, the books themselves lodged in it.

The first who erected a library at Athens was the tyrant Pisistratus, which was transported by Xerxes into Persia, and afterwards brought back by Seleucus Nicanor to Athens. Plutarch says, that under Eumenes there was a library at Pergamus that contained 200,000 books. That of Ptolemy Philadelphus, according to A. Gellius, contained 700,000, which were all burnt by Cæsar's soldiers. Constantine and his successors erected a magnificent one at Constantinople, which in the eighth century contained 300,000 volumes; and among the rest, one in which the Iliad and Odyssey were written in letters of gold, on the guts of a serpent; but this library was burnt by order of Leo Isaurus. The most celebrated libraries of ancient Rome; were the Ulpian and the Palatine, and in modern Rome, that of the Vatican. The foundation of the Vatican library was laid by pope Nicholas, in the year 1450; it was afterwards destroyed in the sacking of Rome by the constable of Bourbon, and restored by pope Sixtus V. and has been considerably enriched with the ruins of that of Heidelberg, plundered by count Tilly in 1682. One of the most complete libraries in Europe, is that erected by Cosmo de Medicis; though it is now exceeded by that of the French king, which was begun by Francis I. augmented by cardinal Richelieu, and completed by M. Colbert. The emperor's library at Vienna, according to Lambecius, consists of 80,000 volumes, and 15,940 curious medals. The Bodleian library at Oxford exceeds that of any university in Europe, and even those of any of the sovereigns of Europe, except the emperor's and the French king's, which are each of them older by 100 years. It was first opened in 1602, and has since been increased by a great number of benefactors: indeed, the Medicean library, that of Bessarion at Venice, and those just mentioned, exceed it in Greek manuscripts; but it outdoes them all in Oriental manuscripts; and as to printed books, the Ambrosian at Milan, and that at Wolfenbüttele, are two of the most famous, and yet both are inferior to the Bodleian. The Cotton library consists wholly of manuscripts, particularly of such as relate to the history and antiquities of Britain; which, as they are now bound, make about 1000 volumes.

In Edinburgh there is a good library belonging to the university, well furnished with books; which are kept in good order. There is also a noble library of books and manuscripts belonging to the faculty of Advocates. See ADVOCATE.

LIBRATION, in astronomy, an apparent irregularity of the moon's motion, whereby she seems to librate about her axis, sometimes from the east to the west, and now and then from the west to the east. See ASTRONOMY, n° 221.

LIBURNIA (anc. geogr.), a district of Illyricum, extending towards the Adriatic between Istria on the west, Dalmatia on the east, and mount Albius on the north. *Liburni*, the people. The apparitors, who at the command of the magistrate summoned the

people from the country, were called *Liburni*, because generally men of *Liburnia*. *Liburna*, or *Liburnica*, (Horace), denoted a kind of light and swift skiff, used by the Liburnians in their sea-rovings or piracies, for which they were noted. *Liburnum* (Juvenal), a species of litter, made in form of Liburnian skiffs, where-in the noblemen of Rome were carried, and where they sat at their ease, either reading or writing, (Juvenal).

LIBURNUS (Polybius), a mountain of Campania. Also a port of Tuscany. Now *Livorno*, or *Leghorn*. E. Long. 11. N. Lat. 43. 30.

LIBYA, in general, according to the Greeks, denoted Africa. An appellation derived from *Lub*, "thirst," being a dry and thirsty country.

LIBYA, in a more restrained sense, was the middle part of Africa, extending north and west, (Pliny); between the Mediterranean to the north, the Atlantic to the west, the Ethiopic to the south, and Ethiopia to the east; and was two-fold, the *Hither* or *Exterior Libya*; and the *Farther* or *Interior*. The former lay between the Mediterranean on the north, and the *Farther Libya* and Ethiopia beyond Egypt on the south, (Ptolemy). The *Farther* or *Interior Libya*, was a vast country, lying between the *Hither Libya* on the north, the Atlantic ocean on the west, the Ethiopic on the south, and Ethiopia beyond Egypt on the east, (Ptolemy).

LIBYA, in a still more restrained sense, called, for distinction's sake, *Libya Propria*, was a northern district of Africa, and a part of the *Hither Libya*; situated between Egypt to the east, the Mediterranean to the north, the Syrtis Major and the Regio Tripolitana to the west, the Garamantes and Ethiopia beyond Egypt to the south. Now the kingdom and desert of *Barca*. This Libya was again subdivided into *Libya*, taken in the strictest sense of all, and into Marmarica and Cyrenaica. *Libya* in the strictest sense, otherwise the *Exterior*, was the most eastern part of *Libya Propria*, next to Egypt, with Marmarica on the west, the Mediterranean on the north, and the Nubi, now called *Nubia*, to the south, (Ptolemy).

LICE. See PEDICULUS.

Crab-LICE, so called from their resemblance to crab-fish. They infest the arm-pits, eye-lids, eye-brows, and pudenda of grown persons. They are flatfish, and stick so close to the skin, that they can scarce be removed. They are also called *platule*, *petole*, *peffolata*, and, from their often infesting the pubes, they are called *pediculi inguinales*. They are destroyed either with black soap, mercurial ointments, oil of lavender, or a solution of sublimate in rose-water; of which last the proportion may be one drachm of sublimate to a pound of the water.

LICENCE, in law, an authority given to a person to do some lawful act.

LICENSER of the *Presb.* See LIBERTY of the *Presb.*

LICENTIATE, one who has obtained the degree of a licence.—The greatest number of the officers of justice in Spain are distinguished by no other title than that of *licentiate*. In order to pass *licentiate* in common law, civil law, and physic, they must have studied seven years, and in divinity 10. Among us a *licentiate* usually means a physician who has a licence to practise, granted by the college of physicians.

**LICHEN, LIVER WORT;** a genus of the order of algae, belonging to the cryptogamia class of plants. There are upwards of 100 species, all natives of Britain. The most remarkable are,

1. The *geographicus*; it is frequent in rocks, and may be readily distinguished at a distance. The crust or ground is of a bright greenish-yellow colour, sprinkled over with numerous plain black tubercles; which frequently run into one another, and form lines resembling the rivers in a map, from which last circumstance it takes its name.

2. The *calcareous*, or black-nobbed dyer's lichen, is frequent on calcareous rocks; and hath a hard, smooth, white, stoney, or tartareous crust, cracked or tessellated on the surface, with black tubercles. Dillenius relates, that this species is used in dyeing, in the same manner as the *tartareus* after-mentioned.

3. The *ventosus*, or red spangled tartareous lichen, hath a hard tartareous crust, cracked and tessellated on the surface, of a pale-yellow colour when fresh, and a light olive when dry. The tubercles are of a blood-red colour at top, their margin and base of the same colour as the crust. The texture and appearance of this, (according to Mr Lightfoot) indicate that it would answer the purposes of dyeing as well as some others of this tribe, if proper experiments were made.

4. The *candelarius*, or yellow farinaceous lichen, is common upon walls, rocks, boards, and old pales. There are two varieties. The first has a farinaceous crust, of no regular figure, covered with numerous, small, greenish-yellow, or olive shields, and grows commonly upon old boards. The other has a smooth, hard, circular crust, wrinkled and lobed at the circumference, which adheres closely to rocks and stones. In the centre are numerous shields of a deeper yellow or orange colour, which, as they grow old, swell in the middle, and assume the figure of tubercles. The inhabitants of Smaland in Sweden scrape this lichen from the rocks, and mix it with their tallow, to make golden candles to burn on festival days.

5. The *tartareus*, or large yellow-faucer'd dyer's lichen, is frequent on rocks, both in the Highlands and Lowlands of Scotland. The crust is thick and tough, either white, or greenish-white, and has a rough warted surface. The shields are yellow or buff-coloured, of various sizes, from that of a pin's head to the diameter of a silver penny. Their margins are of the same colour as the crust. This lichen is much used by the Highlanders for dyeing a fine claret or pompadour colour. For this purpose, after scraping it from the rocks, and cleaning it, they steep it in urine for a quarter of a year. Then taking it out, they make it into cakes, and hang them up in bags to dry. These cakes are afterwards pulverised, and the powder is used to impart the colour with an addition of alum.

6. The *parellus*, or crawfish-eye lichen, grows upon wall and rocks, but is not very common. The crusts spread closely upon the place where they grow, and cover them to a considerable extent. They are rough, tartareous, and ash-coloured, of a tough coriaceous substance. The shields are numerous and crowded, having white or ash-coloured, shallow, plain discs, with obtuse margins. This is used by the French for

dyeing a red colour.

7. The *fixatiles*, or grey-blue pitted lichen, is very common upon trunks of trees, rocks, tiles, and old wood. It forms a circle two or three inches diameter. The upper surface is of a blue-grey and sometimes of a whitish ash-colour, uneven, and full of numerous small pits or cavities; the under-side is black, and covered all over, even to the edges, with short simple hairs or radicles. A variety sometimes occurs with leaves tinged of a red or purple colour. This is used by finches and other small birds in constructing the outside of their curiously formed nests.

8. The *omphalodes*, or dark-coloured dyers lichen, is frequent upon rocks. It forms a thick widely expanded crust of no regular figure, composed of numerous imbricated leaves of a brown or dark-purple colour, divided into small segments. The margins of the shields are a little crisped and turned inwards, and their outside ash-coloured. This lichen is much used by the Highlanders in dyeing a reddish brown colour. They steep it in urine for a considerable time, till it becomes soft and like a paste; then, forming the paste into cakes, they dry them in the sun, and preserve them for use in the manner already related of the *Tartareus*.

9. The *parietinus*, or common yellow wall-lichen, is very common upon walls, rocks, tiles of houses, and trunks of trees. It generally spreads itself in circles of two or three inches diameter, and is said to dye a good yellow or orange colour with alum.

10. The *islandicus*, or eatable Iceland lichen, grows on many mountains both of the Highlands and Lowlands of Scotland. It consists of nearly erect leaves about two inches high, of a stiff substance when dry, but soft and pliant when moist, variously divided without order into broad distant segments, bifid or trifid at the extremities. The upper or interior surface of the leaves is concave, chestnut-colour, smooth, and shining, but red at the base; the under or exterior surface is smooth and whitish, a little pitted, and sprinkled with very minute black warts. The margins of the leaves and all the segments from bottom to top are ciliated with small, short, stiff, hair-like spinules, of a dark chestnut colour, turning towards the upper side. The shields are very rarely produced. For the uses of this as an esculent herb, see *ICELAND* p. 16. Made into broth or gruel, it is said to be very serviceable in coughs and consumptions; and, according to Haller and Scopoli, is much used in these complaints in Vienna.

11. The *pulmonarius*, or lungwort lichen, grows in shady woods upon the trunks of old trees. The leaves are as broad as a man's hand, of a kind of leather-like substance, hanging loose from the trunk on which it grows, and lacinated into wide angular segments. Their natural colour, when fresh, is green; but in drying, they turn first to a glaucous and afterwards to a fuscous colour. It has an astringent, better taste; and, according to Gmelin, is boiled in ale in Siberia, instead of hops. The ancients used it in coughs and asthma, &c. but it is not used in modern practice.

12. The *calcaris*, or beaked lichen, grows sometimes upon trees but more frequently upon rocks, especially on the sea-coasts, but is not very common. It is smooth, glossy, and whitish, producing flat or convex shields



shields, of the same colour as the leaves, very near the summits of the segments, which are acute and rigid, and, being often reflected from the perpendicular by the growth of the shields, appear from under their limbs like a hooked beak. This will dye a red colour; and promises, in that intention, to rival the famous *Lichen Rocella* or *Argol*, which is brought from Canary Islands, and sometimes sold at the price of 80l. per ton. It was formerly used instead of starch to make hair-powder.

13. The prunastri, or common ragged hoary lichen, grows upon all sorts of trees; but is generally molt white and hoary on the sloe and old plum trees or upon old pales. This is the most variable of the whole tribe of lichens, appearing different in figure, magnitude and colour, according to its age, place of growth, and sex. The young plants are of a glaucous colour, slightly divided into small acute crested segments. As they grow older, they are divided like a stag's horn, into more and deeper segments, somewhat broad, flat, fosi, and pitted on both sides, the upper surface of a glaucous colour, the under one white and hoary.—The male plants, as Linnæus terms them, are short, seldom more than an inch high, not hoary on the under-side; and have pale glaucous shields situated at the extremities of the segments, standing on short peduncles, which are only small stiff portions of the leaf produced.—The female specimens have numerous farinaceous tubercles both on the edges of their leaves, and the wrinkles of their surface.—The pulverized leaves have been used as a powder for the hair, and also in dying yarn of a red-colour.

14. The juniperinus, or common yellow tree-lichen, is common upon the trunks and branches of elms and many other trees. Linnæus says it is very common upon the juniper. The Gothland Swedes dye their yarn of a yellow colour with it, and give it as a specific in the jaundice.

15. The caninus, or ash-coloured ground-liverwort, grows upon the ground among moss, at the roots of trees in shady woods, and is frequent also in heaths and stony places. The leaves are large, gradually dilated towards the extremities, and divided into roundish elevated lobes. Their upper side, in dry weather, is ash-coloured; in rainy weather, of a dull fuscous green colour; their under-side white and hoary, having many thick downy nerves from which descend numerous, long, white, pencil-like radicles. The peltæ, or shields, grow at the extremities of the elevated lobes, shaped like the human nail; of a roundish oval form, convex above, and concave beneath; of a chocolate colour on the upper side, and the same colour with the leaves on the under. There are two varieties, the one called *reddish*, and the other *many-fingered* ground-liverwort. The former is more common than the other. This species has been rendered famous by the celebrated Dr Mead, who asserted that it was an infallible preventative of the dreadful consequences attending the bite of a mad dog. He directed half an ounce of the leaves dried and pulverized to be mixed with two drachms of powdered black pepper. This was to be divided into four doses, one of which was to be taken by the patient every morning fasting, for four mornings successively, in half a pint of warm cow's milk; after which he was to

use the cold bath every morning for a month.—It is much to be lamented, however, that the success of this medicine, or indeed any other recommended for the same purpose, hath not always answered the expectation. There are instances where the application hath not prevented the hydrophobia, and it is even uncertain whether it has ever been instrumental in keeping off that disorder.

16. The aphthosus, or green ground-liverwort with black warts, grows upon the ground at the roots of trees in woods, and other stony and mossy places. It differs very little from the foregoing, and according to some is only a variety of it. Linnæus informs us, that the country-people of Upland in Sweden give an infusion of this lichen in milk to children that are troubled with the disorder called the *thrush* or *aphthæ*, which induced that ingenious naturalist to bestow upon it the trivial name of *aphthosus*. The same writer also tells us, that a decoction of it in water purges upwards and downwards, and will destroy worms.

17. The cocciferus, or scarlet-tipped cup-lichen, is frequent in moors and heaths. It has in the first state a granulated crust for its ground, which is afterwards turned into small lacinated leaves, green above, and hoary underneath. The plant assumes a very different aspect, according to the age, situation, and other accidents of its growth; but may be in general readily distinguished by its fructifications, which are fungous tubercles of a fine scarlet colour, placed on the rim of the cup, or on the top of the stalk. These tubercles, steeped in an alkaline lixivium, are said to dye a fine durable blue colour.

18. The rangiferinus, or rein-deer lichen, is frequent in woods, heaths, and mountainous places. Its general height, when full-grown, is about two inches. The stalk is hollow, and very much branched from bottom to top; the branches are divided and subdivided, and at last terminated by two, three, four, or five very fine, short, nodding horns. The axillæ of the branches are often perforated. The whole plant is of a hoary white or grey colour, covered with white farinaceous particles, light and brittle when dry, soft and elastic when moist. The fructifications are very minute, round, fuscous, or reddish-brown tubercles, which grow on the very extremities of the finest branches; but these tubercles are very seldom found. The plant seems to have no foliaceous ground for the base, nor scarcely any visible roots.—Linnæus tells us, that in Lapland this moss grows so luxuriant that it is sometimes found a foot high. There are many varieties of this species, of which the principal is the sylvaticus, or brown-tipt rein-deer lichen. The most remarkable difference between them is, that the sylvaticus turns fuscous by age, while the other always continues white. For the uses of these species, see LAPLAND.

19. The picatus, or official stringy lichen, grows on the branches of old trees, but is not very common. The stalks are a foot or more in length, cylindrical, rigid, and string-shaped, very irregularly branched, the branches entangled together, of a cinereous or ash-colour, brittle and stringy if doubled short, otherwise tough and pliant, and hang pendent from the trees on which they grow. The shields grow gene-  
rally

Lichten-  
berg  
Lichnius.

rally at the extremities of the branches, are nearly flat, or slightly concave, thin, ash-coloured above, pale-brown underneath, and radiated with fine rigid fibres. As the plant grows old, the branches become covered with a white, rough, warty crust; but the young ones are delitute of it. It was formerly used in the shops as an astringent to stop hæmorrhages, and to cure ruptures; but is out of the modern practice. Linneus informs us, that the Laplanders apply it to their feet to relieve the excoriations occasioned by much walking.

20. The *barbatus*, or bearded lichen, grows upon the branches of old trees in thick woods and pine-forests. The stalks or strings are slightly branched and pendulous, from half a foot to two feet in length, little bigger than a taylor's common sewing thread; cylindrically jointed towards the base; but surrounded every where else with numerous, horizontal, capillary fibres, either simple, or slightly branched. Their colour is a whitish green. This has an astringent quality like the preceding. When steeped in water, it acquires an orange colour; and, according to Dillenius, is used in Pennsylvania for dying that colour.

21. The *vulpinus*, or gold-wiry lichen, grows upon the trunks of old trees, but is not very common. It is produced in erect tufts, from half an inch to two inches in height, of a fine yellow or lemon colour, which readily discovers it. The filaments which compose it are not cylindrical, but a little compressed and uneven on the surface, variously branched, the angles obtuse, and the branches straggling and entangled one with another. Linneus informs us, that the inhabitants of Smaland in Sweden dye their yarn of a yellow colour with this lichen; and that the Norwegians destroy wolves by stuffing dead carcasses with this moss reduced to powder, and mixed with pounded glass, and so exposing them in the winter-season to be devoured by those animals.

**LICHTENBERG**, a castle of France, in Lower Alsace, and the chief place of a county of the same name; seated on a rock, near the mountains Vosges, and is looked upon as impregnable. E. Long. 7. 35. N. Lat. 48. 55.

**LICHTENBURG**, a town of Germany, in the circle of Franconia, and margravate of Culmbach. E. Long. 12. o. N. Lat. 50. 26.

**LICHTENFELS**, a town of Germany, in the circle of Franconia, and bishoprick of Bamberg, seated on the river Mayne, in E. Long. 11. 10. N. Lat. 50. 20.

**LICHTENSTEIN**, a town of Switzerland, in Tockenberg, seated on the river Thour. E. Long. 2. 15. N. Lat. 47. 25.

**LICHTSTALL**, an handsome town of Switzerland, in the county of Basle; seated on the river Elgetz. in E. Long. 7. 57. N. Lat. 47. 40.

**LICINIUS STOLO**, a famous Roman tribune, styled *Stolo* on account of a law he made, while tribune, that no Roman citizen should possess more than 500 acres of land; alleging, that when they occupied more, they could not cultivate it with care, nor pull up the useless shoots (*stolones*) that grow from the roots of trees. He is memorable also for enacting, that one of the consuls should always be of a Plebeian family. He lived about 362 B. C.

**LICOLA**, or **LAGO-DI-LICOLA**, a lake in the kingdom of Naples, formerly famous for plenty of excellent fish; but in the year 1538 an explosion of a volcano changed one part of it into a mountain of ashes, and the other into a morass. It was anciently known by the name of the Lucrine-lake.

**LICTORS**, in Roman antiquity, twelve officers or sergeants, appointed by Romulus the founder of Rome, to attend him whenever he should appear in public; each of them bearing a battle-ax stuck in a bundle of rods, which was then the usual symbol of sovereignty in the petty states of Hetruria. It was also a part of their office to be the public executioners in beheading, scourging, &c.

**LIDD**, a town of Kent in England, seated in Runney-marsh, and is one of the Cinque-ports. On the east side of it is a heap of stones, which they pretend was the tomb of Crispin and Crispianus.

**LIDKOPING** a town of West Gothland in Sweden, seated on the lake Wenar, in E. Long. 13. 40. N. Lat. 58. 25.

**LIECHTENAU**, a town of Germany, in the circle of Franconia and Margravate of Anspach, subject to Nuremberg. E. Long. 9. 5. N. Lat. 48. 43.

**LIEGE**, (*Ligeur*), in law, is used for *liege-lord*, and sometimes for *liege-man*: *liege-lord* is he that acknowledgeth no superior, and *liege-man* is he who owneth allegiance to his *liege-lord*, 34 & 35 H. VIII. The king's subjects are called *lieges* or *liege-people*, because they owe and are bound to pay allegiance to him. Stat. 8. H. VI. c. 10, 14. H. VIII. c. 2. But in ancient times, private persons, as lords of manors, &c. had their lieges. Skene says that this word is derived from the Italian *Liga*, a bond or league.

**LIEGE-Possitie**, in Scots law, is opposed to death-bed; and signifies a person's enjoying that state of health in which only he can dispose of his property at pleasure.

**LIEGE**, a bishopric of Germany, in the circle of Westphalia; bounded to the north by Brabant, to the south by Champagne and Luxemburg, to the east by Limburg and Juliers, and to the west by Brabant, Namur, and Hainault. It is very unequal both in length and breadth; the former being in some places above 90 miles, in others not half so much; and the latter in some places 45, in others hardly 25. The air here is very temperate; and the soil fruitful in corn, wine, wood, and pasture. Here also are mines of lead and iron, pits of coal, quarries of marble and stone, and some celebrated mineral waters, as those of Spa and Chau-fontaine. The principal rivers are, the Maes and Sambre. The manufactures and commodities of the country, are chiefly beer, arms, nails, serge, leather, with the products we have just mentioned. The states of the bishopric are composed of three bodies: the first is the chapter of Liege; the second, the nobility of the country; and the third, the deputies of the capital and the other towns. The three estates are seldom called together, except to raise taxes for the service of the province, or upon some particular emergency; but there is a committee of the states, who meet thrice a-week, and in time of war daily. They are always about the prince-bishop, to make remonstrances, and demand the redress of grievances. The bishop is spiritual and temporal lord

Licel.  
Liege.

of the whole country; but, as bishop, is suffragan to the archbishop of Cologne. He styles himself by the *grace of God, bishop and prince of Liege, duke of Bouillon, marquis of Franchimont, count of Loos, Hoorn, &c.* His arms for Liege, are, a pillar argent, on a pedestal of the same, with a crown or, in a field ruby. In the matricula he was formerly rated at 50 horse, and 170 foot; or 1280 florins monthly, in lieu of them, but now only at 826. An abatement of one third has also been granted of the ancient assessment to the chamber-court, which was 360 six-dollars 62½ kruitzers for each term. Here are several colleges which sit at Liege, for the government of the country, and the decision of causes, civil, criminal, spiritual and feudal, and of such also as relate to the finances. The chapter consists of 60 persons, who must either prove their nobility for four generations, both by father and mother, before they can be admitted; or if they cannot do that, must at least have been doctors or licentiates of divinity for seven years, or of law, for five years, in some famous university. The bishopric is very populous and extensive, containing 1500 parishes, in which are 24 walled towns, besides others, 52 baronies, besides counties and feignories, 17 abbeys for men, who must be all gentlemen, and 11 for ladies, exclusive of others.

LIEGE, the capital of the bishopric of the same name, stands upon the Maes, in a fine valley, surrounded with woods and hills, being a free imperial city, and one of the largest and most eminent in Europe. Though it is 100 miles from the sea by water, the Maes is navigable up to it. The city has 16 gates; 17 bridges, some of them very handsome; 154 streets, many of them straight and broad; a fine episcopal palace; a very large stately cathedral, in which, besides five great silver coffers full of reliques, are several silver statues of saints, and a St George on horseback of massy gold, presented to the cathedral by Charles the Bold, by way of atonement for using the inhabitants cruelly in the year 1468. Of the other churches, that of St Paul is the most remarkable, both for its structure and fine ornaments in painting and marble. The city is well fortified, and there are also two castles on the mountain of the Holy Wallburg for its defence. Besides a great number of other convents of both sexes, here is a college of English Jesuits, founded in the year 1616, and a fine nunnery of English ladies. Indeed, churches, convents, and other religious foundations, take up the greater part of it. The reader, therefore, no doubt, will take it for granted, that it is a most blessed, holy, and happy city. But however it may fare with the profane, unhallowed laity, it is certainly the paradise of priests, as it is expressly called, by way of eminence. It is divided into the old and new, or the upper and lower; and the latter again into the island, and the quarter beyond the Maes. The houses are high, and built of bluish marble. In the town and suburbs are 12 public places or squares, 10 hospitals, a beguin-house, and two fine keys, planted with several rows of trees, for the burghers to take the air; but a great part of that within the walls is taken up with orchards and vineyards. The manufactures of this city are arms, nails, leather, serge, and beer. In St William's convent, without the city, is the tomb of the famous

English traveller Sir John Mandeville, with an inscription in barbarous French, requesting those who read it to pray for his soul. Near it are kept the saddle, spurs, and knife, that he made use of in his travels. After having seen most of the cities of any note in the world, he made choice of this to spend the eve of his life in. A little way from the city, on the other side the Maes, stands the episcopal palace of Seraing, in which the bishops generally reside during the summer. The latitude of this city is 50° 36'. and the longitude 5° 40'.

LIENTÉRY, a flux of the belly, in which the aliments are discharged as they are swallowed, or very little altered either in colour or substance. See (*Index subjoined*) MEDICINE.

LIEUTENANT, an officer who supplies the place and discharges the office of a superior in his absence. Of these, some are civil, as the lords lieutenants of kingdoms, and the lords-lieutenants of counties; and others are military, as the lieutenant-general, lieutenant-colonel, &c.

Lord LIEUTENANT of Ireland, is properly a viceroy; and has all the state and grandeur of a king of England, except being served upon the knee. He has the power of making war and peace, of bestowing all the offices under the government, of dubbing knights, and of pardoning all crimes except high treason; he also calls and prorogues the parliament, but no bill can pass without the royal assent. He is assisted in his government by a privy-council; and, on his leaving the kingdom, he appoints the lords of the regency, who govern in his absence.

Lord LIEUTENANTS of Counties, are officers, who, upon any invasion or rebellion, have power to raise the militia, and to give commissions to colonels and other officers, to arm and form them into regiments, troops, and companies. Under the lords-lieutenants, are deputy-lieutenants, who have the same power; these are chosen by the lords-lieutenants, out of the principal gentlemen of each county, and presented to the king for his approbation.

LIEUTENANT-Colonel. See COLONEL.

LIEUTENANT-General. See GENERAL.

LIEUTENANT, in the land-service, is the second commissioned officer in every company of both foot and horse, and next to the captain, and who takes the command upon the death or absence of the captain.

LIEUTENANT of Artillery. Each company of artillery hath four; 1 first and 3 second lieutenants. The first lieutenant has the same detail of duty with the captain; because in his absence he commands the company: he is to see that the soldiers are clean and neat; that their clothes, arms, and accoutrements, are in good and serviceable order; and to watch over every thing else which may contribute to their health. He must give attention to their being taught the exercise, see them punctually paid, their messes regularly kept, and to visit them in the hospitals when sick. He must assist at all parades, &c. He ought to understand the doctrine of projectiles and the science of artillery, with the various effects of gun-powder, however managed or directed; to enable him to construct and dispose his batteries to the best advantage; to plant his cannon, mortars, and howitzers, so as to produce the greatest annoyance to an enemy. He is to be well

Skilled

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Lieutenant.



Lieutenant, skilled in the attack and defence of fortified places; and to be conversant in arithmetic, mathematics, mechanics, &c.

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Ligerius.

*Second Lieutenant in the Artillery*, is the same as an ensign in an infantry regiment, being the youngest commissioned officer in the company, and must assist the first lieutenant in the detail of the company's duty. His other qualifications should be equal with those of the first lieutenant.

*LIEUTENANT of a Ship of War*, the officer next in rank and power to the captain, in whose absence he is accordingly charged with the command of the ship, as also the execution of whatever orders he may have received from the commander relating to the king's service.

The lieutenant who commands the watch at sea, keeps a list of all the officers and men thereto belonging, in order to muster them when he judges it expedient, and report to the captain the names of those who are absent from their duty. During the night-watch, he occasionally visits the lower decks, or sends thither a careful officer, to see that the proper centinels are at their duty, and that there is no disorder amongst the men; no tobacco smoked between decks, nor any fire or candles burning there, except the lights which are in lanterns, under the care of a proper watch, on particular occasions. He is expected to be always upon deck in his watch, as well to give the necessary orders with regard to trimming the sails and superintending the navigation, as to prevent any noise or confusion; but he is never to change the ship's course without the captain's directions, unless to avoid an immediate danger.

The lieutenant, in time of battle, is particularly to see that all the men are present at their quarters, where they have been previously stationed according to the regulations made by the captain. He orders and exhorts them every where to perform their duty; and acquaints the captain at all other times of the misbehaviour of any person in the ship, and of whatever else concerns the service or discipline.

The youngest lieutenant in the ship, who is also styled *lieutenant at arms*, besides his common duty, is particularly ordered, by his instructions, to train the seamen to the use of small arms, and frequently to exercise and discipline them therein. Accordingly his office in time of battle, is chiefly to direct and attend them; and at all other times to have a due regard to the preservation of the small arms, that they be not lost or embezzled, and that they are kept clean and in good condition for service.

*LIEUTENANT Reformed*, he whose company or troop is broke or disbanded, but continued in whole or half-pay, and still preserves his right of seniority and rank in the army.

*LIFE*, is peculiarly used to denote the animated state of living creatures, or the time that the union of their soul and body lasts.

*LIFE-Rent*, in Scots law. When the use and enjoyment of a subject is given to a person during his life, it is said to belong to him in life-rent.

*LIGAMENT*, in anatomy, a strong compact substance, serving to join two bones together.

*LIGARIUS* (Quintus), a Roman proconsul in

Africa, 49 B.C. Taking part with Pompey, he was forbid by Julius Cæsar to return to Rome: to obtain his pardon, Cicero made that admired oration in his defence which has immortalized the memory of the client with that of his celebrated advocate.

*LIGATURE*, in surgery, is a cord, band, or string; or the binding any part of the body with a cord, band, fillet, &c. whether of leather, linen, or any other matter.

Ligatures are used to extend or replace bones that are broken or dislocated; to tie the patients down in lithotomy and amputations; to tie upon the veins in phlebotomy, or the arteries in amputations, or in large wounds; to secure the splints that are applied to fractures; to tie up the processes of the peritonæum with the spermatic vessels in castration; and lastly, in taking off warts or other excrescences by ligature.

*LIGHT*, in the most common acceptation of the word, signifies that invisible ethereal matter which makes objects perceptible to our sense of seeing. Figuratively, it is also used for whatever conveys instruction to our minds, and likewise for that instruction itself.

The nature of light hath been a subject of speculation from the earliest ages of philosophy. Some of the first philosophers distinguished by the appellation of philosophers concerning light, even doubted whether objects became visible by means of any thing proceeding from them, or from the eye of the spectator. The fallacy of this notion must very soon have been apparent, because, in that case, we ought to have seen as well in the night as in the day. The opinion was therefore qualified by Empedocles and Plato; who maintained, that vision was occasioned by particles continually flying off from the surfaces of bodies which met with others proceeding from the eye; but Pythagoras ascribed it solely to the particles proceeding from the external objects and entering the pupil of the eye.

Among the modern philosophers there have been two celebrated opinions, viz. the Cartesian and Newtonian. According to the former, light is an invisible fluid present at all times and in all places, but which requires to be set in motion by an ignited or otherwise properly qualified body in order to make objects visible to us.—The Newtonians maintain, that light is not a fluid *per se*, but consists of a vast number of exceedingly small particles (shaken off in all directions from the luminous body with inconceivable velocity by a repulsive power; and which most probably never return again to the body from which they were emitted. These particles are also said to be emitted in right lines by the body from whence they proceed: and this rectilinear direction they preserve until they are turned out of their original path by the attraction of some other body near which they pass, and which is called *inflection*; by passing through a medium of different density, which is called *refraction*; or by being thrown obliquely or directly forward by some body which opposes their passage, and which is called *reflection*; or, lastly, till they are totally stopped by the substance of any body into which they penetrate, and which is called their *extinction*. A succession of these particles following one another in an exactly straight line is called a *ray of light*; and this ray, in whatever manner it hath its direction changed, whether by refraction, reflection, or inflection, always preserves its recti-

Ligature.  
Light.

Opinions  
of the first  
philosophers  
concerning  
light.

Opinion  
of Des  
Cartes.

Of Sir  
Isaac New-  
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Light.

rectilinear course, neither is it possible by any art whatever to make it pass on in the segment of a circle, ellipse, or other curve.—From some observations on the eclipses of Jupiter's satellites, and also on the aberration of the fixed stars, it appears that the particles of light move at the rate of little less than 200,000 miles in a second of time. See ASTRONOMY, n° 126, 127, 284.

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To this doctrine concerning the nature of light several objections have been made; the most considerable of which is, That in this case, as rays of light are continually passing in different directions from every visible point, they must necessarily interfere with and destroy each other in such a manner as entirely to confound all distinct perception of objects, if not to destroy the sense of seeing altogether; not to mention the continual waste of substance which a constant emission of particles must occasion in the luminous body, and which hence the creation ought to have greatly diminished the sun and stars, as well as increased the bulk of the earth and planets by the vast quantity of particles of light absorbed by them in such a long period of time.

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In answer to this objection, Mr Melville gives some ingenious illustrations concerning the extreme subtilty of light, or the smallness of the particles of which it consists, and of which few persons, even of those who admit the hypothesis, have any idea. He observes, that there is probably no physical point in the visible horizon that does not send rays to every other point, unless where opaque bodies interpose. Light, in its passage from one system to another, often passes thro' torrents of light issuing from other suns and systems, without ever interfering or being diverted in its course, either by it, or by the particles of that elastic medium which some phenomena give us reason to suppose are diffused through all the mundane space. To account for this fact and others similar to it, he concludes, that the particles of which light consists must be incomparably rare, even when they are the most dense; that is, that the semidiameters of the two nearest particles, in the same or in different beams, soon after their emission, are incomparably less than their distance from one another. This difficulty concerning the non-interference of the particles of light is not solved, as he observes, by supposing with Mr Boscovich and others, that each particle is endued with an insuperable impulsive force; because, in that case, their spheres of impulsion would even be more liable to interfere, and they would on that account be more likely to disturb one another.

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anton.

The difficulty, according to Mr Canton, will nearly vanish, if a very small portion of time be allowed between the emission of every particle and the next that follows in the same direction. Suppose, for instance, that one lucid point of the sun's surface emits 150 particles in a second, which are more than sufficient to give continual light to the eye without the least appearance of intermission; yet still the particles of which it consists, will on account of their great velocity be more than 1000 miles behind each other, and thereby leave room enough for others to pass in all directions.

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In order to determine whether light really consisted of particles emitted from the luminous body, or only in the vibrations of a subtle fluid, it hath been attempted to find out its momentum, or the force with which it

moves. The first who set about this matter with any tolerable pretensions to accuracy was M. Mairan. Others indeed, particularly Hartlocker and Homberg, had pretended, that in certain cases this momentum was very perceptible; but M. Mairan proved, that the effects mentioned by them were owing to currents of heated air produced by the burning-glasses used in their experiments, or to some other causes overlooked by the philosophers. To decide the matter therefore, if possible, he began with trying the effects of rays collected by lenses of four and six inches diameter, and thrown upon the needle of a compass; but the result was nothing more than some tremulous motion from whence he could draw no conclusion. After this, he and Mr du Fay constructed a kind of mill of copper, which moved with an exceeding slight impulse; but though they threw upon it the focus of a lens of seven or eight inches diameter, they were still unable to draw any conclusions from the result.

Light.

8  
By Mr  
Mairan,

M. Mairan afterwards procured a horizontal wheel of iron three inches in diameter, having six radii, at the extremity of each of which was a small wing fixed obliquely. The axis of the wheel, which was also of iron, was suspended by a magnet. The wheel and the axis together did not weigh more than 30 grains; but though a motion was given to this wheel when the focus of the burning-glass was thrown upon the extremities of the radii, yet it was so irregular that he could not but conclude that it was occasioned by the motion of the heated air. He then intended to have made his experiment *in vacuo*, but he concluded that it was unnecessary. For, besides the difficulty of making a vacuum, he was persuaded that there was in our atmosphere a thinner medium which freely penetrates even glass itself, the existence of which he imagined that he had sufficiently proved in his treatise on the aurora borealis. See AURORA BOREALIS, n° 5.

9  
By Mr  
Michell.

Mr Michell some years ago endeavoured to ascertain the momentum of light in a manner still more accurate. The instrument he made use of for this purpose consisted of a very thin plate of copper, a little more than an inch square, which was fastened to one end of a slender harpichord-wire about ten inches long. To the middle of this was fixed an agate cap, such as is commonly used for small mariner's compasses, after the manner of which it was intended to turn; and at the other end of the wire was a middling sized shot-corn, as a counterpoise to the copper-plate. The instrument had also fixed to it in the middle, at right angles to the length of the wire, and in an horizontal direction, a small bit of a very slender sewing needle, about one third, or perhaps half an inch long, which was made magnetical. In this state the whole instrument might weigh about 10 grains. It was placed on a very sharp pointed needle, on which the agate cap turned extremely freely; and to prevent its being disturbed by any motion of the air, it was included in a box, the lid and front of which were of glass. This box was about 12 inches long, six or seven inches deep, and about as much in width; the needle standing upright in the middle. At the time of making the experiment, the box was placed in such a manner that a line drawn from the sun passed at right angles to the length of it; and the instrument was brought to range in the same direction with the box, by means of the mag-

Light.

magnetical bit of needle abovementioned, and a magnet properly placed on the outside, which would retain it, though with extremely little force, in any situation. The rays of the sun were now thrown upon the copperplate abovementioned from a concave mirror of about two feet diameter, which, passing through the front-glass of the box, were collected into the focus of the mirror upon the copperplate. In consequence of this the plate began to move, with a slow motion of about an inch in a second of time, till it had moved through a space of about two inches and a half, when it struck against the back of the box. The mirror being removed, the instrument returned to its former situation by means of the little needle and magnet; and the rays of the sun being then again thrown upon it, it again began to move, and struck against the back of the box as before; and this was repeated three or four times with the same success.—The instrument was then placed the contrary way in the box to that in which it had been placed before, so that the end to which the copper-plate was affixed, and which had lain, in the former experiment, towards the right hand, now lay towards the left; and the rays of the sun being again thrown upon it, it began to move with a slow motion, and struck against the back of the box as before; and this was repeated once or twice with the same success. But by this time the copperplate began to be so much altered in its form, by the extreme heat which it underwent in each experiment, and which brought it nearly into a state of fusion, that it became very much bent, and the more so as it had been unwarily supported by the middle, half of it lying above and half below the wire to which it was fastened. By this means it now varied so much from the vertical position, that it began to act in the same manner as the sail of a windmill, being impelled by the stream of heated air which moved upwards, with a force sufficient to drive it in opposition to the impulse of the rays of light.

Dr Priestley's conclusions.

“If we impute, (says Dr Priestley), the motion produced in the above experiment to the impulse of the rays of light, and suppose that the instrument weighed ten grains, and acquired a velocity of one inch in a second, we shall find that the quantity of matter contained in the rays falling upon the instrument in that time amounted to no more than one twelve hundred millionth part of a grain, the velocity of light exceeding the velocity of one inch in a second in the proportion of about 12,000,000,000 to 1. Now the light in the above experiment was collected from a surface of about three square feet, which reflecting only about half what falls upon it, the quantity of matter contained in the rays of the sun incident upon a square foot and an half of surface in one second of time, ought to be no more than the twelve hundred millionth part of a grain, or, upon one square foot only, the eighteen hundred millionth part of a grain. But the density of the rays of light at the surface of the sun is greater than at the earth in the proportion of 45,000 to 1: there ought, therefore, to issue from one square foot of the sun's surface in one second of time, in order to supply the waste by light, one forty thousandth part of a grain of matter; that is, a little more than two grains in a day, or about 4,752,000 grains, or 670 pounds avoirdupois nearly, in 6000 years; a quantity

which would have shortened the sun's semidiameter no more than about ten feet, if it was formed of the density of water only.”

The Newtonians, besides the answer just now given to the most formidable objections of their opponents, have endeavoured to prove the impossibility of light being a vibration in any fluid. Sir Isaac, in his *Principia*, demonstrates, that no rectilinear motion can be propagated among the particles of any fluid unless these particles lie in right lines; and he hath also shewn, that all motion propagated through a fluid diverges from a rectilinear progress into the unmoved spaces. Hence he concludes, “a pressure on a fluid medium (i. e. a motion propagated by such a medium beyond any obstacle, which impedes any part of its motion,) cannot be propagated in right lines, but will be always inflecting and diffusing itself every way, to the quiescent medium beyond that obstacle. The power of gravity tends downwards; but the pressure of water rising from it, tends every way with an equable force, and is propagated with equal ease, and equal strength, in curves, as in straight lines. Waves, on the surface of the water, gliding by the extremes of any very large obstacle, inflect and dilate themselves, still diffusing, gradually, into the quiescent water beyond that obstacle. The waves, pulses, or vibrations of the air, wherein sound consists, are manifestly inflected, though not so considerably as the waves of water; and sounds are propagated with equal ease, thro' crooked tubes, and through straight lines; but light was never known to move in any curve, nor to inflect itself *ad unbram*.”

To this Mr Rowing adds another proof. “The Cartesian notion of light, (says he), was not that it is propagated from luminous bodies by the emission of small particles, but that it was communicated to the organ of sight by their pressure upon the materia subtilis, with which they supposed the universe to be full. But, according to this hypothesis, it could never be dark; because, when a fluid sustains any pressure, if that fluid fills all the space it takes up, absolutely, without leaving any pores, which is the case of the supposed materia subtilis, then that pressure must necessarily be communicated *equally and instantaneously* to every part. And therefore, whether the sun were above or below the horizon, the pressure communicated, and consequently the light, would be the same. And farther, as the pressure would be instantaneous, so would the light, which is contrary to what is collected from the eclipses of Jupiter's satellites.”

It is obvious, however, that, whatever side we take concerning the nature of light, many, indeed almost all the circumstances concerning it, are incomprehensible, and beyond the reach of human understanding.

Most of the discursive flowers, by some power unknown to us, follow the sun in his course. They attend him to his evening retreat, and meet his rising lustre in the morning with the same unerring law. If a plant also is shut up in a dark room, and a small hole is afterwards opened by which the light of the sun may enter, the plant will turn towards that hole, and even alter its own shape in order to get near it; so that though it was straight before, it will in time become crooked, that it may get near the light. It is not the heat, but the light of the sun, which it thus covets; for, though a fire be kept in the room, capable of giving

Light.

Objections against the Cartesian opinion, by Sir Isaac Newton.

By Mr Rowing.

Unaccountable properties of light.



Light.

a much stronger heat than the sun, the plant will turn away from the fire in order to enjoy the sun's light.—The green colour of plants also depends on the sun's light being allowed to shine upon them; for without this they are always white.—From this last circumstance, and likewise the property which the solar light has of blackening precipitates of silver from the nitrous acid \*, it hath been thought that light either contains the phlogiston in very considerable quantity, or is itself a modification of that unknown substance. But that this cannot be the case, we have now a proof little short of demonstration, from the last experiments of Dr Priestley concerning the production of pure dephlogisticated air from pump-water, by means of the solar light. If light either were the phlogiston itself, or contained it in very considerable quantity, it is impossible the air produced by its means could be pure and dephlogisticated. See the articles GAS and AIR, in the APPENDIX.—For the properties of light acting as the medium of our perceptions by the sense of sight, see the article OPTICS.

**LIGHT independent of Heat.** In general, a very considerable degree of heat is requisite to the emission of light from any body; but there are several exceptions to this, especially in light proceeding from putrescent substances and phosphorus, together with that of luminous animals, and other similar appearances. Light proceeding from putrescent animal and vegetable substances, as well as from glow-worms, is mentioned by Aristotle. Thomas Bartholin mentions four kinds of luminous insects, two with wings, and two without; but in hot climates travellers say they are found in much greater numbers, and of different species. Columna, an industrious naturalist, observes, that their light is not extinguished immediately upon the death of the animal.

The first distinct account that we meet with of light proceeding from putrescent animal-flesh is that which is given by Fabricius ab Aquapendente, who says, that when three Roman youths, residing at Padua, had bought a lamb, and had eaten part of it on Easter-day 1592, several pieces of the remainder, which they kept till the day following, shone like so many candles, when they were casually viewed in the dark. Part of this luminous flesh was immediately sent to Aquapendente, who was professor of anatomy in that city. He observed, that both the lean and the fat of this meat shone with a whitish kind of light, and also took notice, that some pieces of kid's flesh, which had happened to have lain in contact with it, was luminous, as well as the fingers and other parts of the bodies of those persons who touched it. Those parts, he observed, shone the most which were soft to the touch, and seemed to be transparent in candle-light; but where the flesh was thick and solid, or where a bone was near the outside, it did not shine.

After this appearance, we find no account of any other similar to it, before that which was observed by Bartholin, and of which he gives a very pompous description in his ingenious treatise already quoted. This happened at Montpellier in 1641, when a poor old woman had bought a piece of flesh in the market, intending to make use of it the day following. But happening not to be able to sleep well that night, and

her bed and pantry being in the same room, she observed so much light come from the flesh, as to illuminate all the place where it hung. A part of this luminous flesh was carried as a curiosity to Henry Bourbon, duke of Condé, the governor of the place, who viewed it for several hours with the greatest astonishment.

This light was observed to be whitish; and not to cover the whole surface of the flesh, but certain parts only, as if gems of unequal splendor had been scattered over it. This flesh was kept till it began to putrify, when the light vanished, which, as some religious people fancied, it did in the form of a cross.

It is natural to expect, that the almost universal experimental philosopher Mr Boyle should try the effect of his air-pump upon these luminous substances. Accordingly we find that he did not fail to do it; when he presently found that the light of rotten wood was extinguished in *vacuo*, and revived again on the admission of the air, even after a long continuance in *vacuo*; but the extinguishing of this light was not so complete immediately upon exhausting the receiver, as some little time afterwards. He could not perceive, however, that the light of rotten wood was increased in condensed air; but this, he imagined, might arise from his not being able to judge very well of the degree of light, through so thick and cloudy a glass-vessel as he then made use of; but we find that the light of a shining fish, which was put into a condensing engine before the Royal Society, in 1668, was rendered more vivid by that means. The principal of Mr Boyle's experiments were made in October 1667.

This philosopher attended to a great variety of circumstances relating to this curious phenomenon. Among other things, he observed, that change of air was not necessary to the maintenance of this light; for it continued a long time when a piece of the wood was put into a very small glass hermetically sealed, and it made no difference when this tube which contained the wood was put into an exhausted receiver. This he also observed with respect to a luminous fish, which he put into water, and placed in the same circumstances. He also found, that the light of shining fishes had other properties in common with that of shining wood; but the latter, he says, was presently quenched with water, spirit of wine, a great variety of saline mixtures, and other fluids. Water, however, did not quench all the light of some shining veal, on which he tried it, tho' spirit of wine destroyed its virtue presently.

Mr Boyle's observation of light proceeding from flesh-meat was quite casual. On the 15th of February 1662, one of his servants was greatly alarmed with the shining of some veal, which had been kept a few days, but had no bad smell, and was in a state very proper for use. The servant immediately made his master acquainted with this extraordinary appearance; and though he was then in bed, he ordered it to be immediately brought to him, and he examined it with the greatest attention. Suspecting that the state of the atmosphere had some share in the production of this phenomenon, he takes notice, after describing the appearance, that the wind was south-west

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Light.

and blustering, the air hot for the season, the moon was past its last quarter, and the mercury in the barometer was at 29 $\frac{1}{2}$  inches.

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I light from  
fishes.

Mr Boyle was often disappointed in his experiments on shining-fishes; finding, that they did not always shine in the very same circumstances, as far as he could judge, with others which had shined before. At one time that they failed to shine, according to his expectations, he observed that the weather was variable, and not without some days of frost and snow. In general, he made use of whittings, finding them the fittest for his purpose. In a discourse, however, upon this subject at the Royal Society in 1681, it was asserted, that, of all fishy substances, the eggs of lobsters, after they had been boiled, shone the brightest. Olig. Jacobæus, observes, that, upon opening a scapolypus, it was so luminous, as to startle several persons who saw it; and he says, that the more putrid the fish was, the more luminous it grew. The nails also and the fingers of the persons who touched it became luminous; and the black liquor which issued from the animal, and which is its bile, shone also, but with a very faint light.

AG. Hæfn.  
vol. v.  
p. 282.

Mr Boyle draws a minute comparison between the light of burning coals and that of shining wood or fish, showing in what particulars they agree, and in what they differ. Among other things, he observes, that extreme cold extinguishes the light of shining wood, as appeared when a piece of it was put into a glass tube, and held in a frigorific mixture. He also found that rotten wood did not waste itself by shining, and that the application of a thermometer to it did not discover the least degree of heat.

17  
Of the pho-  
las, a re-  
markably  
luminous  
fish.

There is a remarkable shell-fish called *PHOLAS*, which forms for itself holes in various kinds of stone, &c. That this fish is luminous, was noticed by Pliny; who observes, that it shines in the mouth of the person who eats it, and, if it touch his hands or cloaths, makes them luminous. He also says that the light depends upon its moisture. The light of this fish has furnished matter for various observations and experiments to M. Reaumur, and the Bolognian academicians, especially Beccarius, who took so much pains with the subject of phosphoreal light.

M. Reaumur observes, that, whereas other fishes give light when they tend to putrefcence, this is more luminous in proportion to its being fresh; that when they are dried, their light will revive if they be moistened either with fresh or salt water, but that brandy immediately extinguishes it. He endeavoured to make this light permanent, but none of his schemes succeeded.

The attention of the Bolognian academicians was engaged to this subject by M. F. Marfilus, in 1724, who brought a number of these fishes, and the stones in which they were inclosed, to Bologna, on purpose for their examination.

Cam. Bonon.  
vol. ii. 231.

Beccarius observed, that though this fish ceased to shine when it became putrid; yet that, in its most putrid state, it would shine, and make the water in which it was immersed luminous, when they were agitated. Galeatus and Montius found, that wine or vinegar extinguished this light: that in common oil it continued some days; but in rectified spirit of wine, or urine, hardly a minute.

Light.

In order to observe in what manner this light was affected by different degrees of heat, they made use of a Reaumur's thermometer, and found that water rendered luminous by these fishes increased in light till the heat arrived to 45 degrees; but that it then became suddenly extinct, and could not be revived.

In the experiments of Beccarius, a solution of sea-salt increased the light of the luminous water, a solution of nitre did not increase it quite so much. Sal ammoniac diminished it a little, oil of tartar *per deliquum* nearly extinguished it, and the acids entirely. This water poured upon fresh calcined gypsum, rock crystal, cerufs, or sugar, became more luminous. He also tried the effects of it when poured upon various other substances, but there was nothing very remarkable in them. Afterwards, using luminous milk, he found that oil of vitriol extinguished the light, but that oil of tartar increased it.

This gentleman had the curiosity to try how differently coloured substances were affected by this kind of light; and having, for this purpose, dipped several ribbons in it, the white came out the brightest, next to this was the yellow, and then the green; the other colours could hardly be perceived. It was not, however, any particular colour, but only light that was perceived in this case. He then dipped boards painted with the different colours, and also glass tubes, filled with substances of different colours, in water rendered luminous by the fishes. In both these cases the red was hardly visible, the yellow was the brightest, and the violet the dullest. But on the boards the blue was nearly equal to the yellow, and the green more languid; whereas in the glasses, the blue was inferior to the green.

Of all the liquors to which he put the pholades, milk was rendered the most luminous. A single pholas made seven ounces of milk so luminous, that the faces of persons might be distinguished by it, and it looked as if it was transparent.

Air appeared to be necessary to this light; for when Beccarius put the luminous milk into glass tubes, no agitation would make it shine, unless bubbles of air were mixed with it. Also Montius and Galeatus found, that, in an exhausted receiver, the pholas lost its light, but the water was sometimes made more luminous; which they ascribed to the rising of bubbles of air through it.

Beccarius, as well as Reaumur, had many schemes to render the light of these pholades permanent. For this purpose he kneaded the juice into a kind of paste, with flour, and found that it would give light when it was immersed in warm water; but it answered best to preserve the fish in honey. In any other method of preservation, the property of becoming luminous would not continue longer than six months, but in honey it had lasted above a year; and then it would, when plunged in warm water, give as much light as ever it had done.

Similar, in some respects, to those observations on the light of the pholas, was that which was observed to proceed from wood which was moist, but not in a putrid state, which was very conspicuous in the dark.

That the sea is sometimes luminous, especially when it is put in motion by the dashing of oars or the beating

AG. Cal-  
rensis,  
vol. v.  
p. 485.

Light. beating of it against a ship, has been observed with admiration by a great number of persons. Mr Boyle, after reciting all the circumstances of this appearance, as far as he could collect them from the accounts of navigators; as its being extended as far as the eye could reach, and at other times being visible only when the water was dashed against some other body; that, in some seas, this phenomenon is accompanied by some particular winds, but not in others; and that sometimes one part of the sea will be luminous, when another part, not far from it, will not be so; concludes with saying, that he could not help suspecting that these odd phenomena, belonging to great masses of water, were in some measure owing to some comical law, or custom of the terrestrial globe, or at least of the planetary vortex.

19 Beal's experiments on fishes. Some curious observations on the shining of some fishes, and the pickle in which they were immerged, were made by Dr Beal, in May 1665; and had they been properly attended to and pursued, might have led to the discovery of the cause of this appearance. Having put some boiled mackerel into water, together with salt and sweet herbs; when the cook was, some time after, stirring it, in order to take out some of the fishes, he observed, that, at the first motion, the water was very luminous; and that the fish shining through the water, added much to the light which the water yielded. The water was of itself thick and blackish, rather than of any other colour; and yet it shined on being stirred, and at the same time the fishes appeared more luminous than the water. Wherever the drops of this water, after it had been stirred, fell to the ground, they shined; and the children in the family diverted themselves with taking the drops, which were as broad as a penny, and running with them about the house. The cook observed, that, when she turned up that side of the fish that was lowest, no light came from it; and that, when the water had settled for some time, it did not shine at all. The day following, the water gave but little light, and only after a brisk agitation, though the fishes continued to shine as well from the inside as the outside, and especially about the throat, and such places as seemed to have been a little broken in the boiling.

When, in the light of the sun, he examined, with a microscope, a small piece of a fish which had shined very much the night before, he found nothing remarkable on its surface, except that he thought he perceived what he calls a *steam*, rather dark than luminous, arising like a very small dust from the fish, and here and there a very small and almost imperceptible sparkle. Of the sparkles he had no doubt; but he thought it possible that the *steam* might be a deception of the sight, or some dust in the air.

Finding the fish to be quite dry, he moistened it with his spittle; and then observed that it gave a little light, though but for a short time. The fish at that time was not fetid, nor yet insipid to the best discerning palate. Two of the fishes he kept two or three days longer for farther trial; but, the weather being very hot, they became fetid; and, contrary to his expectations, there was no more light produced either by the agitation of the water, or in the fish.

Father Bourzes, in his voyage to the Indies, in 1704, took particular notice of the luminous appear-

ance of the sea. The light was sometimes so great, that he could easily read the title of a book by it, though he was nine or ten feet from the surface of the water. Sometimes he could easily distinguish, in the wake of the ship, the particles that were luminous from those that were not; and they appeared not to be all of the same figure. Some of them were like points of light, and others such as stars appear to the naked eye. Some of them were like globes, of a line or two in diameter; and others as big as one's head. Sometimes they formed themselves into squares of three or four inches long, and one or two broad. Sometimes all these different figures were visible at the same time; and sometimes there were what he calls *vortices* of light, which at one particular time appeared and disappeared immediately, like flashes of lightning.

Nor did only the wake of the ship produce this light, but fishes also, in swimming, left so luminous a track behind them, that both their size and species might be distinguished by it. When he took some of the water out of the sea, and stirred it ever so little with his hand, in the dark, he always saw in it an infinite number of bright particles; and he had the same appearance whenever he dipped a piece of linen in the sea, and wrung it in a dark place, even though it was half dry; and he observed, that when the sparkles fell upon anything that was solid, it would continue shining for some hours together.

After mentioning several circumstances which did not contribute to this appearance, this Father observes, that it depends very much upon the *quality* of the water; and he was pretty sure that this light is the greatest when the water is freshest, and fullest of foam. For in the main sea, he says, the water is not everywhere equally pure; and that sometimes, if linen be dipped in the sea, it is clammy when it is drawn up again; and he often observed, that when the wake of the ship was the brightest, the water was the most fat and glutinous, and that linen moistened with it produced a great deal of light, if it was stirred or moved briskly. Besides, in some parts of the sea, he saw a substance like saw-dust, sometimes red, and sometimes yellow; and when he drew up the water in those places, it was always viscous and glutinous. The sailors told him, that it was the spawn of whales; that there are great quantities of it in the North; and that sometimes, in the night, they appeared all over of a bright light, without being put in motion by any vessel or fish passing by them.

As a confirmation of this conjecture, that the more glutinous the sea-water is, the more it is disposed to become luminous, he observes, that one day they took a fish which was called a *bonite*, the inside of the mouth of which was so luminous, that, without any other light, he could read the same characters which he had before read by the light in the wake of the ship; and the mouth of this fish was full of a viscous matter, which, when it was rubbed upon a piece of wood, made it immediately all over luminous; though, when the moisture was dried up, the light was extinguished.

The abbé Nollet was much struck with the luminousness of the sea when he was at Venice in 1749; and, after taking a great deal of pains to ascertain the circumstances of it, concluded that it was occasioned



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by a shining insect; and having examined the water very often, he at length did find a small insect, which he particularly describes, and to which he attributes the light. The same hypothesis had also occurred to M. Vianelli, professor of medicine in Chioggia near Venice; and both he and M. Grizzellini, a physician in Venice, have given drawings of the insects from which they imagined this light to proceed.

The abbé was the more confirmed in his hypothesis, by observing, some time after, the motion of some luminous particles in the sea. For, going into the water, and keeping his head just above the surface, he saw them dart from the bottom, which was covered with weeds, to the top, in a manner which he thought very much resembled the motions of insects; though, when he endeavoured to catch them, he only found some luminous spots upon his handkerchief, which were enlarged when he pressed them with his finger.

23  
Observations of M.  
le Roi.

Mémoires  
Présumées,  
vol. iii. 144.

M. le Roi, making a voyage on the Mediterranean, presently after the abbé Nollet made his observations at Venice, took notice, that, in the day-time, the prow of the ship in motion threw up many small particles, which, falling upon the water, rolled upon the surface of the sea for a few seconds, before they mixed with it; and in the night the same particles, as he concluded, had the appearance of fire. Taking a quantity of the water, the same small sparks appeared whenever it was agitated; but, as was observed with respect to Dr Beal's experiments, every successive agitation produced a less effect than the preceding, except after being suffered to rest a while; for then a fresh agitation would make it almost as luminous as the first. This water, he observed, would retain its property of shining by agitation a day or two; but it disappeared immediately on being set on the fire, tho' it was not made to boil.

This gentleman, after giving much attention to this phenomenon, concludes, that it is not occasioned by any shining insects, as the abbé Nollet imagined; especially as, after carefully examining some of the luminous points, which he caught upon an handkerchief, he found them to be round like large pins heads, but with nothing of the appearance of any animal, though he viewed them with a microscope. He also found, that the mixture of a little spirit of wine with water just drawn from the sea, would give the appearance of a great number of little sparks, which would continue visible longer than those in the ocean. All the acids, and various other liquors, produced the same effect, though not quite so conspicuously; but no fresh agitation would make them luminous again. M. le Roi is far from asserting that there are no luminous insects in the sea. He even supposes that the abbé Nollet and M. Vianelli had found them. But he was satisfied that the sea is luminous chiefly on some other account, though he does not so much as advance a conjecture about what it is.

24  
Experiments by  
M. Ant.  
Martin.

Swed.  
Abhand.  
vol. xxiii.  
p. 255.

M. Ant. Martin made many experiments on the light of fishes, with a view to discover the cause of the light of the sea. He thought that he had reason to conclude, from a great variety of experiments, that all sea-fishes have this property; but that it is not to be found in any that are produced in fresh water. Nothing depended upon the colour of the fishes, except

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that he thought that the white ones, and especially those that had white scales, were a little more luminous than others. This light, he found, was increased by a small quantity of salt; and also by a small degree of warmth, though a greater degree extinguished it. This agrees with another observation of his, that it depends entirely upon a kind of moisture which they had about them, and which a small degree of heat would expel, when an oiliness remained which did not give this light, but would burn in the fire. Light from the flesh of birds or beasts is not so bright, he says, as that which proceeds from fish. Human bodies, he says, have sometimes emitted light about the time that they began to putrefy, and the walls and roof of a place in which dead bodies had often been exposed, had a kind of dew or clamminess upon it, which was sometimes luminous; and he imagined that the lights which are said to be seen in burying-grounds may be owing to this cause.

From some experiments made by Mr Canton, he <sup>25</sup> Mr concludes, that the luminousness of sea-water is owing <sup>Canton.</sup> to the slimy and other putrescent substances it contains. On the evening of the 14th of June 1768, he put a small fresh whitening into a gallon of sea-water, in a pan which was about 14 inches in diameter, and took notice that neither the whitening nor the water, when agitated, gave any light. A Fahrenheit's thermometer, in the cellar where the pan was placed, stood at 54°. The 15th, at night, that part of the fish which was even with the surface of the water was luminous, but the water itself was dark. He drew the end of a stick through it, from one side of the pan to the other; and the water appeared luminous behind the stick all the way, but gave light only where it was disturbed. When all the water was stirred, the whole became luminous, and appeared like milk, giving a considerable degree of light to the sides of the pan; and it continued to do so for some time after it was at rest. The water was most luminous when the fish had been in it about 28 hours; but would not give any light by being stirred, after it had been in it three days.

He then put a gallon of fresh water into one pan, and an equal quantity of sea-water into another, and into each pan he put a fresh herring of about three ounces. The next night the whole surface of the sea-water was luminous, without being stirred; but it was much more so when it was put in motion; and the upper part of the herring, which was considerably below the surface of the water, was also very bright; while at the same time, the fresh water, and the fish that was in it, were quite dark. There were several very bright luminous spots on different parts of the surface of the sea-water; and the whole, when viewed by the light of a candle, seemed covered with a greasy scum. The third night, the light of the sea-water, while at rest, was very little, if at all, less than before; but when stirred, its light was so great as to discover the time by a watch, and the fish in it appeared as a dark substance. After this, its light was evidently decreasing, but was not quite gone before the 7th night. The fresh water and the fish in it were perfectly dark during the whole time. The thermometer was generally above 60°.

The preceding experiments were made with sea-water;

water: but he now made use of other water, into which he put common or sea salt, till he found, by an hydrometer, that it was of the same specific gravity with the sea-water; and, at the same time, in another gallon of water, he dissolved two pounds of salt; and into each of these waters he put a small fresh herring. The next evening the whole surface of the artificial sea-water was luminous without being stirred; but gave much more light when it was disturbed. It appeared exactly like the real sea water in the preceding experiment; its light lasted about the same time, and went off in the same manner: while the other water, which was almost as salt as it could be made, never gave any light. The herring which was taken out of it the 7th night, and washed from its salt, was found firm and sweet; but the other herring was very soft and putrid, much more so than that which had been kept as long in fresh water. If a herring, in warm weather, be put into 10 gallons of artificial sea-water, instead of one, the water, he says, will still become luminous, but its light will not be so strong.

It appeared by some of the first observations on this subject, that *heat* extinguishes the light of putrescent substances. Mr. Canton also attended to this circumstance; and observes, that though the greatest summer heat is well known to promote putrefaction, yet 20 degrees more than that of the human blood seems to hinder it. For putting a small piece of a luminous fish into a thin glass ball, he found, that water of the heat of 118 degrees would extinguish its light in less than half a minute; but that, on taking it out of the water, it would begin to recover its light in about 10 seconds; but it was never afterwards so bright as before.

Mr. Canton made the same observation that Mr. Ant. Martin had done, viz. that several kinds of river fish could not be made to give light, in the same circumstances in which any sea-fish became luminous. He says, however, that a piece of carp made the water very luminous, though the outside, or scaly part of it, did not shine at all.

For the sake of those persons who may choose to repeat his experiments, he observes, that artificial sea-water may be made without the use of an hydrometer, by the proportion of four ounces avoirdupois of salt, to seven pints of water, wine-measure.

From undoubted observations, however, it appears, that in many places of the ocean it is covered with luminous insects to a very considerable extent. Mr. Dagelet, a French astronomer, who returned from the Terra Australis in the year 1774, brought with him several kinds of worms which shine in water when it is set in motion; and M. Rigaud, in a paper inserted (if we are not mistaken), in the *Journal des Sçavans* for the month of March 1770, affirms, that the luminous surface of the sea, from the port of Brest to the Antilles, contains an immense quantity of little, round, shining poly-puses of about a quarter of a line in diameter. Other learned men, who acknowledge the existence of these luminous animals, cannot, however, be persuaded to consider them as the cause of all that light and scintillation that appear on the surface of the ocean: they think that some substance of the phosphorus kind, arising

from putrefaction, must be admitted as one of the causes of this phenomenon. M. Godehoue has published curious observations on a kind of fish, called in French *bonite*, already mentioned; and though he has observed, and accurately described, several of the luminous insects that are found in sea-water, he is, nevertheless, of opinion, that the scintillation and flaming light of the sea proceed from the oily and greasy substances with which it is impregnated.

The abbe Nollet was long of opinion, that the light of the sea proceeded from electricity (A); though he afterwards seemed inclined to think, that this phenomenon was caused by small animals, either by their luminous aspect, or at least by some liquor or effluvia which they emitted. He did not, however, exclude other causes; among these, the spawn or fry of fish deserves to be noticed. M. Dagelet, sailing into the bay of Antongil, in the island of Madagascar, observed a prodigious quantity of fry, which covered the surface of the sea above a mile in length, and which he at first took for banks of sand on account of their colour; they exhaled a disagreeable odour, and the sea had appeared with uncommon splendour some days before. The same accurate observer, perceiving the sea remarkably luminous in the road of the Cape of Good Hope during a perfect calm, remarked that the oars of the canoes produced a whitish and pearly kind of lustre: when he took in his hand the water which contained phosphorus, he discerned in it, for some minutes, globules of light as large as the heads of pins. When he pressed these globules, they appeared to his touch like a soft and thin pulp; and some days after the sea was covered, near the coasts, with whole banks of these little fish in innumerable multitudes.

To putrefaction, also, some are willing to attribute that luminous appearance which goes by the name of *ignis fatuus*, or in common English *Will with a wisp*, to which the credulous vulgar ascribe very extraordinary and especially mischievous powers. This phenomenon is chiefly visible in damp places; and is also said to be very often seen in burying-grounds, and near dunghills. Travellers say, that it is very frequent near Bologna in Italy, and in several parts of Spain and Ethiopia. The form and size of it are very various, and often variable.

It was the opinion of many philosophers, and especially Willoughby and Ray, that the *ignis fatuus* is made by shining insects; but this opinion was never well supported. Sir Isaac Newton calls it a *vapour shining without heat*; and supposes that there is the same difference between this vapour and flame, that there is between wood shining without heat, and burning coals of fire. That this opinion is just, and, moreover, that the light of this vapour shining without heat is of the same nature with light from putrescent substances, according to the supporters of the putrefactive hypothesis, may be concluded from the following circumstances relating to them, as described by Dr Derham and G. B. Beccari.

The former of these gentlemen, having observed an *ignis fatuus* in some boggy ground, between two rocky hills, in a dark and calm night, got by degrees within two or three yards of it, and thereby had an opportunity

(A) This hypothesis was also maintained in a treatise published at Venice in 1746, by an officer in the Austrian service, under the following title, *Dell' Eletresismo*.

tunity of viewing it to the greatest advantage. It kept skipping about a dead thistle, till a slight motion of the air, occasioned, as he supposed, by his near approach to it, made it jump to another place; and as he advanced, it kept flying before him. He was so near to it, that, had it been the shining of glow-worms, he was satisfied that he could not but have distinguished the separate lights of which it must have consisted; whereas it was one uniform body of light. He therefore thought that it must be an ignited vapour (a).

M. Beccari made it his business to inquire concerning this phenomenon of all his acquaintance who had opportunities of observing it, either on the mountains, or on the plain. He found, that two which appeared on the plains, one to the north and the other to the east of Bologna, were to be seen almost every dark night, especially the latter; and the light they gave was equal to that of an ordinary faggot. That to the east of Bologna once appeared to a gentleman of his acquaintance as he was travelling, and kept him company above a mile, constantly moving before him, and casting a stronger light upon the road than the torch which was carried along with him. All these luminous appearances, he says, gave light enough to make all neighbouring objects visible; and they are always observed to be in motion, but this motion was various and uncertain. Sometimes they would rise up, and at other times sink; but they commonly kept hovering about six feet from the ground. They would also disappear of a sudden, and instantly appear again in some other place. They differed both in size and figure; sometimes spreading pretty wide, and then again contracting themselves; sometimes breaking into two, and then joining again; sometimes floating like waves, and dropping, as it were, sparks of fire. He was assured that there was not a dark night all the year round in which they did not appear, and that they were observed more frequently when the ground was covered with snow, than in the hottest summer: nor did rain or snow in the least hinder their appearance; but, on the contrary, they were observed more frequently, and cast a stronger light, in rainy and wet weather; nor were they much affected by the wind.

The grounds to the east of Bologna, where the largest of these appearances was seen, is, he says, a hard chalky and clayey soil, which will retain the water a long time, and afterwards, in hot weather, would break into large cracks; but on the mountains, where the *ignis fatui* were smaller, the soil was of a loose sandy texture, which would not keep the water very long. According to the best information he could procure, these lights very much frequent brooks and rivers, being often observed on the banks of them; particularly, says he, because the current of air carries them thither more readily than to any other place.

This gentleman concludes his account of these appearances with the following curious narrative. An intelligent gentleman travelling in March, between eight and nine in the evening, in a mountainous road about ten miles south of Bologna, perceived a light which shone very strongly upon some stones that lay on the banks of the river Riverde. It seemed to be about

two feet above the stones, and not far from the water. In size and figure it had the appearance of a paralleloiped, somewhat more than a foot in length, and half a foot high, the longest side being parallel to the horizon. Its light was so strong, that he could plainly distinguish by it part of a neighbouring hedge and the water of the river; only in the east corner of it the light was rather faint, and the square figure less perfect, as if it was cut off or darkened by the segment of a circle.

His curiosity tempting him to examine this appearance a little nearer, he advanced gently towards the place; but was surprised to find that it changed gradually from a bright red, first to a yellowish, and then to a pale colour, in proportion as he drew nearer; and when he came to the place itself, it quite vanished. Upon this he stepped back, and not only saw it again, but found that the farther he went from it, the stronger and brighter it grew. When he examined the place of this luminous appearance, he could not perceive the least smell, or any other mark of fire.

This extraordinary account was confirmed to M. Beccari by another gentleman who frequently travelled the same road, and who assured him that he had seen the very same light five or six different times, in spring and autumn, and that he had always observed it to be of the very same shape, and in the same place; and he once took particular notice of its coming out of a neighbouring place, and settling itself in the figure above described.

M. Beccari owns himself to be greatly at a loss to account not only for this very remarkable appearance, but also for the *ignis fatui* in general. He only says, that all persons who ever saw any of these appearances, agree, that they cast a light quite different from that of shining fires.

Dr Shaw describes an *ignis fatuus* which he saw in the Holy Land; the circumstances of which are so remarkable, that they well deserve to be recited, especially as some of them seem to point at the cause of the phenomenon. As he and his company were travelling by night through the valleys of Mount Ephraim, they were attended more than an hour by an *ignis fatuus*, which was sometimes globular, or in the form of the flame of a candle; and which would immediately afterwards spread itself so much as to involve the whole company in a pale inoffensive light, and then contract itself again, and suddenly disappear. But in less than a minute it would become visible as before; or, running along from one place to another, with a swift progressive motion, would expand itself at certain intervals, over more than two or three acres of the adjacent mountains. The atmosphere from the beginning of the evening had been remarkably thick and hazy, and the dew, as they felt it upon their bridges, was unusually clammy and unctuous. In the same kind of weather, he says, he has observed those luminous appearances, which at sea skip about the masts and yards of ships, and which the sailors call *corpufanfæ*, which is a corruption of the Spanish *Cuerpo santo*.

A light in some respects similar to those above-mentioned has been found to proceed from that celebrated light-chemical

(a) Similar in some respects to this light, was one that surrounded the body and the bed of a woman at Milan, which fled from the hand that approached it, but was at length dispersed by the agitation of the air. *Atta Casarierfia*, Vol. III. p. 11.



Light.

chemical production called *phosphorus*, which always tends to decompose itself, so as to take fire by the access of *air* only. Phosphorus, therefore, when it emits light, is properly a body ignited; though when a very small quantity of it is used, as what is left after drawing it over paper, or what may be dissolved in essential oil, the heat is not sensible. But perhaps the matter which emits the light in what we call *putrescent substances* may be similar to it, though it be generated by a different process, and burn with a less degree of heat. Putrescence does not seem to be necessary to the light of glow-worms, or of the pholades; and yet their light is sufficiently similar to that of shining wood or flesh. Electric light is unquestionably similar to that of phosphorus, though the source of it is apparently very different.

Kunckel formed his phosphorus into a kind of pills about the size of peas, which being moistened a little, and scraped in the dark, yielded a very considerable light, but not without smoke. The light was much more pleasing when eight or ten of these pills were put into a glass of water; for being shaken in the dark, the whole glass seemed to be filled with light. Kunckel also reduced his phosphorus into the form of larger stones, which being warmed by a person's hand, and rubbed upon paper, would describe letters that were very legible in the dark.

The greatest variety of experiments with the light of phosphorus was made by Dr Slare; who says, that the liquid phosphorus (which is nothing more than the solid phosphorus dissolved in any of the essential oils) would not hurt even a lady's hand; or that, when the hands or face were washed with it, it would not only make them visible to other persons in the dark, but that the light was so considerable as to make other neighbouring objects visible.

When the solid phosphorus is quite immersed in water, he observes that it ceases to shine; but that if any part of it chance to emerge, or get into the air, it will shine though the glass be hermetically sealed. In a large glass he kept it without water for several days; and yet it continued shining, with very little diminution of its light or weight. If the letters that were written with this phosphorus were warmed by the fire, they presently became dark lines, which continued upon the paper, like ink. To try how much light was given by a small quantity of this phosphorus, he observed that it continued to flame in the open air for seven or eight days; the light being visible whenever he shut his window.

As air was generally thought to contain the *pabulum* of flame, Dr Slare was determined to try this with respect to phosphorus; and for this purpose he placed a large piece of it in a receiver; but upon exhausting it, he perceived that it became more luminous, and that, upon admitting the air, it returned to its former state. This property of the light of phosphorus, which is the very reverse of that of shining wood and fishes, was also ascertained by several very accurate experiments of Mr Hauksbee's.

Endeavouring to blow the phosphorus into a flame with a pair of bellows, Dr Slare found that it was presently blown out, and that it was a considerable time before the light revived again. All liquors would extinguish this light when the phosphorus was put into

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them; nor would it shine or burn, though it was even boiled in the most inflammable liquors, as oil of olives, spirit of turpentine, or even spirit of wine.

In order to keep his phosphorus from consuming, he used to put it in a glass of water; and sometimes he has seen it, when thus immersed in water, make such bright and vigorous coruscations in the air, as, he says, would surprise and frighten those who are not used to the phenomenon. This fiery meteor, he says, is contracted in its passage through the water, but expands as soon as it gets above it. If any person would make this experiment to advantage, he informs them that the glass must be deep and cylindrical, and not above three quarters filled with water. This effect he perceived in warm weather only, and never in cold.

The phosphorus of which we have been treating is prepared from urine; but in some cases the sweat, which is similar to urine, has been observed to be phosphoreous, without any preparation. This once happened to a person who used to eat great quantities of salt, and who was a little subject to the gout, after sweating with violent exercise. Stripping himself in the dark, his shirt seemed to be all on fire, which surprised him very much. Upon examination, red spots were found upon his shirt; and the physician who was present perceived an urinous smell, though it had nothing in it of volatile alkali, but of the muriatic acid; the same, he says, that issues from cabbage much salted, and strongly fermenting.

The easiest method of accounting for all these kinds of lights, perhaps, is from electricity. If light consists in a certain vibration of the electric fluid,\* then it follows, that in whatever substance such a vibration takes place, there light must appear, whether in putrescent animal-substances, sea-water, phosphorus, or any thing else. We know that the electric matter pervades all terrestrial substances, and is very liable to be set in motion from causes of which we are ignorant. The action of the air by which putrefaction is produced may be one of these causes; and it can by no means appear surprising that the electric matter should act in the bodies of living animals in such a manner as to produce a permanent light, when we certainly know it acts in some of them so powerfully as to produce a shock similar to that of a charged vial.—On this subject we shall only observe farther, that when this vibration becomes so powerful as to penetrate the solid substance of the body itself, the luminous body then becomes transparent, as in the milk abovementioned; but, when it is only superficial, the body, though it emits light, is itself opaque.

**LIGHT-HOUSES**, in maritime affairs, a building on the sea-shore, a promontory, a rock, &c. wherein is kept a light during the night in order to direct vessels sailing near the place.

**LIGHT-ROOM**, a small apartment, inclosed with glass-windows, near the magazine of a ship of war. It is used to contain the lights by which the gunner and his assistants are enabled to fill cartridges with powder to be ready for action.

**LIGHTER**, a large, open, flat-bottomed vessel, generally managed with oars, and employed to carry goods to or from a ship when she is to be laden or delivered.—There are also some lighters furnished with a deck throughout their whole length, in order to contain

Light,  
Lighter.

Alta Cas-  
vol. v.  
p. 334.

29  
All these  
lights are  
accounted for  
from elec-  
tricity.  
\* See Elec-  
tricity.  
no 82, 83.

Lightning. tain those merchandizes which would be damaged by rainy weather: these are usually called *close lighters*.

LIGHTNING, a bright and vivid flash of fire, suddenly appearing in the atmosphere, and commonly disappearing in an instant, sometimes attended with clouds and thunder, and sometimes not.

1  
Different  
appearances  
of light-  
ning.

The phenomena of lightning are always surprising, and sometimes very terrible; neither is there any kind of natural appearance in which there is more diversity, nor two flashes being ever observed exactly similar to one another. In a serene sky, the lightning, in this country at least, almost always hath a kind of indistinct appearance without any determinate form, like the sudden illumination of the atmosphere occasioned by firing a quantity of loose gunpowder; but when accompanied with thunder, it is well defined, and hath very often a zig-zag form. Sometimes it makes only one angle, like the letter V, sometimes it hath several branches, and sometimes it appears like the arch of a circle. But the most formidable and destructive form which lightning is ever known to assume is that of balls of fire. The motion of these is very often easily perceptible to the eye; but wherever they fall, much mischief is occasioned by their bursting, which they always do with a sudden explosion, like that of fire-arms. Sometimes they will quietly run along, or rest for a little upon any thing, and then break into several pieces, each of which will explode; or the whole ball will burst at once, and produce its mischievous effects only in one place. The next to this in its destructive effects is the zig-zag kind; for that which appears like indistinct flashes, whose form cannot be readily observed, is seldom or never known to do hurt.—The colour of the lightning also indicates in some measure its power to do mischief; the palest and brightest flashes being most destructive; such as are red or of a darker colour, commonly doing less damage.

2  
Its seeming  
omnipre-  
sence.

A very surprising property of lightning, the zig-zag kind especially, when near, is its seeming omnipresence. If two persons are standing in a room looking different ways, and a loud clap of thunder accompanied with zig-zag lightning happens, they will both distinctly see the flash, not only by that indistinct illumination of the atmosphere which is occasioned by fire of any kind; but the very form of the lightning itself, and every angle it makes in its course, will be as distinctly perceptible, as though they had looked directly at the cloud from whence it proceeded. If a person happened at that time to be looking on a book, or other object which he held in his hand, he would distinctly see the form of the lightning between him and the object at which he looked. This property seems peculiar to lightning, and to belong to no other kind of fire whatever.

3  
Remark-  
able effects  
of light-  
ning.

The effects of lightning are generally confined within a small space; and are seldom similar to those which accompany explosions of gun-powder, or of inflammable air in mines. Instances of this kind, however, have occurred; the following is one of the most remarkable of which we have any distinct account. "August 2d 1763, about six in the evening, there arose at Anderlecht, about a league from Brussels, a conflict of several winds borne upon a thick fog. This conflict lasted four or five minutes, and was attended

with a frightful hissing noise, which could be compared to nothing but the yellings of an infinite number of wild beasts. The cloud then opening, discovered a kind of very bright lightning, and in an instant the roofs of one side of the houses were carried off and dispersed at a distance; above 1000 large trees were broke off, some near the ground, others near the top, some torn up by the roots; and many both of the branches and tops carried to the distance of 60, 100, or 120 paces; whole coppices were laid on one side, as corn is by ordinary winds. The glass of the windows which was most exposed was shivered to pieces. A tent in a gentleman's garden was carried to the distance of 4000 paces; and a branch torn from a large tree, struck a girl in the forehead as she was coming into town, at the distance of 40 paces from the trunk of the tree, and killed her on the spot."

These terrible effects seem to have been owing to the prodigious agitation in the air, occasioned by the emission of such a vast quantity of lightning at once; or perhaps to the agitation of the electric fluid itself, which is still more dangerous than any concussion of the atmosphere; for thunder-forms will sometimes produce most violent whirlwinds, such as are by the best philosophers attributed to electricity, nay, even occasion an agitation of the waters of the ocean itself, and all this too after the thunder and lightning have ceased.—Of this we have the following instances. "Great Malvern, October 16th 1761. On Wednesday last, we had the most violent thunder ever known in the memory of man. At a quarter past four in the afternoon, I was surprised with a most shocking and dismal noise; 100 forges (the nearest resemblance I can think of,) were they all at work at once, could scarce equal it. I ran to the fore-door, and casting my eye upon the side of the hill about 400 yards to the south-west of my house, there appeared a prodigious smoky, attended with the same violent noise. I ran back into the house, and cried out, a volcano (for so I thought) had burst out of the hill; but I had no sooner got back again, than I found it had descended, and was passing on within about 100 yards of the fourth end of my house. It seemed to rise again in the meadow just below it; and continued its progress to the east, rising in the same manner for four different times, attended with the same dismal noise as at first; the air being filled with a nauseous and sulphurous smell. I saw it gradually decrease till quite extinguished in a turnep-field about a quarter of a mile below my house. The turnip-leaves, with leaves of trees, dirt, sticks, &c. filled the air, and flew higher than any of these hills. The thunder ceased before this happened, and the air soon afterwards became calm and serene."—The vast column of smoke mentioned in the above letter was so large, that a physician of eminence at Worcester saw it in its progress down the hill, about a mile from Feckenham, which is above 20 miles from Malvern.—In August 1763, a most violent storm of thunder, rain, and hail, happened at London, which did damage in the adjacent country, to the amount of 50,000 l. Hailstones fell of an immense size, from two to ten inches circumference; but the most surprising circumstance was the sudden flux and reflux of the tide in Plymouth pool, exactly corresponding with the like  
agi-

Lightning.

Lightning. agitation in the same place, at the time of the great earthquake at Lisbon.

Instances are also to be found, where lightning, by its own proper force, without any assistance from those less common agitations of the atmosphere or electric fluid, hath thrown stones of immense weight to considerable distances; torn up trees by the root, and broke them in pieces; shattered rocks; beat down houses, and set them on fire, &c. All these, however, are to be considered as the more unusual phenomena of lightning; its common mode of action being entirely similar to that of a charged Leyden vial, where the electric matter discharges itself from a substance positively electrified to one that is negatively so. The identity of electric matter and lightning seems now, indeed, so well established, that there is not the least foundation for seeking any other solution of the phenomena of lightning, than what may be obtained by comparing them with those of our electrical experiments. The different forms of the flashes are all exemplified in those of electrical sparks. Where the quantity of electricity is small, and consequently incapable of striking at any considerable distance, the spark appears straight, without any curvature or angular appearance: but where the electricity is very strong, and of consequence capable of striking an object at a pretty considerable distance, it assumes a crooked or zig-zag form. This is always the case with Mr Nairn's very powerful machines, the conductors of which are six feet in length and one foot in diameter. Sparks may be taken from them at the distance of 16, 17, or even 20 inches; and all of these put on the angular zig-zag form of lightning. The reason of this appearance, both in these sparks and in the lightning, is, that the more fluid electric matter hath to pass through the denser and less fluid atmosphere with great rapidity; and in fact, this is the way in which all the more fluid substances pass through those that are less so, at least when their velocity becomes considerable.—If bubbles of air or steam pass very gently up through water, their course from the bottom to the top of the vessel will differ very little, if at all, from a straight line; but when they are impelled by a considerable force, as in air blown from a bellows, or the bubbles of steam which arise in boiling water, their course is then marked by waved and crooked lines, and the deflection of the bubbles to the right or left, will be precisely in proportion to their ascending velocity, and to the weight of the water by which they are resisted.

In the case of air blown through water, however, or steam ascending from the bottom of a vessel of boiling water, though the course of the bubbles is waved and crooked, we never observe it to be angular as in lightning. The reason of this is, that there is no proportion between the capacity of the air for yielding to the impetus of lightning, and the velocity with which the latter is moved. From Mr Robins's experiments in gunnery, it appears, that the air cannot yield with a velocity much greater than 1200 feet in a second, and that all projectiles moving with a greater degree of velocity meet with a violent resistance. But if we suppose lightning to move only with one half the velocity of light, that is, near 100,000 miles in a second, its motion in the fluid at-

mosphere will meet with a resistance very little inferior to what air would meet with in passing through the most solid bodies. The smallest difference of the resistance of the atmosphere on either side, must determine the lightning to that side; and in its passage to that new place where the resistance is least, it must pass on in a straight line, making an angle with its former course, because the atmosphere is altogether incapable of yielding with such rapidity as the electric matter requires, and therefore resists like a solid rock. The case is otherwise in the former examples: for tho' a small difference in the resistance forces the bubbles of air or steam to deviate from side to side, yet there is always a considerable proportion between the capacity of water for yielding, and that force by which the bubbles urge it to yield; so that though it does make a resistance sufficient to prevent the bubbles from moving in a straight line, yet it also perceptibly yields at all times, and therefore the track of the bubbles is formed by a number of curves and not angles.

Hence we may understand the reason why the zig-zag kind of lightning is so dangerous, namely, because it must overcome a very violent resistance of the atmosphere; and wherever that resistance is in the smallest degree lessened, there it will undoubtedly strike, and at a very considerable distance too. It is otherwise with that kind which appears in flashes of no determinate form. The electric matter of which these are composed, is evidently dissipated in the air by some conducting substances which are present there; and of consequence, though a man, or other conducting body, happened to be very near such a flash, he would not be struck or materially injured by it, tho' a zig-zag flash, in such circumstances, would have probably discharged its whole force upon him.

The most destructive kind of lightning, however, as we have already observed, is that which assumes the form of balls. These are produced by an exceeding great power of electricity gradually accumulated till the resistance of the atmosphere is no longer able to confine it. In general, the lightning breaks out from the electrified cloud by means of the approach of some conducting substance; either a cloud, or some terrestrial substance: but the fire-balls seem to be formed, not because there is any substance at hand to attract the electric matter from the cloud, but because the electricity is accumulated in such quantity that the cloud itself can no longer contain it. Hence such balls fly off slowly, and have no particular destination. Their appearance indicates a prodigious commotion and accumulation of electricity in the atmosphere, without a proportionable disposition in the earth to receive it. This disposition, however, we know is perpetually altered by a thousand circumstances, and the place which first becomes most capable of admitting electricity will certainly receive a fire-ball. Hence this kind of lightning has been known to move slowly backwards and forwards in the air for a considerable space of time, and then suddenly to fall on one or more houses, according to their being more or less affected with an electricity opposite to that of the ball at the time. It will also run along the ground, break into several parts, and produce several explosions at the same time.

It is very difficult to imitate lightning of this kind in our electrical experiments. The only cases in which



Lightning. it hath been done in any degree are those in which Dr Priestley made the explosion of a battery pass for a considerable way over the surface of raw flesh, water, &c. \* In these cases, if, while the electric flash passed over the surface of the flesh, it had been possible to interrupt the metallic circuit by taking away the chain, the electric matter discharged from the battery would have been precisely in the situation of one of the fire-balls above-mentioned; i. e. it would have been at a loss for a conductor. The negative side of the battery was the place of its destination; but to that it would not have easily got, because of the great quantity of atmosphere which lay in its way, and the incapacity of the neighbouring bodies to receive it. But if, while the electric matter was thus stationary for want of a conductor, if any person standing near, or touching the negative side of the battery, presented a finger to that seemingly inoffensive luminous body, he would instantly be struck very violently; because a free communication being now made by means of his body, the powers by which the electric fluid is impelled from one place to another would instantly urge it upon him. But if we suppose a person, who hath no communication with the battery, to present his finger to the same body, he may perhaps receive a slight spark from it; but not a shock of any consequence, because there is not a perfect communication by means of his body with the place to which the electric fire is destined.

Phenomena of lightning in general accounted for. Hence we may account for the seemingly capricious nature of lightning of all kinds, but especially of that kind which appears in the form of balls. Sometimes it will strike trees, high houses, steeples, and towers, without touching cottages, men, or other animals, who are in the neighbourhood. In such cases, people would be apt to say that the neighbourhood of these higher objects *preferred* the others from the stroke; but with little reason, since low houses, men walking in the fields, cattle, nay, the surface of the earth itself, have all been struck, while high trees and steeples in the neighbourhood have not been touched. In like manner, fire-balls have passed very near certain persons without hurting them, while they have, as it were, gone considerably out of their way to kill others. The reason of all this is, that in thunder-storms there is constantly a certain zone of earth considerably under the surface, which the lightning desires (if we may use the expression) to strike, because it hath an electricity opposite to that of the lightning itself. Those objects, therefore, which form the most perfect conductors between the electrified clouds and that zone of earth, will be struck by the lightning, whether they are high or low; and because we know not the conducting quality of the different terrestrial substances, the superfluous are apt to ascribe strokes of lightning to the Divine vengeance against particular persons, whereas it is certain that this fluid, as well as others, acts according to invariable rules from which it is never known to depart.

Lightning, in the time of severe thunder-storms, is supposed to proceed from the earth, as well as from the clouds: but this fact hath never been well ascertained, and indeed from the nature of the thing it seems very difficult to be ascertained; for the motion of the electric fluid is so very quick, that it is altogether

impossible to determine, by means of our senses, whether it goes from the earth or comes to it. In fact, there are in this country many thunder-storms in which it doth not appear that the lightning touches any part of the earth, and consequently can neither go to it nor come out from it. In these cases, it flashes either from an electrified cloud to one endowed with an opposite electricity, or merely into those parts of the atmosphere which are ready to receive it. But if not only the clouds, but the atmosphere all the way betwixt them and the earth, and likewise for a considerable space above the clouds, are electrified one way, the earth must then be struck. The reason of this will appear from a consideration of the principles laid down under the article ELECTRICITY, sect. vi. It there appears, that the electric fluid is altogether incapable either of *accumulation* or *diminution* in quantity in any particular part of space. What we call *electricity* is only the motion of this fluid made perceptible to our senses. Positive electricity is when the current of electric matter is directed from the electrified body. Negative electricity is when the current is directed towards it. Let us now suppose, that a positively electrified cloud is formed over a certain part of the earth's surface. The electric matter flows out from it first into the atmosphere all round; and while it is doing so, the atmosphere is negatively electrified. In proportion, however, as the electric current pervades greater and greater portions of the atmospheric space, the greater is the resistance to its motion, till at last the air becomes positively electrified as well as the cloud, and then both act together as one body. The surface of the earth then begins to be affected, and it silently receives the electric matter by means of the trees, grass, &c. which grow upon its surface, till at last it becomes positively electrified also, and begins to send off a current of electricity from the surface downwards. The causes which at first produced the electricity of the clouds, (and which are treated of under the article THUNDER), still continuing to act, the power of the electric current becomes inconceivably great. The danger of the thunder-storm now begins; for as the force of the lightning is directed to some place below the surface of the earth, it will certainly dart towards that place, and shatter every thing to pieces which resists its passage. The benefit of conducting-rods will now also be evident: for we are sure that the electric matter will in all cases take the way where it meets with the least resistance; and this is through the substance, or rather over the surface, of metals. In such a case, therefore, if there happen to be a house furnished with a conductor directly below the cloud, and at the same time a zone of negatively electrified earth not very far below the foundation of the house, the conductor will almost certainly be struck, but the building will be unhurt. If the house wants a conductor, the lightning will nevertheless strike in the same place, in order to get at the negatively electrified zone above-mentioned; but the building will now be damaged, because the materials of it cannot readily conduct the electric fluid.

We will now be able to enter into the dispute, Whether the preference is due to knobbed or pointed conductors for preserving buildings from strokes of lightning. Ever since the discovery of the identity of positive and negative electricity, it has been found that pointed conductors are more effective than knobbed ones.

lightning, electricity and lightning, it hath been allowed by all parties, that conductors of some kind are in a manner essentially necessary for the safety of buildings in those countries where thunder-storms are very frequent. The principle on which they act hath been already explained; namely, that the electric fluid, when impelled by any power, always goes to that place where it meets with the least resistance, as all other fluids also do. As metals, therefore, are found to give the least resistance to its passage, it will always choose to run along a metalline rod, in preference to a passage of any other kind. We must, however, carefully consider a circumstance which seems to have been too much overlooked by electricians in their reasonings concerning the effects of thunder-rods; namely, That lightning, or electricity, never strikes a body, merely for the sake of the body itself, but only because by means of that body it can readily arrive at the place of its destination. When a quantity of electricity is collected from the earth, by means of an electric machine, a body communicating with the earth will receive a strong spark from the prime conductor. The body receives this spark, not because it is itself capable of containing all the electricity of the conductor and cylinder, but because the natural situation of the fluid being disturbed by the motion of the machine, a stream of it is sent off from the earth. The natural powers, therefore, make an effort to supply what is thus drained off from the earth; and as the individual quantity which comes out is most proper for supplying the deficiency, as not being employed in any natural purpose, there is always an effort made for returning it to the earth. No sooner, then, is a conducting body, communicating with the earth, presented to the electrical machine, than the whole effort of the electricity is directed against that body, not merely because it is a conductor, but because it leads to the place where the fluid is directed by the natural powers by which it is governed, and at which it would find other means to arrive, though that body were not to be presented. That this is the case, we may very easily satisfy ourselves, by presenting the very same conducting substance in an insulated state to the prime conductor of the machine; for then we shall find, that only a very small spark will be produced. In like manner, when lightning strikes a tree, a house, or a thunder-rod, it is not because these objects are high, or in the neighbourhood of the cloud; but because they communicate with some place below the surface of the ground, against which the impetus of the lightning is directed; and at that place the lightning would certainly arrive, though none of the above-mentioned objects had been interposed.

The fallacy of that kind of reasoning generally employed concerning the use of thunder-rods, will now be sufficiently apparent. Because a point presented to an electrified body in our experiments, always draws off the electricity in a silent manner; therefore Dr Franklin and his followers have concluded, that a pointed conductor will do the same thing to a thunder-cloud, and thus effectually prevent any kind of danger from a stroke of lightning. Their reasoning on this subject, they think, is confirmed by the following fact among many others. " Dr Franklin's house at Philadelphia was furnished with a rod extending nine feet above the

top of the chimney. To this rod was connected a Lightning-wire of the thickness of a goose-quill, which descended through the well of the stair-case; where an interruption was made, so that the ends of the wire, to each of which a little bell was fixed, were distant from each other about six inches; an insulated brass ball hanging between the two bells. The author was one night waked by loud cracks, proceeding from his apparatus in the stair-case. He perceived, that the brass ball, instead of vibrating as usual between the bells, was repelled and kept at a distance from both; while the fire sometimes passed in very large quick cracks directly from bell to bell; and sometimes in a continued dense white stream, seemingly as large as his finger; by means of which the whole stair-case was enlightened, as with sunshine, so that he could see to pick up a pin.—From the apparent quantity of electric matter of which the cloud was thus evidently robbed, by means of the pointed rod (and of which a blunt conductor would not have deprived it), the author conceives, that a number of such conductors must considerably lessen the quantity of electric fluid contained in any approaching cloud, before it comes so near as to deliver its contents in a general stroke."

For this very reason, Mr Benjamin Wilson and his followers, who constitute the opposite party, have determined that the use of pointed conductors is utterly unsafe. They say, that in violent thunder-storms the whole atmosphere is full of electricity; and that attempts to exhaust the vast quantity there collected, are like attempting to clear away an inundation with a shovel, or to exhaust the atmosphere with a pair of bellows. They maintain, that though pointed bodies will effectually prevent the accumulation of electricity in any substance; yet if a non-electrified body is interposed between a point and the conductor of an electrical machine, the point will be struck at the same moment with the non-electrified body, and at a much greater distance than that at which a knob would be struck. They affirm also, that, by means of this silent solicitation of the lightning, inflammable bodies, such as gun-powder, tinder, and Kunckel's phosphorus, may be set on fire; and for these last facts they bring decisive experiments. From all this, say they, it is evident that the use of pointed conductors is unsafe. They solicit a discharge to the place where they are; and as they are unable to conduct the whole electricity in the atmosphere, it is impossible for us to know whether the discharge they solicit may not be too great for our conductor to bear; and consequently all the mischiefs arising from thunder-storms may be expected, with this additional and mortifying circumstance, that this very conductor hath probably solicited the fatal stroke, when without it the cloud might have passed harmless over our heads without striking at all.

Here the reasoning of both parties is equally wrong. They both proceed on this erroneous principle, that in thunder-storms the conductor will always solicit a discharge, or that at such times all the elevated objects on the surface of the earth are drawing off the electricity of the atmosphere: but this cannot be the case, unless the electricity of the earth and of the atmosphere is of a different kind. Now, it is demonstrable, that until this difference between the electricity of the atmosphere and of the surface of the earth ceases, there cannot

Lightning cannot be a thunder-storm. When the atmosphere begins to be electrified either positively or negatively, the earth, by means of the inequalities and moisture of its surface, but especially by the vegetables which grow upon it, absorbs that electricity, and quickly becomes electrified in the same manner with the atmosphere. This absorption, however, ceases in a very short time, because it cannot be continued without setting in motion the whole of the electric matter contained in the earth itself. Alternate zones of positive and negative electricity will then begin to take place below the surface of the earth, for the reasons mentioned under the article ELECTRICITY, sect. vi. § 9. Between the atmosphere and one of these zones, the stroke of the lightning always will be. Thus, supposing the atmosphere is positively electrified, the surface of the earth will, by means of trees, &c. quickly become positively electrified also; we shall suppose to the depth of 10 feet. The electricity cannot penetrate farther on account of the resistance of the electric matter in the bowels of the earth. At the depth of 10 feet from the surface, therefore, a zone of negatively-electrified earth begins, and to this zone the electricity of the atmosphere is attracted; but to this it cannot get, without breaking through the positively-electrified zone which lies uppermost, and shattering to pieces every bad conductor which comes in its way. We are very sure, therefore, that in whatever places the outer-zone of positively-electrified earth is thinnest, the lightning will strike whether a conductor happens to be present or not. If there is a conductor, either knobbed or sharp-pointed, the lightning will indeed infallibly strike it: but it would also have struck a house situated on that spot without any conductor; and though the house had not been there, it would have struck the surface of the ground itself.—Again, if we suppose the house with its conductor to stand on a part of the ground where the positively-electrified zone is very thick, the conductor will neither silently draw off the electricity, nor will the lightning strike it, though perhaps it may strike a much lower object, or even the surface of the ground itself, at no great distance; the reason of which undoubtedly is, that there the zone of positively-electrified earth is thinner, than where the conductor was.

We must also observe, that the Franklinians make their pointed conductors to be of too great consequence. To the houses on which they are fixed, no doubt, their importance is very great: but in exhausting a thunder-cloud of its electricity, their use must appear trifling; and to insist on it, ridiculous. Innumerable objects, as trees, grass, &c. are all conspiring to draw off the electricity, as well as the conductor, if it could be drawn off; but of effecting this there is an impossibility, because they have the same kind of electricity with the clouds themselves. The conductor hath not even the power of *attracting* the lightning a few feet out of the direction which it would choose of itself. Of this we have a most remarkable and decisive instance, in what happened to the magazine at Purfleet in Essex, on May 15, 1777. That house was furnished with a pointed conductor, raised above the highest part of the building; nevertheless, about six in the evening of the abovementioned day, a flash of lightning struck an iron cramp in the corner of the wall, considerably

lower than the top of the conductor, and only 46 feet in a sloping line distant from the point.—This produced a long dispute with Mr Wilson concerning the propriety of using pointed conductors; and, by the favour of his majesty, he was enabled to construct a more magnificent electrical apparatus than any private person could be supposed to erect at his own expence, and of which some account is given under the article ELECTRICITY, n° 78. The only new experiments, however, which this apparatus produced, were, the firing of gunpowder by the electric *aura*, as it is called; and a particularly violent shock which a person received when he held a small pointed wire in his hand, upon which the conductor was discharged. We must observe, that the electrified surface of the conductor was 620 feet; and we can have but little idea of the strength of sparks from a conductor of this magnitude, supposing it properly electrified. Six turns of the wheel made the discharge felt through the whole body like the strong shock of a Leyden vial; and nobody chose to make the experiment when the conductor had received a higher charge. A very strong shock was felt, as already observed, when this conductor was discharged upon a pointed wire held in a person's hand, even though the wire communicated with the earth; which was not felt, or but very little, when a knobbed wire was made use of.—To account for this difference may, perhaps, puzzle electricians; but with regard to the use of blunt or pointed thunder-rods, both experiments seem quite inconclusive. Though a very great quantity of electric matter silently drawn off will fire gunpowder, this only proves that a pointed conductor ought not to pass through a barrel of gunpowder; and if a person holding a pointed wire in his hand received a strong shock from Mr Wilson's great conductor, it can thence only be inferred, that in the time of thunder nobody ought to hold the conductor in their hands; both which precautions common-sense would dictate without any experiment. From the accident at Purfleet, however, the disputants on both sides ought to have seen, that, with regard to lightning, neither points nor knobs can *attract*. Mr Wilson surely had no reason to condemn the pointed conductor for *soliciting* the flash of lightning, seeing it did not strike the point of the conductor, but a blunt cramp of iron; neither have the Franklinians any reason to boast of its effect in *silently drawing off* the electric matter, since all its powers were neither able to prevent the flash, nor to turn it 46 feet out of its way. The matter of fact is, the lightning was determined to enter the earth at the place where the board-house stands, or near it. The conductor fixed on the house offered the easiest communication: but 46 feet of air intervening between the point of the conductor and the place of explosion, the resistance was less through the blunt cramp of iron, and a few bricks moistened with rain-water, to the side of the metalline conductor, than through the 46 feet of air to its point; for the former was the way in which the lightning actually passed.

Mr Wilson and his followers seem also mistaken in supposing that a pointed conductor can solicit a greater discharge than what would otherwise happen. Allowing the quantity of electricity in the atmosphere during the time of a thunder-storm to be as great



great as they please to suppose; nevertheless, it is impossible that the air can part with all its electricity at once, on account of the difficulty with which the fluid moves in it. A pointed conductor, therefore, if it does any thing at all, can only solicit the partial discharge which is to be made at any rate; and if none were to be made though the conductor was absent, its presence will not be able to effect any.

In a late publication on the subject of electricity by lord Mahon, we find a new kind of lightning made mention of, which he is of opinion may give a fatal stroke, even though the main explosion was at a considerable distance; a mile, for instance, or more. This he calls the *electrical returning stroke*; and exemplifies it in the following manner, from some experiments made with a very powerful electrical machine, the prime conductor of which (six feet long, by one foot diameter) would generally, when the weather was favourable, strike into a brass ball connected with the earth, to the distance of 18 inches, or more. In the following account this brass ball, which we shall call *A*, is supposed to be constantly placed at the *striking distance*; so that the prime conductor, the instant that it becomes fully charged, explodes into it.

Another large conductor, which we shall call the *second conductor*, is suspended, in a perfectly insulated state, farther from the prime conductor than the *striking distance*, but within its *electrical atmosphere*;—at the distance of six feet, for instance. A person standing on an insulating stool touches this *second conductor* very lightly with a finger of his right hand; while, with a finger of his left hand, he communicates with the earth, by touching very lightly a second brass ball fixed at the top of a metallic stand, on the floor, and which we shall call *B*.

While the prime conductor is receiving its electricity, sparks pass (at least if the distance between the two conductors is not too great) from the second conductor to the insulated person's right hand; while similar and simultaneous sparks pass out from the finger of his left hand into the second metallic ball *B*, communicating with the earth. These sparks are part of the *natural quantity* of electric matter belonging to the second conductor, and to the insulated person; driven from them into the earth, through the ball *B*, and its stand, by the elastic pressure or action of the electrical atmosphere of the prime conductor. The second conductor and the insulated person are hereby reduced to a *negative state*.

At length, however, the prime conductor, having acquired its *full charge*, suddenly strikes into the ball *A*, of the first metallic stand, placed for that purpose at the *striking distance* of 17 or 18 inches. The explosion being made, and the prime conductor suddenly robbed of its electric atmosphere, its pressure or action on the second conductor, and on the insulated person, as suddenly ceases; and the latter instantly feels a smart *returning stroke*, though he has no direct or visible communication (except by the floor) either with the *striking or struck body*, and is placed at the distance of five or six feet from both of them. This returning stroke is evidently occasioned by the sudden re-entrance of the electric fire *naturally* belonging to his body and to the second conductor, which had before been expelled from them by the action of the charged prime conductor

upon them; and which returns to its former place, <sup>Lightning</sup> the instant that action or elastic pressure ceases. The author shows, that there can be no reason to suppose that the electrical discharge from the prime conductor should, in this experiment, *divide itself* at the instant of the explosion, and go different ways, so as to strike the second conductor and insulated person in this manner, and at such a distance from it.

When the second conductor and the insulated person are placed in the *densest* part of the electrical atmosphere of the prime conductor, or *just beyond* the striking distance, the effects are still more considerable; the *returning stroke* being extremely severe and pungent, and appearing considerably sharper than even the *main stroke* itself, received directly from the prime conductor. This circumstance the author alleges as an unanswerable proof that the effect which he calls the *returning stroke*, was not produced by the *main stroke* being any wise divided at the time of the explosion, since no effect can ever be greater than the cause by which it is immediately produced.—Having taken the *returning stroke* eight or ten times one morning, he felt a considerable degree of pain across his chest during the whole evening, and a disagreeable sensation in his arms and wrists all the next day.

We come now to the application of this experiment, and of the doctrine deduced from it, to what passes in *natural electricity*, or during a thunder-storm; in which there is reason to expect similar effects, but on a larger scale:—a scale so large indeed, according to the author's representation, that persons and animals may be destroyed, and particular parts of buildings may be considerably damaged, by an electrical *returning stroke*, occasioned even by some very distant explosion from a thunder-cloud;—possibly at the distance of a mile or more.

It is certainly easy to conceive, that a charged extensive thunder-cloud must be productive of effects similar to those produced by the author's prime conductor. Like it, while it continues charged, it will, by the *superinduced elastic electrical pressure* of its atmosphere—to use the author's own expression—drive into the earth a part of the electric fluid *naturally* belonging to the bodies which are within the reach of its *widely extended* atmosphere; and which will therefore become *negatively* electrical. This portion too of their electric fire, as in the artificial experiments, will, on the explosion of the cloud, at a distance, and the cessation of its action upon them, suddenly return to them; so as to produce an equilibrium, and restore them to their *natural state*.

To this theory, the authors of the Monthly Review <sup>12</sup> have given the following answer: “We cannot, how-<sup>ever</sup> the Reviewers agree with the ingenious author, with respect to the *greatness* of the effects, or of the danger to be apprehended from the *returning stroke* in this case; as we think his estimate is grounded on an erroneous foundation.—Since (says he) the density of the electrical atmosphere of a thunder-cloud is so immense, when compared to the electrical density of the electrical atmosphere of any prime conductor, charged by means of any electrical apparatus whatsoever; and since a *returning stroke*, when produced by the sudden removal of even the *weak* elastic electrical pressure of the electrical atmosphere of a charged prime conductor, may be extremely strong, as

we have seen above; it is *mathematically evident*, that, when a *returning stroke* comes to be produced by the sudden removal of the very strong elastic electrical pressure of the electrical atmosphere of a thunder-cloud powerfully charged; the strength of such a *returning stroke* must be enormous.

"If indeed the quantity of electric fluid *naturally* contained in the body of a man, for instance, were immense, or indefinite, the author's estimate between the effects producible by a cloud, and those caused by a prime conductor, might be admitted. But surely an electrified cloud,—how great soever may be its extent, and the height of its charge, when compared with the extent and charge of a prime conductor—cannot expel from a man's body (or any other body) *more* than the *natural* quantity of electricity which it contains. On the sudden removal, therefore, of the pressure by which this natural quantity had been expelled, in consequence of the explosion of the cloud into the earth; *no more* (at the utmost) than his *whole natural stock* of electricity can re-enter his body (c). But we have no reason to suppose that this quantity is so great, as that its sudden re-entrance into his body should destroy or even injure him.

"In the experiment above described, the insulated person receives into his body, at the instant of the *returning stroke*, not only all that portion of his own natural electric fire which had been expelled from it; but likewise transmits through it, at the same instant, *in consequence of his peculiar situation*, all the electric fire of which the large second conductor had been robbed; and which must necessarily re-pass through his body, to arrive at that conductor. To render the case somewhat parallel, in *natural electricity*, the man's body must be so peculiarly circumstanced, supposing him to be in a house, that the electric matter which has been expelled from the house into the earth, by the pressure of an extensive thunder-cloud, could not return back into the building, on the explosion of the cloud at a distance, without passing through his body: a case not likely to happen, unless the house were insulated (like the second conductor in the preceding experiment), and his body became the channel through which alone the house could have its electric matter restored to it: it appears much more probable that the electric matter returns to the house through the *same channels* by which it before insensibly passed out, and with equal silence, tho' more suddenly.

"In the case of a man who is abroad, and in an open field, during the time of an explosion;—as he is unconnected with other masses of matter *above him*, no more than the precise quantity of electric fire, which had been before expelled from his body, will suddenly return into it at the instant of a distant explosion: and that this quantity is not usually very large, may be inferred from many considerations.

(c) "We suppose the person not to be so situated, that the *returning fire* of other bodies must necessarily pass through his body."

(d) "The author does indeed produce a *living evidence*, in the case of a person at Vienna, who, he has been credibly informed, received an electrical shock, by having held one hand accidentally in contact with an *interrupted* metallic conducting rod, at the instant that a thunder-cloud exploded at the distance, as was conjectured, of above half an English mile. He likewise observes, that a 'very strong, bright, and sudden stroke' (or spark) of electrical fire has been seen, by several electricians, to pass in the interval, or interruption, purposely left in the conducting rod of a house at the instant of a distant explosion; and 'when it was fully proved, by the sharp point of the conductor not being melted, or even tinged,' that the conductor itself had not been struck.—These observations, however, do not by any means prove the *magnitude*, or *danger*, of the returning stroke, but merely its *existence*: which we do not contest."

"When a person standing on the ground holds a pair of Mr Canton's balls in his hand, while a highly charged thunder-cloud is suspended over his head; the angle made by the balls indicates the *electrical state* of that person, or the quantity of *natural* electricity of which his body is at that time deprived, by the action of the (*positively*) charged cloud hanging over him. But we have never seen the repulsion of the balls so considerable, as to furnish any just apprehensions that the return of his natural electric matter, however sudden, could be attended with injury to him: nor would he be sensible of any commotion on the balls suddenly coming together; tho' a spark might undoubtedly be perceived, at that instant, were he insulated, and placed in the same manner with the author when he tried the above-related experiment.

"The author nevertheless observes, that 'there have been instances of persons who have been killed by *natural* electricity, having been found with their shoes torn, and with their feet damaged by the electrical fire; but who have not had, over their whole body, any other apparent marks of having been struck with lightning.' He adds, 'if a man walking out of doors were to be killed by a *returning stroke*, the electrical fire would rush into that man's body thro' his feet, and his feet only; which would not be the case, were he to be killed by any *main stroke* of explosion, either positive or negative.'

"It would be no difficult task, we think, to account for these appearances in a different manner; were all the circumstances attending the case minutely ascertained: but without interrogating the *dead* on this subject, we may more satisfactorily appeal to the experience of the *living* (d), to shew, that though the *returning stroke* must take place, in all thunder-storms, *in some degree or other*; yet it is not of that alarming magnitude which the author ascribes to it. If, in any particular thunder-storm, a man in the open fields could be killed, at the instant of a distant explosion, merely by the return of his *own* electric fire, which had before been driven out of his body; surely numerous observations of persons who had experienced the *returning stroke*, in *slighter* degrees, would be familiar; and scarce a great thunder-storm must have occurred, in which one person or another must not, at the instant of an explosion, have felt the effects of the *returning stroke*, in *some degree or other*—from that of a violent concussion, to that of a slight and almost imperceptible pulsation. But no observations of this kind are known to us; nor have we ever heard of any person's experiencing any kind of electrical commotion in a thunder-storm, except such as have either been directly struck, or have happened to be in the *very near neighbourhood* of the spot where the explosion took place.

"The author has been aware of this objection, which

lightning, which he proposes, and endeavours to remove: but his answer to it amounts to little more than what has been already quoted from him; that is, to a simple estimate of the enormous difference between the electrical density, or the *elastic electrical pressure*, of the atmosphere of an extensive *thunder-cloud*, and that of a charged *prime conductor*. We have already observed, that this is not the proper method of estimating their different effects, when these two causes, how unequal soever in power, are considered as exerting that power on bodies containing a *limited*, and comparatively *small*, quantity of electric matter.

"We have been induced to discuss this subject thus particularly, with a view to quiet the minds of the timorous; as the author's extension of his principles, respecting the returning stroke in *artificial* electricity, to what passes in *natural* electricity, holds out a new, and, in our opinion, groundless subject of terror to those who, in the midst of their apprehensions, have hitherto only dreaded the effects of a thunder-storm when it made near approaches to them; but who, if this doctrine were believed, would never think themselves in security while a thunder-cloud appeared in sight, unless sheltered in a house furnished with proper conductors:—for we should not omit to remark, that a subsequent observation tends to diminish their fears, by shewing that *high* and *pointed* conductors tend to secure both persons and buildings, against the various effects of any *returning stroke* whatever, as well as of the *main stroke*.

"Indeed various parts of this work, besides those immediately appropriated to the subject, tend to prove the utility of *high* and *pointed* conductors, in preference to those which terminate in a *ball*, or *rounded end*. Towards the end of the performance, the author discusses this matter very particularly; and enumerates the '*necessary requisites*' in erecting them, in number 11; to every one of which, tho' we have taken the liberty to differ from him on another subject, we readily subscribe. As this matter is of a popular nature, and on a subject generally interesting, we shall transcribe this list; adding a short explanation to particular articles.—These requisites (says the author) are 11 in number:

1st, That the rod be made of such substances, as are, in their nature, the *best conductors* of electricity.

2dly, That the rod be *uninterrupted*, and *perfectly continuous*.—This is a very material circumstance. One entire piece of metal cannot perhaps be had: but it is not sufficient that the rods, of which the conductor consists, be *sensibly* in contact; they should be pressed into *actual* contact by means of nuts and screws, with a thin piece of sheet-lead between the shoulders of the joints.

3dly, That it be of a *sufficient thickness*.—A copper rod half an inch square, or an iron rod one inch square, or one of lead two inches square, are thought fully sufficient by the author.

4thly, That it be perfectly connected with the common stock.—That is, it should be carried deep into the earth, which is frequently dry near the surface; and then continued in a horizontal direction, so as to have the farther extremity dipped, should this be practicable, into water, at the distance of 30 yards or more from the foundation.

5thly, That the upper extremity of the rod be as *lightning*, *acutely pointed* as possible.—This termination should be of copper; or rather a very fine and exceedingly acute needle of *gold* should be employed, which will not materially add to the expense.

6thly, That it be very finely tapered:—so that the upper extremity may be a cone, the diameter of the base of which may bear an extremely small proportion to its height; for instance, that of *one* to *forty*.

7thly, That it be extremely prominent:—that is, 8, 10, or 15 feet at least above the highest parts of the building. The author lays great stress on this circumstance; in consequence of the law above-mentioned, deduced by him from his experiments, relating to electric atmospheres. According to this law, the density of an electric atmosphere (the *negative* atmosphere, for instance, of the roof of a house, &c. while a *positively* charged cloud hangs over it) diminishes in the inverse ratio of the *square* of the distance from the surface of the body to which that atmosphere belongs. Accordingly, if the rod project 12 feet into this atmosphere, it will reach to a part of it *four* times less dense than if the rod projected only to *half* that distance, or six feet;—and to a part *one hundred and forty* four times rarer, than if it projected only *one foot*.

8thly, That each rod be carried, in the shortest convenient direction, from the point at its upper end, to the common stock.

9thly, That there be neither large nor prominent bodies of metal upon the top of the building proposed to be secured, but such as are connected with the conductor, by some proper metallic communication."

10thly, That there be a *sufficient number* of high and pointed rods.—On edifices of great importance, especially magazines of gun-powder, the author thinks these ought never to be above 40 or 50 feet asunder.

11thly, That every part of the rods be very substantially erected.

"The author declares that he has never been able to hear of a *single* instance, nor does he believe that any can be produced, of an *high*, *tapering*, and *acutely pointed* metallic conductor, having ever, in any country, been struck by lightning; if it had *all* the necessary requisites above-mentioned, especially the second and fourth."

On the whole, it seems to be pretty certain, that both pointed and knobbed metalline conductors <sup>13</sup> both have the power of preferring any body placed at a small distance from them from being struck by lightning. This they do, not because they can *attract* the lightning far out of its way, but because the resistance to its passage is always least on that side where they are; and as pointed conductors diminish the resistance more considerably than blunt ones, they seem in all cases to be preferable.—It appears, however, that a single conductor, whether blunt or pointed, is not capable of securing all the parts of a large building from strokes of lightning; and therefore several of them will be required for this purpose: but to what distance their influence extends, hath not been determined, nor does it seem easily capable of being ascertained.

It now remains only to explain some of the more <sup>15</sup> uncommon appearances and effects of lightning. One thing some of these is, that it is frequently observed to kill at times kill ternately: that is, supposing a number of people <sup>alternately</sup> standing



Lightning.

standing in a line; if the first person was killed, the second perhaps would be safe; the third would be killed, and the fourth safe; the fifth killed, &c.—Effects of this kind are generally produced by the most violent kind of lightning; namely, that which appears in the form of balls, and which are frequently seen to divide themselves into several parts before they strike. If one of these parts of a fire-ball strikes a man, another will not strike the person who stands immediately close to him; because there is always a repulsion between bodies electrified the same way. Now, as all these parts into which the ball breaks have all the same kind of electricity, it is evident that they must for that reason repel one another; and this repulsion is so strong, that a man may be interposed within the stroke of two of them, without being hurt by either.

16  
Why it  
sometimes  
marks bod-  
ies with  
the form of  
a cross.

The other effect of lightning is mentioned under the article JERUSALEM, where those who attempted to rebuild the temple had the marks of crosses impressed upon their garments and bodies. This may reasonably be thought to arise from the same cause to which the angular appearance of lightning in the air is owing, namely, its violent impetus and velocity, together with the opposition of the atmosphere. A small stroke of lightning, sometimes indeed a very considerable one, cannot always enter the substance of terrestrial bodies, even when it touches them, for reasons already given. In this case it runs along their surface, and, as in its motion it is perpetually resisted by the atmosphere, it undoubtedly has the same angular motion which we often perceive in the atmosphere. If in this situation it happens to touch the human skin, or a garment, especially of linen, as being a conductor, it will undoubtedly leave a mark upon it; and this mark being of a zig-zag form, might, in the above instance, have been either taken for the exact form of a cross by the beholders, or have suggested that idea in relating the story to make it appear more wonderful.

These observations may serve to give some idea of the nature of lightning, and its operations after it appears in its proper form and bursts out from the cloud; but for an account of its original formation, and of the powers by which the clouds are at first electrified, and their electricity kept up notwithstanding many successive discharges of lightning, and the quantity of electric matter continually carried off by the rain, &c. see the article THUNDER.

*Artificial LIGHTNING.* Before the discoveries of Dr Franklin concerning the identity of electricity and lightning, many contrivances were invented in order to represent this terrifying phenomenon in miniature: the combustions of phosphorus in warm weather, the ascension of the vapour of spirit of wine evaporated in a close place, &c. were used in order to support the hypothesis which at that time prevailed; namely, that lightning was formed of some sulphureous, nitrous, or other combustible vapours, floating in long trains in the atmosphere, which by some unaccountable means took fire, and produced all the destructive effects of that phenomenon. These representations, however, are now no more exhibited; and the only true artificial lightning is universally acknowledged to be the discharge of electric matter from bodies in which it is artificially set in motion by our machines.

Lightfoot

Ligulicium

*LIGHTFOOT* (John), a very learned English divine in the 17th century, was educated in Christchurch, Cambridge. Sir Rowland Cotton, knight, took him into his family as his chaplain, and engaged him in the study of the Hebrew language. He resolved to travel; but changed his resolution, being importuned by the people of Stone in Staffordshire to be their minister. From hence he removed to Hornsey near London, for the sake of Sion-college library, where he discharged the duties of his function, and prosecuted his rabbinical studies, till June 1642, when he retired to London, was chosen minister of St Bartholomew's behind the Exchange, and appointed one of the assembly of divines in 1643. August 26, 1645, he preached, before the house of commons, a sermon printed at London the same year, in which he recommends to the parliament a *Review and Survey* of the translation of the bible, and to hasten the settling of the church. In 1655, he was chosen vice-chancellor of the university of Cambridge. He was collated to a prebend in the cathedral of Ely by Sir Orlando Bridgeman, then keeper of the great seal. He published several valuable works, particularly "The Harmony of the Old, and the Harmony of the New Testament," &c. He died in 1675, aged 74.

*LIGNICENSIS TERRA*, in the materia medica, the name of a fine yellow bole dug in many parts of Germany, particularly about Emeric in the circle of Westphalia, and used in cordial and astringent compositions.

*LIGNUM COLUBRINUM.* See OPHIORHIZA.  
*LIGULATED*, among botanists, an appellation given to such stamules as have a straight end turned downwards, with three indentures, but not separated into segments.

*LIGURIA* (anc. geog.), a country of Italy, bounded on the south by the Mediterranean sea, on the north by the Appennine mountains, on the west by part of Transalpine Gaul, and on the east by Etruria. There is a great disagreement among authors concerning the origin of the Ligurians, though most probably they were descended from the Gauls. Some carry up their origin as far as the fabulous heroes of antiquity; while others trace them from the Ligyes, a people mentioned by Herodotus as attending Xerxes in his expeditions against Greece. These Ligyes are by some ancient geographers placed in Colchis; by others, in Albania.—According to Diodorus Siculus, the Ligurians led a very wretched life; their country being entirely overgrown with woods, which they were obliged to pull up by the root, in order to cultivate their land, which was also encumbered with great stones, and, being naturally barren, made but very poor returns for all their labour. They were much addicted to hunting; and, by a life of continual exercise and labour, became so strong, that the weakest Ligurian was generally an overmatch for the strongest and most robust among the Gauls. The women are said to have been almost as strong as the men, and to have borne an equal share in all laborious enterprises. With all their bravery, however, they were not able to resist the Roman power; but were subdued by that warlike nation, about 211 B. C.

*LIGUSTICUM*, *LOVAGE*, a genus of the digynia order, belonging to the pentandria class of plants. There are six species, of which the most remarkable

are,

*antrum*,  
*guac.* are, the levidicum or common, and the scoticum or Scots, lovage. The first is a native of the Apennine mountains in Italy. It hath a thick-fleshy, deeply-penetrating perennial root, crowned by very large, many-parted, radical leaves, with broad lobes, having incisions at top, upright, strong, channelled stalks, branching six or seven feet high, and all the branches terminated by yellow flowers in large umbels. The second is a native of Scotland, and grows near the sea in various parts of the country. It hath a thickish, fleshy, penetrating, perennial root, crowned by large doubly-trifoliate leaves, with broad, short, indented lobes, upright, round stalks, half a yard high; terminated by small yellow umbels. Both species are hardy, and easily propagated by seeds sown in spring or autumn.

*Medicinal uses, &c.* The root of the first species agrees nearly in quality with that of angelica: the principal difference is, that the lovage root hath a stronger smell, and a somewhat less pungent taste, accompanied with a more durable sweetness, the seeds being rather warmer than the root; but though certainly capable of being applied to useful purposes, this root is not regarded in the present practice. The leaves of the second are sometimes eaten raw as a salad, or boiled as greens, by the inhabitants of the Hebrides. The root is reckoned a good carminative. They give an infusion of the leaves in whey to their calves to purge them.

**LIGUSTRUM**, *PRIVET*; a genus of the monogynia order, belonging to the diandria class of plants. — There is but one species; of which there are two varieties, the deciduous and the evergreen. They are hardy plants, rising from 10 to 15 feet high, adorned with oblong entire leaves, and spikes of infundibuliform oblong white flowers succeeded by black-berries. They are easily propagated by seed, layers, suckers, or cuttings. They are used for making hedges. The purple colour upon cards is prepared from the berries. With the addition of alum, these berries are said to dye wool and silk of a good and durable green; for which purpose they must be gathered as soon as they are ripe. The leaves are bitter and slightly astringent. Oxen, goats, and sheep, eat the plant; horses refuse it.

**LILBURNE** (John), an enthusiastic demagogue, who was tyrannically punished by the star-chamber court, being put in the pillory, whipped, fined and imprisoned, for importing and publishing seditious pamphlets, which he had got printed in Holland; they chiefly reflected on the church of England and its bishops: he suffered in 1637, and in prison was doubly loaded with irons. In 1641, he was released by the long parliament; and from this time, he had the address to make himself formidable to all parties, by his bold, aspiring genius. He signalized himself in the parliament army; and was at one time the secret friend and confidant of Cromwell, and at another his avowed enemy and accuser; so that, in 1650, Cromwell found it to be his interest to silence him, by a grant of some forfeited estates. But after this, he grew outrageous against the protector's government; became chief of the levellers; and was twice tried for high treason, but acquitted by the juries. The last was for returning from exile (having

been banished by the parliament) without a pass. He died in 1657, aged 88.

**LILIACEOUS**, in botany, an appellation given to such flowers as resemble those of the lily.

**LILIUM**, the *LILY*; a genus of the monogynia order, belonging to the hexandria class of plants. There are nine species, all of them bulbous-rooted, herbaceous, flowery perennials, rising with erect annual stalks three or four feet high, garnished with long narrow leaves, and terminated by fine clusters of large, bell-shaped, hexapetalous flowers of exceeding great beauty, of white, red, scarlet, orange, purple, and yellow colours.

*Culture.* All the species are propagated by sowing the seeds; and if care is taken to preserve these seeds from good flowers, very beautiful varieties are often produced. The manner of sowing them is as follows. Some square boxes should be procured, about six inches deep, with holes bored in the bottoms to let out the wet; these must be filled with fresh, light, sandy earth; and the seeds sown upon them pretty thick in the beginning of August, and covered over about half an inch deep with light sifted earth of the same kind. They should then be placed where they may have the morning sun; and if the weather proves dry, they must be watered at times, and the weeds carefully picked out. In the month of October the boxes are to be removed to a place where they may have as much sun as possible, and be secured from the north and north-east winds. In spring the young plants will appear, and the boxes are then to be removed into their former situation. In August the smallest roots are to be emptied out of these boxes, and sowed over a bed of light earth, and covered with about half an inch depth of earth of the same kind sifted over them. Here they must be watered, and shaded at times, and defended from the severity of winter by a slight covering of straw or pease-haulm in the hardest weather. In February, the surface of the bed should be cleared, and a little light earth sifted over it. When the leaves are decayed, the earth should be a little stirred over the roots, and in the month of September following some more earth sifted on. In the September of the following year, the roots must be transplanted to the places where they are to remain, and set at the distance of eight inches; the roots being placed four inches below the surface: this should be done in moist weather. They will now require the same care as in the preceding winters; and the second year after they are transplanted, the strongest roots will begin to flower. The fine ones should then be removed at the proper season into flower-beds, and planted at great distances from one another that they may flower strong.

*Medical uses.* The roots of the white lily are emollient, maturating, and greatly suppurative. They are used externally in cataplasms for these purposes with success. The common form of applying them is boiled and bruised; but some prefer the roasting them till tender, and then beating them to a paste with oil, in which form they are said to be excellent against burns. Gerard recommends them internally against dropsies.

**LILLO** (George), an excellent dramatic writer, born at London in 1693. He was a jeweller by profession, and followed his business for many years in

Lilly.

that neighbourhood with the fairest reputation. He wrote several dramatic pieces, which with his life were lately collected in two volumes 12mo. He died in 1739.

LILLY (John), a dramatic poet, was born in the wilds of Kent, about the year 1553, and educated in Magdalen-college, Oxford, where he took the degree of bachelor of arts in 1573, and that of master in 1575. From Oxford he removed to Cambridge; but how long he continued there, is uncertain. On his arrival in London, he became acquainted with some of queen Elizabeth's courtiers, by whom he was cherished, and admired as a poet and a wit; and her majesty, on particular festivals, honoured his dramatic pieces with her presence. His plays are nine in number. His first publication, however, printed in 1580, was a romance called *Euphues*, which was universally read and admired. This romance, which Blount, the editor of six of his plays, says introduced a new language, especially among the ladies, is, according to Berkenhout, in fact a most contemptible piece of affectation and nonsense: nevertheless it seems very certain, that it was in high estimation by the women of fashion of those times, who, we are told by Whalley the editor of Ben Jonson's works, had all the phrases by heart; and those who did not speak *Euphuism* were as little regarded at court as if they could not speak French. "He was," says Oldys, "a man of great reading, good memory, ready faculty of application, and uncommon eloquence; but he ran into a vast excess of allusion." When or where he died, is not known. Anthony Wood says he was living in 1597, when his last comedy was published. After attending the court of queen Elizabeth thirteen years, notwithstanding his reputation as an author, he was under a necessity of petitioning the queen for some small stipend to support him in his old age. His two letters or petitions to her majesty, on this subject, are preserved in manuscript.

LILLY (William), a noted English astrologer, born in Leicestershire in 1602; where his father not being able to give him more learning than common writing and arithmetick, he resolved to seek his fortune in London. He arrived in 1620, and lived four years as servant to a mantua-maker in the parish of St Clements Dunes; but then moved a step higher to the service of Mr Wright, master of the Salter's company, in the Strand, who not being able to write, Lilly among other offices kept his books. In 1627, when his master died, he paid his addresses to the widow, whom he married with a fortune of 1000l. Being now his own master, he followed the puritanical preachers; and, turning his mind to judicial astrology, became pupil to one Evans, a profligate Welch parson, in that pretended art. Getting a MS. of the *Ars notitia* of Corn. Agrippa, with alterations, he drank in the doctrine of the magic circle, and the invocation of spirits, with great eagerness. He was the author of the *Merlinus Anglicus junior*; *The Supernatural Sight*; and *The White King's Prophecy*. In him we have an instance of the general superstition and ignorance that prevailed in the time of the civil war between Char. I. and his parliament: for the king consulted this astrologer, to know in what quarter he should conceal himself, if he could escape from Hampton-court; and

general Fairfax, on the other side, sent for him to his army, to ask him if he could tell by his art, whether God was with them and their cause? Lilly, who made his fortune by favourable predictions to both parties, assured the general, that God would be with him and his army. In 1648, he published his *Treatise of the three Suns* seen the preceding winter; and also an astrological judgment upon a conjunction of Saturn and Mars. This year the council of state gave him in money 50l. and a pension of 100l. *per annum*, which he received for two years, and then resigned on some disgust. In June 1660, he was taken into custody by order of the parliament, by whom he was examined concerning the person who cut off the head of king Charles I. The same year he sued out his pardon under the great seal of England. The plague raging in London, he removed with his family to his estate at Herisham; and in October 1666, was examined before a committee of the house of commons concerning the fire of London, which happened in September that year. After his retirement to Herisham, he applied himself to the study of phylis, and, by means of his friend Mr Ashmole, obtained from archbishop Sheldon a licence for the practice of it. A little before his death he adopted for his son, by the name of *Merlin junior*, one Henry Coley, a taylor by trade; and at the same time gave him the impression of his almanac, after it had been printed for 36 years. He died in 1681, of a dead palsy. Mr Ashmole set a monument over his grave in the church of Walton upon Thames. His "Observations on the Life and Death of Charles late king of England," if we overlook the astrological nonsense, may be read with as much satisfaction as more celebrated histories, Lilly being not only very well informed, but strictly impartial. This work, with the *Lives of Lilly and Ashmole*, written by themselves, were published in one vol 8vo, in 1774, by Mr Burman.

LILYÆUM, (anc. geog.), a city of Sicily, situated on the most westerly promontory of the island of Sicily, and said to have been founded by the Carthaginians on their expulsion from Motya by Dionysius tyrant of Syracuse. It is remarkable for three sieges it sustained; one against Dionysius the tyrant, another against Pyrrhus king of Epirus, and the third against the Romans. The two first failed in their attempts, but the Romans with great difficulty made themselves masters of it. No remains of this once stately city are now to be seen except some aqueducts and temples; though it was standing in Strabo's time.

LILYE (William), the grammarian, was born in the year 1478, at Odiham in Hampshire; and in 1486, was admitted a semi-commoner of Magdalen college, in Oxford. Having taken the degree of bachelor of arts, he left the university, and travelled to Jerusalem. Returning from thence, he continued five years in the island of Rhodes, where he studied the Greek language, several learned men having retired thither after the taking of Constantinople. From Rhodes he travelled to Rome; where he improved himself in the Greek and Latin languages, under Sulpitius and P. Sabinus. He then returned to London, where for some time he taught a private grammar-school, being the first person who taught Greek in the metropolis. In 1510, when Dr Colet founded St Paul's school, Lilys was appointed

Lilly  
Lilye.



Lima. pointed the first master; at which time, it seems, he was married and had many children. In this employment he had laboured 12 years, when, being seized by the plague, which then raged in London, he died in February 1523, and was buried in the north yard of St Paul's. He had the character of an excellent grammarian, and a successful teacher of the learned languages. His principal work is *Brevissima institutio, seu ratio grammaticæ cognoscendæ*; Lond. 1513. Reprinted times without number, and commonly called *Lily's grammar*. The English rudiments were written by Dr Colet, dean of St Paul's; and the preface to the first edition, by cardinal Wolsey. The English syntax was written by Lilye; also the rules for the genders of nouns, beginning with *Propria que maribus*; and those for the preterperfect tenses and supines, beginning with *As in præsentis*. The Latin syntax was chiefly the work of Erasmus. See Ward's preface to his edition of Lily's Grammar, 1732.

LIMA, a city of South America, in Peru, of which it is capital, with an archbishop's see, and an university. It gives its name to the principal audience of Peru; and is surrounded with brick walls, fortified with several ramparts and bastions, eight yards high. The streets are handsome, and as straight as a line; but the houses are generally only one story high, on account of the earthquakes. However, they are pretty enough, and well adorned, having long galleries on the front. One part of the roofs are covered with coarse linen cloth, and the others only with reeds, which is not inconvenient, because it never rains here; however, the richest inhabitants cover theirs with fine mats, or beautiful cotton-cloths. There are trees planted all round their houses, to keep off the heat of the sun. What the houses want in height they have in length and depth; for some of them are 200 feet long, and proportionally broad, so that they have 10 or 12 large apartments on the ground-floor. The royal square is very handsome, and in the middle there is a fountain of bronze, adorned with the image of fame, which spouts out water. On the east and west sides are the public structures, which are well built. The river which crosses Lima forms canals or streams which run to most of the houses, and serve to water their gardens, as well as for other uses. All the churches and convents are extremely rich; and many images of the saints are of massy gold, adorned with jewels. This city is four miles in length, and two in breadth, and is divided into eight parishes; and yet it contains but 28,000 inhabitants, whereof 9000 are Spaniards. They make use of mules to draw their coaches with, and of these there are about 5000. It is the seat of the viceroy; and contains several courts, as that of the viceroy, of the archbishop, of the inquisition, of the crusado, and of the wills. Earthquakes are here very frequent; some of which have done this city a great deal of damage, particularly that in 1746, whereby it was almost destroyed: were it not for this, it would be a perfect paradise; there being plenty of corn, wine, oil, sugar, fruits, and flax. The inhabitants are so rich, that when the viceroy, who was duke of Palata, and sent from Spain to Peru in 1672, made his public entrance into this city, the inhabitants paved the streets he was to pass through with ingots of silver. The inhabitants of Lima are very debauched, but at the same time ex-

remely superstitious, and they have a strong belief in the power of charms. About a fourth part of the city are monks and nuns, who are not a jot more chaste than the rest; and if any one happens to rival a monk, he is in danger of his life, for they always carry a dagger under their frocks. The sons are such libertines, that it is hard to find any free from the French disease, of which they sometimes die for want of good physicians. The greatest sinners think they atone for all their faults by hearing a mass, and kissing the robe of St Francis or St Dominic, and then they return to their former practices. It is seated on a large, pleasant, fertile plain, on a small river, near the sea. W. Long. 68. 45. S. Lat. 12. 15.

LIMAX, the Slug, or *Naked Snail*; a genus of insects, belonging to the order of vermes mollusca; the characters of which are these: The body is oblong, fitted for crawling, with a kind of muscular coat on the upper part; and the belly is plain: they have a roundish hole in the side, near the neck, which serves for the purpose of genitals, and for voiding their excrements. They have likewise four tentacula, or horns, situated above the mouth, which they extend or retract at pleasure. There are eight species, distinguished entirely by their colour; as the black slug, the white slug, the reddish slug, the ash-coloured slug, &c. The last of these, the agrestis or field-slug, is very common in gardens, and destructive to plants. They are sometimes swallowed by consumptive persons, to whom they are thought to be of service. Snails are said to be hermaphrodites, and mutually to impregnate each other. See REPRODUCTION.

LIMB, in general, denotes the border or edge of a thing; thus we say, the limb of a quadrant, of the fun, of a leaf, &c.

LIMB, in anatomy, an appellation given to the extremities of the body, as to the arms and legs.

LIMB, *Limbus*, in the church of Rome, is used in two different senses. 1. The limb of the patriarchs is said to be the place where the patriarchs waited the redemption of mankind: in this place they suppose our Saviour's soul continued from the time of his death to his resurrection. 2. The limb of infants dying without baptism, is a place supposed to be distinct both from heaven and hell; since, say they, children dying innocent of any actual sin, do not deserve hell; and, by reason of their original sin, cannot be admitted into heaven.

LIMBORCH (Philip), a learned writer among the remonstrants, born at Amsterdam in 1633. After having made great proficiency in his studies, he was, in 1655, admitted to preach in public, which he did first at Harlem. His sermons had in them no affected eloquence; but were solid, methodical, and edifying. He was chosen minister of Goudja; from whence he was called to Amsterdam, where he had the professorship of divinity, in which he acquitted himself with great reputation till his death, which happened in the 1712. He had an admirable genius, and a tenacious memory. He had many friends of distinction in foreign parts as well as in his own country. Some of his letters to Mr Locke are printed with those of that celebrated author. He had all the qualifications suitable to the character of a sincere divine, lived an example of every virtue, and preserved the vigour of his body and mind to a con-

Limax  
||  
Limborch.

**Limburch** considerable age. He wrote many works, which are esteemed; the principal of which are, 1. *Amica collatio de veritate religionis Christianae cum erudito Judeo*, in 12mo. 2. A complete body of Divinity, according to the opinions and doctrines of the remonstrants. 3. A history of the Inquisition; which has been translated into English by Dr Samuel Chandler. Limborch also published the works of the famous Episcopus, who was his great-uncle by the mother's side.

**LIMBURGH DUCHY**, a province of the Austrian Netherlands, bounded by the duchy of Juliers on the north and east, by Luxemburg on the south, and by the bishopric of Liege on the west. It is about 30 miles in length, and 25 in breadth; and consists of good arable and pasture land, with plenty of wood, and some iron mines.

**LIMBURGH**, the capital city of the duchy of Limburgh, in the Austrian Netherlands, is seated on a steep rock near the river Vesle. This town is small, but pleasantly seated on a hill, with shady woods; and consists chiefly of one broad street, not very well built. It is strong by situation, and almost inaccessible; however, it was taken by the French in 1675, and by the confederates under the duke of Marlborough in 1603, for the house of Austria, to whom it remains by the treaties of Rastadt and Baden, after having been dismantled. It is famous for its cheese, which is exceedingly good. E. Long. 6. 8. N. Lat. 50. 40.

**LIME**. See **QUICKLIME**.

**LIMERICK**, a county of Ireland in the province of Munster, is bounded on the east by Tipperary, on the west by Kerry, on the north by the river Shannon, and on the south by Cork. It is 48 miles in length, and 27 in breadth; being a fertile country and well inhabited, but has few good towns: the west parts are mountainous, and the rest plain; and it is divided into nine baronies.

**LIMERICK**, or *Lough-Meath*, a market-town, a borough, and a bishop's see, now the metropolis of the province of Munster. It is an elegant, rich, populous city, and of singular strength, seated partly on an island of the river Shannon, and is counted two towns; in the upper stands the castle and cathedral. It has two handsome bridges of stone, as also bulwarks and little drawbridges, the one leading to the west and the other to the east; to this the lower town is joined, and is strengthened with a wall, a castle, and a fore-gate, at the entrance into it. It was besieged by king William III. in the year 1690; and though there was no army to assist it, the king was obliged to raise the siege. In the year 1691, it was again besieged by the English and Dutch on the 21st of September; and it was obliged to surrender on the 13th of October following, not without the loss of abundance of men: however, the garrison had very honourable and advantageous conditions, being permitted to retire where they thought fit, and the Roman-catholics by these articles were to be tolerated in the free exercise of their religion. W. Long. 8. 30. N. Lat. 52. 35.

**LIMINGTON**, a town of Hampshire in England. See **LIMINGTON**.

**LIMIT**, in a restrained sense, is used by mathematicians for a determined quantity to which a variable one continually approaches; in which sense, the circle

may be said to be the limit of its circumscribed and inscribed polygons. In algebra, the term *limit* is applied to two quantities, one of which is greater and the other less than another quantity; and in this sense it is used in speaking of the limits of equations, whereby their solution is much facilitated.

**LIMNING**, the art of painting in water-colours, in contradistinction to painting which is done in oil-colours.

Limning is much the more ancient kind of painting. Till a Flemish painter, one John van Eyck, better known by the name of *John of Bruges*, found out the art of painting in oil, the painters all painted in water, and in fresco, both on their walls, on wooden boards, and elsewhere. When they made use of boards, they usually glued a fine linen cloth over them, to prevent their opening; then laid on a ground of white; lastly, they mixed up their colours with water and size, or with water and yolks of eggs, well beaten with the branches of a fig-tree, the juice whereof thus mixed with the eggs; and with this mixture they painted their pieces.

In limning, all colours are proper enough, except the white made of lime, which is only used in fresco. The azure and ultramarine must always be mixed with size or gum; but there are always applied two layers of hot size before the size-colours are laid on: the colours are all ground in water each by itself; and, as they are required in working, are diluted with size-water. When the piece is finished, they go over it with the white of an egg well beaten; and then with varnish, if required.

To limn, or draw a face in colours: Having all the materials in readiness, lay the prepared colour on the card even and thin, free from hairs and spots over the place where the picture is to be. The ground being laid, and the party placed in a due position, begin the work, which is to be done at three fittings. At the first you are only to dead-colour the face, which will require about two hours. At the second fitting, go over the work more curiously, adding its particular graces or deformities. At the third fitting, finish the whole; carefully remarking whatever may conduce to render the piece perfect, as the cast of the eyes, moles, scars, gestures, and the like.

**LIMOGES**, an ancient and considerable town of France, in the province of Guienne, and capital of Limosin, with a bishop's see. It is a trading place, and its horses are in great esteem. It is seated on the river Vienne, in E. Long. 1. 22. N. Lat. 42. 48.

**LIMOSIN**, a province of France, bounded on the north by La Marche, on the east by Auvergne, on the south by Quercy, and on the west by Perigord and Angoumois. It is divided into the Upper and Lower; the former of which is very cold, but the latter more temperate. It is covered with forests of chestnut-trees; and contains mines of lead, copper, tin, and iron; but the principal trade consists in cattle and horses.

**LIMPET**. See **PATELLA**.

**LIMPURG**, a barony of Germany, in the circle of Franconia, included almost entirely within Suabia, and seated to the south of Hall in Suabia. It is about 15 miles long, and eight broad. Gaifford and Shonburg, near which is the castle of Limpurg, are the principal places.

**LIM-**

**Limburch**  
**Limit.**

**Limburch**  
**Limpurg.**

LIMBURG, a town of Germany, in the electorate of Triers or Treves, and in Wetteravia, formerly free and imperial, but now subject to the electorate of Treves. It is seated on the river Lhon. E. Long. 8. 13. N. Lat. 50. 18.

LINARIA, in ornithology. See FRINGILLA.

LINACRE (Thomas), physician, was born at Canterbury about the year 1460, and there educated under the learned William Selling; thence he removed to Oxford, and in 1484 was chosen fellow of All-Souls college. Tilly, alias Selling, his former instructor, being at this time appointed ambassador from king Henry VII. to the court of Rome, Mr Linacre accompanied him to Italy, where he attained the highest degree of perfection in the Greek and Latin languages. At Rome, he applied himself particularly to the study of Aristotle and Galen, in the original. On his return to Oxford, he was incorporated doctor of physic, and chosen public professor in that faculty. But he had not been long in England, before he was commanded to court by king Henry VII. to attend the young prince Arthur as his tutor and physician. He was afterwards appointed physician to the king, and, after his death, to his successor Henry VIII.

Dr Linacre founded two medical lectures at Oxford, and one at Cambridge; but that which most effectually immortalized his name among the faculty, is his being the first founder of the college of physicians in London. He beheld with vexation the wretched state of physic in those times; and, by an application to cardinal Wolsey, obtained a patent in 1518, by which the physicians of London were incorporated. The intention of this corporation was to prevent illiterate and ignorant medicalists from practising the art of healing. Doctor Linacre was the first president, and held the office as long as he lived. Their meetings were in his own house in Knight-rider street, which house he bequeathed to the college. But our doctor, when he was about the age of 50, took it into his head to study divinity; entered into orders; and was collated, in 1509, to the rectory of Merham. In the same year he was installed prebendary of Wells, in 1518 prebendary of York, and in the following year was admitted precentor of that cathedral. This, we are told, he resigned for other preferments. He died of the stone in the bladder in October 1524, aged 64; and was buried in St Paul's. Thirty-three years after his death, doctor John Caius caused a monument to be erected to his memory, with a Latin inscription, which contains the outlines of his life and character. He was a man of great natural sagacity, a skilful physician, a profound grammarian, and one of the best Greek and Latin scholars of his time. Erasmus in his epistles speaks highly of the doctor's translations from Galen, preferring them even to the original Greek. His works are, 1. *De emendata structura Latini sermonis, libri sex*; London, printed by Pynson, 1524, 8vo. and by Stephens, 1527, 1532. 2. *The rudiments of grammar*, for the use of the princess Mary, printed by Pynson. Buchanan translated it into Latin; Paris, 1536. He likewise translated into very elegant Latin, several of Galen's works, which were printed chiefly abroad at different times. Also *Procli Diadochi sphaera*, translated from the Greek; Venet. 1499, 1500.

LINCOLN, a city of England, and capital of a county of the same name, stands on the side of a hill, at the bottom of which runs the river Witham. The old *Lindum* of the Britons, which stood on the top of the hill, as appears from the vestiges of a rampart, and deep ditches still remaining, was taken and demolished by the Saxons; who built a town upon the south side of the hill down to the river-side, which was several times taken by the Danes, and as often retaken by the Saxons. In Edward the Confessor's time, it appears, from Doomday-book, to have been a very considerable place; and in the time of the Normans, Malmshury says, it was one of the most populous cities in England. William I. built a castle upon the summit of the hill above the town. The diocese, tho' the bishopric of Ely was taken out of it by Henry II. and those of Peterborough and Oxford by Henry VIII. is still vastly large, containing the counties of Leicesters, Huntingdon, Bedford, and part of Bucks, making 1255 parishes. Though the other churches are mean, the cathedral, or minster, is a most magnificent piece of Gothic architecture. Here is a prodigious large bell, called *Tom of Lincoln*, which is near five ton in weight, and 23 feet in compass. The hill on which the church stands is so high, and the church itself so lofty, that it may be seen 50 miles to the north, and 30 to the south. Besides other tombs, it contains one of brass, in which are the entrails of queen Eleanor, wife to Edward I. It is said there were anciently 52 churches, which are now reduced to 13. Such is the magnificence and elevation of the cathedral, that the monks thought the sight of it must be very mortifying to the devil; whence it came to be said of one who was displeased, *that he looked like the devil over Lincoln*. The declivity on which the city is built being steep, the communication betwixt the upper and lower town is very troublesome, and coaches and horses are obliged to make a compass. The little river Witham runs through the town; and on the west side forms a large pool, called, from the number of swans upon it, *swan-pool*, which has a communication with the Trent by a canal, called the *seja-dyke*. In the upper town, many gentlemen, besides the prebendaries and others of the clergy, have handsome houses of modern architecture. There are four charity-schools, in each of which 30 poor children are taught by clergymen widows. It is governed by a mayor, 12 aldermen who are justices of the peace, two sheriffs, a recorder, four chamberlains, a sword-bearer, four coroners, and above 40 common-council; and has a vicinial jurisdiction 20 miles round, a privilege which no other city in England can boast of. The country round is very fertile and pleasant, and the tract called *Lincoln heath* extends above 50 miles. On the down, towards Boston, are sometimes seen those rare birds called *bustards*. Here are frequent horse-races, markets on Tuesday and Friday, fairs first Tuesday in April, June 24, first Friday in September, and November 17. It has given the title of earl to the family of Clinton, ever since the reign of queen Elizabeth. W. Long. 27. 1. N. Lat. 53. 16.

LINCOLNSHIRE, a maritime county of England, having the German ocean on the east, Northamptonshire on the south, from which it is separated by the river Welland, as it is on the west from Yorkshire by the



Lincoln,  
Lindsey.

the Humber: it has also on the west, part of Nottinghamshire, Leicestershire, and Rutlandshire. Its greatest length is above 60 miles, and its greatest breadth about 40, making upwards of 180 miles in circumference, containing 2162 square miles; or, according to others, 1,740,000 acres, 30 hundreds or wapentakes, 688 parishes, one city, five parliamentary boroughs, 34 other market-towns, and about 254,540 inhabitants. The names of the three grand divisions are Holland, Kesteven, and Lindsey; the last of which is by much the largest. The soil of Holland being marshy, the air is moist and foggy, and therefore unwholesome. Kesteven has a drier and more fruitful soil, and consequently a better air. Of the third division, Lindsey, the air is reckoned good and wholesome. There are many large rivers in the county, as the Nen, Welland, Gnash, Witham, Bane, Trent, Don, and Ankam, all abounding with fish. In the Fens are very rich pastures; so that their cattle are the largest in England, unless, perhaps, we should except those of Somersetshire: and at certain seasons the numbers of fowl are amazing, especially of ducks; so that Camden says, they could, in his time, about Crowl "catch 1000 at once in August with a single net; and they called the pools where they caught them, their corn-fields, no corn then growing within five miles of the place: that of these fowls there were some sorts not only very rare, but extremely delicate, as the puittes, knotts, and goodwitts; so that the nicest palates and richest purses greatly coveted them." The knotts are said to be so called, from their having been first brought from Denmark for the use of king Canute. The dotted is so called because it is a very simple bird, and mimicks all the motions of the fowler, till it is easily caught by candle-light. They have all the common fruits, and some of them in greater perfection than in other parts of England. Their hares and their hounds are said to be exceeding swift. The fens seem to have been over-run with wood anciently, for trunks of trees are still found in them. The churches in Lincolnshire are said to be very fine, but the houses indifferent. There is a homely proverb, which says, that its hogs thr—t soap, and its cows fire; because the poor people wash their clothes with hogs dung, and from the scarcity of other fuel, burn dried cow-dung. It is entirely in the diocese of Lincoln; and sends 12 members to parliament, viz. two knights for the shire, two citizens for Lincoln, two burgesses for Boston, two for Great Grimsby, two for Stamford, and two for Grantham.

LINDSEY (Sir David), a celebrated Scots poet, was descended of an ancient family, and born in the reign of king James IV. at his father's seat called the *Mount*, near Coupar in Fifeshire. He was educated at the university of St Andrews; and, after making the tour of Europe, returned to Scotland in the year 1514. Soon after his arrival, he was appointed gentleman of the bed-chamber to the king, and tutor to the young prince, afterwards James V. From the verses prefixed to his dream, we learn that he enjoyed several other honourable employments at court; but, in 1533, he was deprived of all his places, except that of *Lion king at arms*, which he held to the time of his death. His disgrace was most probably owing to his invectives against the clergy, which are frequent in

all his writings. After the decease of king James V. Sir David became a favourite of the earl of Arran, regent of Scotland; but the abbot of Paisley did not suffer him to continue long in favour with the earl. He then retired to his paternal estate, and spent the remainder of his days in rural tranquillity. He died in the year 1553. His poetical talents, considering the age in which he wrote, were not contemptible; but he treats the Romish clergy with great severity, and writes with some humour; but, whatever merit might be formerly attributed to him, he takes such licentious liberties with words, stretching, or carving them for measure or rhyme, that the Scots have a proverb, when they hear an unusual expression, that, *There is nae sic a word in a' Davie Lindsay*. Mackenzie tells us, that his comedies were so facetious, that they afforded abundance of mirth. Some fragments of these comedies are still preserved in manuscript. He is said to have also written several tragedies, and to have first introduced dramatic poetry into Scotland. One of his comedies was played in 1515. Mackenzie says, he understood nothing of the rules of the theatre. He was cotemporary with John Heywood, the first English dramatic poet. His poems are printed in one small volume; and fragments of his plays, in manuscript, are in Mr William Carmichael's collection.

LINDSEY, the third and largest division of the county of Lincolnshire in England. On the east and north it is washed by the sea, into which it runs out with a large front; on the west it has Yorkshire, and Nottinghamshire, from which it is yorke by the rivers Trent and Don; on the south it has Kesteven, from which it is separated by the river Witham, and the Foss-dyke, which is seven miles long, and was cut by Henry I. between the Witham and the Trent, for the convenience of carriage in those parts. It had its name from Lincoln, the capital of the county, which stands in it, and by the Romans called *Lindum*, by the Britons *Lyndeait*, by the Saxons *Lindo-collene*, probably from its situation on a hill, and the lakes or woods that were anciently thereabouts; but the Normans called it *Nicol*. It gives title of earl and marquis to the duke of Ancaster.

LINDUS, (auc. geog.), a town of Rhodes, situated on an eminence, on the south-east side of the island; with a temple of Minerva surnamed *Lindia*, built by Danaus, Herodotus, and Strabo; in which the seventh Olympian ode of Pindar was written in letters of gold. The town was built by Tlepolemus the son of Hercules, according to Diodorus Siculus; by one of the Heliades, grandsons of the Sun, named *Lindus*, according to Strabo. It was the native place of Cleobulus, one of the wise men. It is still extant, and called *Lindo*.

LINE, in geometry, a quantity extended in length only, without any breadth or thickness. It is formed by the flux or motion of a point. See *FLUXIONS*, and *GEOMETRY*.

LINE, in the art of war, is understood of the disposition of an army ranged in order of battle with the front extended as far as may be, that it may not be flanked.

LINE of Battle, is also understood of a disposition of the fleet in the day of engagement; on which occasion the vessels are usually drawn up as much as possible

Lindley  
Line.

in a straight line, as well to gain and keep the advantage of the wind as to run the same board. See *Naval TACTICS*.

*Horizontal LINE*, in geography and astronomy, a line drawn parallel to the horizon of any part of the earth.

*Equinoctial LINE*, in geography, is a great circle on the earth's surface, exactly at the distance of 90° from each of the poles, and of consequence bisecting the earth in that part. From this imaginary line, the degrees of longitude and latitude are counted.—In astronomy, the equinoctial line is that circle which the sun seems to describe round the earth on the days of the equinox in March and September. See *ASTRONOMY*; and *GEOGRAPHY*, n° 28.

*Meridian LINE*, is an imaginary circle drawn thro' the two poles of the earth and any part of its surface. See *GEOGRAPHY*, n° 29.

*Ship of the LINE*, a vessel large enough to be drawn up in the line, and to have a place in a sea-fight.

*LINE*, in genealogy, a series or succession of relations in various degrees, all descending from the same common father. See *DESCENT*.

*LINE*, also denotes a FRENCH measure containing the 12th part of an inch or the 144th part of a foot. Geometricians conceive the line subdivided into six points. The French line answers to the English barley-corn.

*Fishing LINE*. See *FISHING LINE*.

*LINEs*, in heraldry, the figures used in armories to divide the shield into different parts, and to compose different figures. These lines, according to their different forms and names, give denomination to the pieces or figures which they form, except the straight or plain lines.

*LINEA ALBA*, in anatomy, the concourse of the tendons of the oblique and transverse muscles of the abdomen; dividing the abdomen in two, in the middle. It is called *linea*, line, as being straight; and *alba*, from its colour, which is white.—The *linea alba* receives a twig of a nerve from the intercostals in each of its digitations or indentings, which are visible to the eye, in lean persons especially.

*LINEAMENT*, among painters, is used for the outlines of a face.

*LINEAR NUMBERS*, in mathematics, such as have relation to length only; such is a number which represents one side of a plain figure. If the plain figure be a square, the linear figure is called a *root*.

*LINEAR Problem*; that which may be solved geometrically by the intersection of two right lines. This is called a *simple problem*, and is capable but of one solution.

*LINEN*, in commerce, a well-known kind of cloth chiefly made of flax. The linen manufacture was probably introduced into Britain with the first settlements of the Romans. The flax was certainly first planted by that nation in the British soil. The plant itself indeed appears to have been originally a native of the east. The woollen drapery would naturally be prior in its origin to the linen; and the fibrous plants from which the threads of the latter are produced, seems to have been first noticed and worked by the inhabitants of Egypt. In Egypt, indeed, the linen manufacture

appears to have been very early: for even in Joseph's time it had risen to a considerable height. From the Egyptians the knowledge of it proceeded probably to the Greeks, and from them to the Romans. Even at this day the flax is imported among us from the Eastern nations; the western kind being merely a degenerate species of it.

In order to succeed in the linen manufacture, one set of people should be confined to the ploughing and preparing the soil, sowing and covering the seed, to the weeding, pulling, rippling, and taking care of the new seed, and watering and dressing the flax till it is lodged at home: others should be concerned in the drying, breaking, scutching, and heckling the flax, to fit it for the spinners; and others in spinning and reeling it, to fit it for the weaver: others should be concerned in taking due care of the weaving, bleaching, beetling, and finishing the cloth for the market. It is reasonable to believe, that if these several branches of the manufacture were carried on by distinct dealers in Scotland and Ireland, where our home-made linens are manufactured, the several parts would be better executed, and the whole would be afforded cheaper, and with greater profit.

*Staining of LINEN*. Linen receives a black colour with much more difficulty than woollen or cotton. The black struck on linen with common vitriol and galls, or logwood, is very perishable, and soon washes out. Instead of the vitriol, a solution of iron in four strong-beer is to be made use of. This is well known to all the calico-printers; and by the use of this, which they call their *iron liquor*, and madder-root, are the blacks and purples made which we see on the common printed linens. The method of making this iron-liquor is as follows: A quantity of iron is put into the four strong-beer; and, to promote the dissolution of the metal, the whole is occasionally well stirred, the liquor occasionally drawn off, and the rust beat from the iron, after which the liquor is poured on again. A length of time is required to make the impregnation perfect; the solution being reckoned unfit for use till it has stood at least a twelvemonth. This solution stains the linen of a yellow, and different shades of buff colour; and is the only known substance by which these colours can be fixed on linen. The cloth stained deep with the iron liquor, and afterwards boiled with madder, without any other addition, becomes of the dark colour which we see on printed linens and cottons; which, if not a perfect black, has a very near resemblance to it. Others are stained paler with the same liquor diluted with water, and come out purple.

Linen may also be stained of a durable purple by means of solution of gold in aqua regia. The solution for this purpose should be as fully saturated as possible; it should be diluted with three times its quantity of water; and if the colour is required deep, the piece, when dry, must be repeatedly moistened with it. The colour does not take place till a considerable time, sometimes several days, after the liquor has been applied: to hasten its appearance, the subject should be exposed to the sun and free air, and occasionally removed to a moist place, or moistened with water.—When solution of gold in aqua regia is soaked up in linen cloths, the metal may be recovered by drying and burning them.

Linen.

The anacardium nut, which comes from the East-Indies, is remarkable for its property of staining linen of a deep black colour, which cannot be washed out either with soap or alkaline ley. The stain is at first of a reddish-brown, but afterwards turns to a deep black on exposure to the air. The cashew-nut, called the *anacardium of the West-Indies*, differs from the oriental anacardium, in its colouring quality. The juice of this nut is much paler than the other, and stains linen or cotton only of a brownish colour; which indeed is very durable, but does not at all change towards blackness. — There are, however, trees, natives of our own colonies, which appear to contain juices of the same nature with those of India. Of this kind are several, and perhaps the greater number, of the species of the toxicodendron or poison-tree †. Mr Catesby, in his history of Carolina, describes one called there the *poison-ash*, from whose trunk flows a liquid as black as ink, and supposed to be poisonous; which reputed poisonous quality has hitherto prevented the inhabitants from collecting or attempting to make any use of it. In the Philosophical Transactions for the year 1755, the abbé Mazzeas gives an account of three sorts of the toxicodendron raised in a botanic garden in France, containing in their leaves a milky juice, which in drying became quite black, and communicated the same colour to the linen on which it was dropped. The linen thus stained was boiled with soap, and came out without the least diminution of colour; nor did a strong ley of wood-ashes make any change in it. Several of these trees have been planted in the open ground in England, and some still remain in the bishop of London's garden at Fulham.

That species called by Mr Miller the *true lac tree*, was found by Dr Lewis to have properties of a similar kind. It contains in its bark, and the pedicles and ribs of the leaves, a juice somewhat milky, which soon changed in the air to a reddish-brown, and in two or three hours to a deep blackish or brownish-black colour: wherever the bark was cut or wounded, the incision became blackish; and on several parts of the leaves the juice had spontaneously exuded, and stained them of the same colour. This juice, dropped on linen, gave at first little or no colour, looking only like a spot of oil; but, by degrees, the part moistened with it darkened in the same manner as the juice itself. On washing and boiling the linen with soap, the stain not only was not discharged, but seemed to have its blackness rather improved; as if a brown matter, with which the black was manifestly debased, had been in part washed out, and left the black more pure.

As the milky juices of some of our common plants turn dark-coloured or blackish in drying, the doctor was induced to try the effects of several of them on linen. The milks of wild-poppies, garden-poppies, dandelion, hawk-weed, and fow-thistle, gave brown or brownish-red stains, which were discharged by washing with soap; the milks of the fig-tree, of lettuces, and of different kinds of spurge, gave no colour at all. The colourless juice which issues from horn-halks when cut, stains linen of a pale-reddish or brownish-red, extremely durable; the colour was deepened by repeated applications of the juice, but it never made any approach to blackness. The juice of flos gave likewise

a pale-brownish stain, which, by repeated washings with soap, and being wetted with strong solution of alkaline salt, was darkened to a deeper brown: on baking the flos, their juice turns red; and the red stain which it then imparts to linen is, on washing with soap, changed to a pale-blueish, which also proves durable. These colours could not be deepened by repeated applications of the juice. The flos were tried in different states of maturity, from the beginning of September to the middle of December, and the event was always nearly the same.

In the fifth volume of Linnæus's *Amenitatis Academicæ*, mention is made of a black colour obtained from two plants which grow spontaneously in Britain; the one is the *allæa spicata*, herb-christopher, or bane-berries; the other the *enica baccifera nigra*, black-berried heath, crow-berries, or crane-berries. The juice of the bane-berries boiled with alum, is said to yield a black ink; and the heath-berries, boiled also with alum, to dye linen of a purplish black.

LINEN *flowered with Gold-leaf*. Dr Lewis informs us of a new manufacture established in London for embellishing linen with flowers and ornaments of gold-leaf. The linen, he says, looks whiter than most of the printed linens; the gold is extremely beautiful, and bears washing well. The doctor informs us, that he had seen a piece which he was credibly informed had been washed three or four times, with only the same precautions which are used for the finer printed linens; and on which the gold continued entire, and of great beauty. — Concerning the process used in this manufacture, he gives us no particulars.

*Fossil* LINEN, is a kind of amianthus, which consists of flexible, parallel, soft fibres, and which has been celebrated for the uses to which it has been applied, of being woven, and forming an *incombustible cloth*. Paper also, and wicks for lamps, have been made of it. See AMIANTHUS and ASBESTOS.

LING, in zoology. See GADUS.

LINGEN, a strong town of Germany, in the circle of Westphalia, and capital of a county of the same name. It belongs to the king of Prussia; and is situated on the river Embs, in E. Long. 7. 30. N. Lat. 52. 32.

LINGELBACH (John), an excellent painter, born at Frankfort on the Maine in 1625. He first learned the art in Holland, but perfected himself at Rome; where he studied till he was 25 years of age, when he settled at Amsterdam. His usual subjects are fairs, mountebanks, sea-pieces, and landscapes, which he composed and executed exceeding well: his landscapes are enriched with antiquities, animals, and elegant figures; his sea-sights are full of expression, exciting pity and terror, and all his objects are well designed. He had an uncommon readiness in painting figures and animals, on which account he was employed by several eminent artists to adorn their landscapes with such objects; and whatever he inserted in the works of other masters, were always well adapted, and produced an agreeable effect. He died in 1687.

LINIMENT, in pharmacy, a composition of a consistence somewhat thicker than an unguent, and thicker than an oil used for anointing different parts of the body in various intentions. — The materials proper

† See RUBUS.

Linen.

Liniment.



linlithgowshire,  
Linnaeus.

proper for composing *liniments* are, fats, oils, balsams, and whatever enters the composition of unguents and plaisters.

**LINLITHGOWSHIRE**, or **WEST LOTHIAN**, a small county of Scotland, not exceeding 14 miles in length and 13 in breadth, is bounded on the north by part of Stirlingshire and the river Forth, by part of Clydesdale on the west, and on the south and west by Mid-Lothian, from which it is divided by the rivers Breich and Almond. The country is pleasant and fertile, abounding with corn and pasturage. Here is found plenty of coal, limestone, and lead ore; nay, in the reign of James VI. it produced a rich mine of silver. The chief town, Linlithgow, from which it borrows the name, is a royal borough and seat of a presbytery, standing on the side of a small lake, about 18 miles from Edinburgh: it consists of one open street, from whence lanes are detached on both sides; the houses are built of stone, tolerably neat and commodious; and the place is adorned with some stately public edifices. On the side of the lake stands a royal palace, magnificently built of hewn stone, begun by king James V. and perfected by his grandson. Within the inner court, which is larger than that of Hamilton, there is an artificial fountain, adorned with statues and water-works; and at each corner of the square a tower, with a range of fine apartments. Hard by the palace is the church of St Michael, a noble structure, with a very high steeple. The inhabitants carry on a great manufacture of linen, and bleach it with the water of this lake, which is noted for its whitening quality: they likewise enjoy a tolerable share of trade, by means of a good harbour on the Forth, where they have built a custom-house, and magazines or ware-houses for the use of the merchants. Hard by this harbour stands the castle of Blackness, belonging to the crown, formerly used as a state prison, but now quite ruinous. The chiefs of the Livingstone family were earls of Linlithgow and Caender, hereditary keepers of the palace in this town, and hereditary constables of Blackness castle. The last of these noblemen forfeited his estate and honours, by engaging in the rebellion of the year 1715.

**LINNAEUS** (Sir Charles), a celebrated botanist and natural historian, was born on May 24. 1707, O. S. in a village called *Roosbult*, in Smaland, where his father, Nicolas Linnaeus, was then vicar, but afterwards preferred to the curacy of Stenbrolund. On the farm where Linnaeus was born, there yet stands a large lime-tree, from which his ancestors took the surnames of *Tiliander*, *Lindelius*, and *Linnaeus*. Of such surnames, derived from some natural object, there are many other instances in Sweden, which seem to evince, at least, that the taste for natural knowledge is of a very ancient standing in that country. Charles's father, who was a great florist, regaled his wife, during her pregnancy with this her first son, with the choicest flowers; with which he also often bestrewed the child's cradle, and presented him with flowers instead of the usual toys. As soon as little Linné was able to run after his father, he made gardening his chief amusement. He soon knew garden-plants, and then began to gather such as grew wild in his neighbourhood; for which he found yet better opportunity at Wexiö, whither he was, in 1717, sent to school.

In 1727, Linnaeus went to the academy at Lund, where the celebrated Kilian Stobæus favoured his genius for natural knowledge with his patronage. Even at his native farm he had already hunted after insects; neither did he lose that taste, though he was at Lund once stung by the *furia infernalis*, and had very narrowly escaped with life. From Lund he, in 1728, proceeded to the university at Upsal, always pursuing his favourite studies; but found himself, within less than a year, involved in debts for board and cloathing, without prospect of being extricated by any remittances from his indigent parents. Olof Celsius, the excellent author of the *Hiero-botanicum*, happening once to find him in the botanical garden, busied with describing plants, and being surprized to hear him name them all, took a liking to him, and received him to his house, his table, and his library. By this and some other unexpected and fortunate incidents, our Linnaeus was enabled to pursue his studies, notwithstanding the original lowness of his finances. So early as the 25th year of his age, he planned a considerable part of his system of botany. He was afterwards patronized by Rudbeck junior; who being then old, entrusted Linnaeus with reading the botanical lectures in his place, which he did with great zeal and success. In 1732, Linnaeus at the expense of the Society of Sciences at Upsal, made a scientific tour to Lapland, where he encountered hunger and cold, with a variety of dangers and hardships. The plants which he found in this tour, he, in the same year, exhibited in the memoirs of the society, classed according to his own system. During this tour, he had opportunities for cultivating the art of assaying minerals; on which art, and on mineralogy, he, after his return, read lectures at Upsal. For the same scientific purposes he also made journeys to the principal Swedish mines, during which he was greatly assisted by the liberality of Mr de Reuterholm; and, after having thus enlarged his acquaintance with the state of his own native country, he, in 1735, with a very slender support, began his travels into foreign countries.

He visited Hamburg, Amsterdam, the university of Harderwyck, where he was created a doctor in physic; and then hastened to Boerhaave at Leyden, who valued and recommended him to Mr Clifford, whose natural collections at Hitecamp Linnaeus was to describe. At Gronovius's persuasion, he, in 1736, published the original edition of his *System of Nature* in Holland; and, after this, many other of his works in the same country. In the mean time Linnaeus came over to England. His *System of Botany* was first adopted by Gronovius, in his *Virginian Flora*; and his names of plants by Van Royen, in his *Prodromus*; yet, though he lived very happy in Holland, and had the most advantageous offers made him there, he left that country and went to France, where he entered into the most intimate friendship with M. Bernard Jussieu. In 1738 he returned to Stockholm, where he began with practising physic, and was appointed professor of mineralogy, and physician to the admiralty. In 1739, he married the provincial physician Moræus's daughter, to whom he had been betrothed before his departure from Sweden. His spirit and zeal were now encouraged by a variety of rewards. The Royal Academy of Sciences, established in the same year at

Linnaeus. Stockholm, chose him their first speaker. At the public expence he made tours into several provinces of the kingdom, in order to explore their respective productions. In 1741, after professor Roberg's death, he succeeded to the chair of physic at Upsal; and as he had the celebrated M. de Rosenstein for his colleague in that profession, the faculty of physic became uncommonly flourishing in that university. The botanical garden of Upsal, which had been long ago founded by Rudbeck the elder, but destroyed by a fire in 1702, and afterwards neglected, was now soon restored by Linnaeus, and in three years brought to a degree of perfection equal at least to that of any other botanical garden whatever.

In the new green-house, a particular room was designed for a collection of natural curiosities, which was partly furnished by the court and wealthy individuals. Nor were the other branches of physic left unimproved by Linnaeus. His delivery in his lectures was exceedingly sprightly, and animated by a native eloquence peculiar to him; as he held them not merely for the sake of money, but inspired with a lively affection for their subjects. While his health and spirits remained, his school was always more crowded than that of any other professor; and on his botanical excursions, he was surrounded by still greater numbers of pupils. There is hardly a professor who can produce so many disciples, who, chiefly at his persuasion, have, for the enlargement of his favourite study, undertaken voyages and travels to the remotest parts of the globe. The celebrated names of Kalm, Hasselquist, Ternstroem, Torén, Oelbeck, Rolander, Loeffling, Berlin, Forskal, Solander, Thunberg, Sparrman, Rothman, with many others, such as Clas Alstroemer, Kehler, &c. who, in the pursuit of natural science, travelled through many countries of Europe, will ever do credit to Linnaeus's memory. He kept up a most extensive correspondence; every one strove to give him an early account of any new discovery made, and increase his collections, to which even many sovereign princes contributed. He was highly distinguished and favoured by the late king, the queen dowager, and the present king of Sweden, who often honoured him with their visits. No system or method of botany has ever yet been more generally adopted than his. Some noblemen of the first distinction caused a medal to be struck to his honour; and the late excellent count Tessin, who had ever been his chief patron, honoured him with another. In 1747, he had the title of *physician to the king* conferred on him: in 1753, he received the honour of knighthood of the polar star; and, in 1757, he was ennobled. In 1776, the present king of Sweden accepted his resignation of his place, and conferred on him a double pension, with a noble donation of two farms for himself and his children.—He did not live long after this period; dying in January 1778, aged 70 years and 8 months.

As to the private and personal character of this illustrious philosopher: His stature was diminutive and puny; his head large, and his hinder part very high; his look was ardent, piercing, and apt to daunt the beholder; his ear not sensible to music; his temper quick, but easily appeased; his memory good, though, in the latter period of his life, sometimes liable to

fail him; his knowledge of languages confined, yet no interesting discovery remained unknown to him. In summer, he used to sleep from ten to three o'clock; in winter, from nine to six; and instantly to cease his labours when he found himself not well disposed for them.—Both in his younger years, and in the decline of life, he was afflicted with various corporeal infirmities; and the disorder of which he died, an ulceration of the urinary bladder, was long and painful. The severity, however, even of his last illness did not interrupt the ardour of his scientific pursuits. And, to the fruits of his labours which the world already enjoy, future additions still remain to be made. Before his death he had finished the greatest part of the *Mantissa Tertia*. And, we are told, that his son, who has already given several specimens of his taste for botany, and other branches of natural history, labours hard in completing this work. After this, we are informed, that he intends to publish a large collection of plants which his father had lately received from the Cape of Good Hope, from Mutis in Mexico, from Koenig in India, and several other places. These, added to the inestimable works which he has already published, will be the most lasting monuments of a man, who, in the eyes of posterity, must be considered not only as a glory to his country, but as an ornament to the age in which he lived.

His contemporaries, however, and surviving friends, have not been neglectful in paying due marks of respect to his memory. At Upsal, a general mourning took place on the death of the man whose industry and genius had promoted the interest, and exalted the reputation, of that seminary of literature to the highest pitch. His funeral procession was attended by the whole university, as well professors as students; and the pall was supported by 16 doctors of medicine, all of whom were his own pupils. The Swedish monarch also ordered a medal to be struck to his honour; of which one side exhibits Linnaeus's bust and name; and the other, Cybele in a dejected attitude, holding in her left hand a key, and surrounded with animals and growing plants, with the legend, *Deam luctus augit amissu*; and beneath, *Post obitum, Upsalia, d. x. Jan. MDCCCLXXVIII. Regis jubente*. But an honour never yet conferred on any other learned man in so high a degree, was still reserved to Linnaeus's memory by his king, who, in his speech from the throne, to the late assembly of the states of the kingdom, lamented Sweden's loss by the death of Linnaeus. Nor must we omit mentioning, that, at Edinburgh, Dr Hope, professor of botany, on opening his course of lectures for the ensuing summer, delivered a discourse in honour of this great master of the science which he has there cultivated with so much assiduity and success; and, at the same time, in presence of the students, he laid the foundation-stone of a monument (which has since been erected) to his memory, in the botanical garden at that place. While this monument cannot fail to suggest the merits of Linnaeus to the students, it will also be a mark of respect to his memory from one of his greatest and most sincere admirers.

LINNET, in ornithology. See FRINGILLA.—It is remarkable of this bird, that when it builds in hedges, and when in furze-bushes on heath, in both which places the nests are very common, they are made

made of very different materials. When they build in hedges, they use the slender filaments of the roots of trees, and the down of feathers and thistles; but when they build on heaths they use moss, principally for the outer part, finishing it within with such things as the place will afford. These birds will have young ones three or four times a-year, especially if they are taken away before they are able to leave the nests.

When linnets are to be taught to whistle tunes, or to imitate the notes of any other bird, they must be taken from the old one when they are not above four days old; for at this time they have no idea of the note of the old ones, and will be readily taught to modulate their voice like any thing that is most familiar to their ears, and within the compass of their throats. More care is required in feeding them when taken thus young, than when they are left in the nest till nearly fledged; but they will be reared very well upon a food half bread and half raseded boiled and bruised: this must be given them several times a-day. It must be made fresh every day, and given them sufficiently moist, but not in the extreme. If it be in the least sour, it gripes and kills them; and if too stiff, it is as mischievous by binding them up.—They must be hung up as soon as taken from the nest, under the bird whose note they are intended to learn; or, if they are to be taught to whistle tunes, it must be done by giving them lessons at the time of feeding; for they will profit more, while young, in a few days, than in a long time afterwards, and will take in the whole method of their notes before they are able to crack hard feeds. Some have attempted to learn them to speak in the manner of the parrot or other birds; and they will arrive at some sort of perfection in it, with great pains.

**LINSEED**, the seed of the plant linum—Lintseed bruised and steeped in water gives it very soon a thick mucilaginous nature, and communicates much of its emollient virtue to it. See **LINUM**.

**LINT**. See **FLAX**, **LINEN**, and **LINUM**.

**LINT**, in surgery, is the scrapings of fine linen, used by surgeons in dressing wounds. It is made in to various forms, which acquire different names according to the difference of their figures.—Lint made up in an oval or orbicular form is called a *pledgit*; if in a cylindrical form, or in shape of a date, or olive-stone, it is called a *doffil*.

These different forms of lint are required for many purposes; as, 1. To stop blood in fresh wounds, by filling them up with dry lint before the application of a bandage: though, if scraped lint be not at hand, a piece of fine linen may be torn into small rags, and applied in the same manner. In every large hæmorrhage the lint or rags should be first dipped in some styptic liquor, as alcohol, or oil of turpentine; or sprinkled with some styptic powder. 2. To agglutinate or heal wounds; to which end lint is very serviceable, if spread with some digestive ointment, balsam, or vulnerary liquor. 3. In drying up wounds and ulcers, and forwarding the formation of a cicatrix. 4. In keeping the lips of wounds at a proper distance, that they may not hastily unite before the bottom is well digested and healed. 5. They are highly necessary to preserve wounds from the injuries of the air.—Surgeons of former ages formed compresses of

sponge, wool, feathers, or cotton; linen being scarce: but lint is far preferable to all these, and is at present universally used.

**LINTSTOCK**, in military affairs, a wooden staff about three feet long, having a sharp point in one end, and a sort of fork or crotch on the other; the latter of which serves to contain a lighted match, and by the former the lintstock is occasionally stuck in the ground, or in the deck of a ship during an engagement. It is very frequently used in small vessels, where there is commonly one fixed between every two guns, by which the match is always kept dry, and ready for firing.

**LINTZ**, a very handsome town of Germany, and capital of Upper Austria, with two fortified castles; the one upon a hill, the other below it. Here is a hall in which the states assemble, a bridge over the Danube, a manufacture of gunpowder, and several other articles. It was taken by the French in 1741, but the Austrians retook it in the following year. E. Long. 14. 33. N. Lat. 48. 16.

**LINTZ**, a town of Germany, in the circle of the Lower Rhine, and electorate of Cologne, subject to that elector. It is seated on the river Rhine, in E. Long. 7. 1. N. Lat. 50. 31.

**LINUM**, **FLAX**; a genus of the pentagynia order, belonging to the pentandria class of plants.

*Species.* 1. The *usitatissimum*, or common annual flax, hath a taper fibrous root; upright, slender, unbranched stalks, two feet and a half high; garnished with narrow, spear-shaped, alternate grey-coloured leaves; and the stalks divided into footstalks at top, terminated by small blue crenated flowers in June and July; succeeded by large round capsules of ten cells, containing each one seed. 2. The perenne, or perennial Siberian flax, hath a fibrous perennial root, sending up several upright, strong, annual stalks, branching four or five feet high; garnished with small, narrow, spear-shaped, alternate leaves of a dark-green colour; and terminated by umbellate clusters of large blue flowers in June, succeeded by seeds in autumn. There are 20 other species of linum, but these are the most remarkable.

*Culture.* The first species is cultivated in the fields according to the directions given under the article **FLAX**. The second sort is raised from seed in a bed or border of common garden-earth, in shallow drills six inches asunder; and when the plants are two or three inches high, thin them to the same distance; and in autumn plant them out where they are wanted.

*Uses.* The first species may justly be looked upon as one of the most valuable of the whole vegetable kingdom; as from the bark of its stalks is manufactured the lint or flax for making all sorts of linen-cloth; from the rags of the linen is made paper; and from the seeds is expressed the lintseed oil so useful in painting and other trades. The seeds themselves are esteemed an excellent emollient and anodyne: they are used externally in cataplasms, to allay the pain of inflamed tumours: internally, a slight infusion of lintseed, by way of tea, is recommended in coughs as an excellent pectoral, and of great service in pleuritis, nephritic complaints, and suppressions of urine.

**LINUS**, in classic history, a native of Colchis.



Lion  
||  
Lipari.

cotemporary with Orpheus, and one of the most ancient poets and musicians of Greece. It is impossible, at this distance of time, to discover whether Linus was the disciple of Orpheus, or Orpheus of Linus. The majority, however, seem to decide this question in favour of Linus. According to archbishop Usher, he flourished about 1280 B. C. and he is mentioned by Eusebius among the poets who wrote before the time of Moses. Diodorus Siculus tells us, from Dionysius of Mitylene, the historian, who was cotemporary with Cicero, that Linus was the first among the Greeks who invented verses and music, as Cadmus first taught them the use of letters. The same writer likewise attributes to him an account of the exploits of the first Bacchus, and a treatise upon Greek mythology, written in Pelasgian characters, which were also those used by Orpheus, and by Pronapides the preceptor of Homer. Diodorus says that he added the string *lichanos* to the Mercurian lyre; and ascribes to him the invention of rhythm and melody; which Suidas, who regards him as the most ancient of lyric poets, confirms. Mr Marpurg tells us, that Linus invented cat-gut strings for the use of the lyre, which, before his time, was only strung with thongs of leather, or with different threads of flax strung together. He is said by many writers to have had several disciples of great renown; among whom were Hercules, Thamyris, and, according to some, Orpheus—Hercules, says Diodorus, in learning from Linus to play upon the lyre, being extremely dull and obstinate, provoked his master to strike him; which so enraged the young hero, that, instantly seizing the lyre of the musician, he beat out his brains with his own instrument.

LION, in zoology. See FELIS.

LIONCELLES, in heraldry, a term used for several lions borne in the same coat of arms.

LIP, in anatomy. See there, n° 366. c.

*Hare-LIP*, a disorder in which the upper lip is in a manner slit or divided, so as to resemble the upper lip of a hare, whence the name. See SURGERY.

LIPARA (anc. geogr.), the principal of the islands called *Æolia*, situated between Sicily and Italy, with a cognominal town, so powerful as to have a fleet, and the other islands in subjection to it. According to Diodorus Siculus, it was famous for excellent harbours and medicinal waters. He informs us also, that it suddenly emerged from the sea about the time of Hannibal's death. The name is Punic, according to Bochart; and given it, because, being a volcano, it shone in the night. It is now called *Lipari*, and gives name to nine others in its neighbourhood; viz. Stromboli, Pare, Rotto, Panaria, Saline, Volcano, Fencusa, Alicor, and Ustica. These are called, in general, the *Lipari Islands*. Some of these are active volcanoes at present, though Lipari is not. It is about 15 miles in circumference; and abounds in corn, figs, and grapes; bitumen, sulphur, alum, and mineral waters.

LIPARI, an ancient and very strong town, and capital of an island of the same name in the Mediterranean, with a bishop's see. It was ruined by Barbarossa in 1544, who carried away all the inhabitants into slavery, and demolished the place; but it was rebuilt by Charles V. E. Lon. 15. 30. N. Lat. 38. 35.

LIPOTHYMIA, Fainting, may arise from several causes; as too violent exercise, suppression of the menses or other accustomed evacuations, &c. See (the *Index* subjoined to) MEDICINE.

LIPPA, a town of Hungary, with a castle. It was taken by the Turks in 1552; by the imperialists in 1688; and by the Turks again in 1691; who abandoned it in 1665, after having demolished the fortifications. It is seated on a mountain, in E. Lon. 21. 55. N. Lat. 36. 5.

LIPPE, the capital of a country of the same name in Germany, and the circle of Westphalia. It is seated on a river of the same name, and was formerly the residence of the principal branch of the house of Lippe. It is now in the possession of the king of Prussia, and carries on a good trade in preparing timber for building vessels on the Rhine, with which it has a communication by the river Lippe. The country round it is unwholesome and marshy. E. Long. 8. 12. N. Lat. 51. 43.

LIPSIUS (Justus), a learned critic, was born at Ilich, a small village near Brussels, in 1547. After having distinguished himself in polite literature, he became secretary to cardinal de Granvella at Rome, where the best libraries were open to him; and he spent much labour in collating the MSS. of ancient authors. He lived 13 years at Leyden; during which he composed and published what he esteems his best works; but settled at Louvain, where he taught polite literature with great reputation. He was remarkable for unsteadiness in religion, fluctuating often between the Protestants and Papists; but he became finally a bigotted catholic. He died at Louvain in 1606; and his works are collected in six vols folio.

LIQUIDAMBER, SWEET-GUM-TREE; a genus of the polyandria order, belonging to the monœcia class of plants. There are two species, both of them beautiful deciduous trees, growing 30 or 40 feet high, forming fine pyramidal heads; adorned with large angular and oblong leaves, and monœcious, apetalous, saffron-coloured flowers; and producing a liquid, transparent, gummy substance, of great fragrance. They may be propagated either by seed or layers in the full ground. The seeds must be procured from America, where these trees are natives.

LIQUOR, a name for any fluid substance of the aqueous or spirituous kind.

LIQUOR of *Flints*. See CHEMISTRY, n° 338.

*Smoking LIQUOR* of *Libanus*. See CHEMISTRY, n° 247.

*Mineral Anodyne LIQUOR* of *Hoffman*. This is a composition of highly rectified spirit of wine, vitriolic ether, and a little of the dulcified oil of vitriol. It is made by mixing an ounce of the spirit of wine, which rises first in the distillation of ether, with as much of the liquor which is to be distilled, and afterwards by dissolving in the mixture which rises next, and which contains the ether, 12 drops of the oil which rises after the ether has passed. This has the same virtues with the ether, and is now generally disused, the pure ether being substituted in its place.

LIQUORICE. See GLYCRRHIZA.

LIRIODENDRON, the *TULIP-TREE*; a genus of the polygynia order, belonging to the polyandria class of

Lisbon.

of plants.—There is but one species, viz. the *tulipifera*, a native of America. This rises with a large upright trunk, branching 40 or 50 feet high, having large lobed alternate leaves, of three lobes, the middle one truncated, those of the sides rounded; and from the ends of the branches bell-shaped flowers, composed of six petals in a double series, spotted with green, red, white, and yellow, appearing in July, and succeeded by large conic fruit, not ripening in this country. In the countries of North America where they are natives, these trees are known by the name of *poplar*, and grow to a great size. Mr. Catesby tells us, that in Carolina some are met with of 30 feet in circumference, with irregular and unequal boughs, which distinguish them at a distance, even when they are stripped of their leaves. Their timber is of great use, particularly for making the boats called *periangues*.

LISBON, the capital of the kingdom of Portugal, situated in the province of Estremadura, on the banks of the river Tagus, in W. Long. 9. 25. N. Lat. 38. 25. It was anciently called *Olisippo*, *Olisippo*, and *Ulyssippo*, which are supposed to be derived from the Phenician *Ullisubbo*, or *Olisippo*, signifying, in that tongue, a *pleasant bay*, such as that on which this city stands. It first became considerable in the reign of king Emanuel; from that time it hath been the capital of the kingdom, the residence of its monarchs, the seat of the chief tribunals, and offices of the metropolis, a noble university, and the receptacle of the richest merchandize of the East and West Indies. Its air is excellent; being refreshed by the delightful sea-breezes, and those of the Tagus. The city extends for about two miles along the Tagus; but its breadth is inconsiderable. Like old Rome, it stands on seven hills: but the streets in general are narrow and dirty, and some of them are very steep; neither are they lighted at night. The churches, in general, are very fine; but the magnificence of the chapel-royal is amazing. Here is one of the finest harbours in the world; and there were a great number not only of fine churches and convents here, but also of other public buildings, and particularly of royal palaces, and others belonging to the grandees; but the greatest part of them, and of the city, were destroyed by a most dreadful earthquake, on Nov. 1, 1755, from which it will require a long time to recover. The inhabitants, before the earthquake, did not at all exceed 150,000. The government of it is lodged in a council, consisting of a president, six counsellors, and other inferior officers. The harbour has water enough for the largest ships, and room enough for 10,000 fail without being crowded. For its security, there is a fort at the mouth of the river, on each side, and a bar that runs across it, and is very dangerous to pass without pilots. Higher up, at a place where the river is considerably contracted, there is a fort called *Torre de Belem*, or the *Tower of Belem*, under whose guns all ships must pass in their way to the city; and on the other side are several more forts. Before the earthquake, most of the private houses were old and unfitly, with lattice-windows; and the number of convents and colleges amounted to 50, namely, 32 for monks, and 18 for nuns. The king's principal palace stands on the river, and is large and commodious. Of the hospitals, that called the *Great* is obliged to receive all persons, of what degree, nation, or religion

soever, without exception. At the village of Belem, near Lisbon, is a noble hospital for decayed gentlemen who have served the king, and have not wherewithal to maintain themselves. That called the *house of mercy* is also a noble charity. In the centre of the city, upon one of the highest hills, is the castle, which commands the whole, being large and ancient, and having always a garrison of four regiments of foot. The cathedral is a vast edifice of the Gothic kind, but heavy and clumsy: it contains, however, great riches, and is finely adorned within. The square called *Reyso* is large, and surrounded with magnificent buildings. The whole city is under the ecclesiastical jurisdiction of the patriarch, who was appointed in the year 1717. Here is also an archbishop, who has, or at least had before the erection of the patriarchate, a revenue of 40,000 crusadoes, or 6000*l*. The university, which was removed for some time to Coimbra, but afterwards restored to its ancient seat, makes a considerable figure, though much inferior to that of Coimbra.

LISBURN, a town of Ireland, in the county of Antrim and province of Ulster. It was burnt down about 40 years ago; but is now rebuilt in a neat and handsome manner, and has a large linen manufactory. It is seated on the river Laggan, in W. Long. 6. 20. N. Lat. 54. 31.

LISIEUX, a considerable town of France, in Upper Normandy, with a bishop's see. The churches and religious houses, and the bishop's palace, are all very handsome structures. It is a trading place; and is seated at the confluence of the rivers Arbeck and Gassi, in E. Long. 0. 20. N. Lat. 49. 11.

LISLE, a large, rich, handsome, and strong town of French Flanders, of which it is the capital, with a strong castle, and a citadel built by Vauban, and said to be the finest in Europe, as well as the best fortified. The large square, and the public buildings, are very handsome; and they have manufactures of silks, cambrics, and camblets, as well as other stuffs, which have been brought to great perfection. It was taken by the duke of Marlborough, after three months siege and the loss of many thousands of men, in 1708; but restored to the French by the treaty of Utrecht, in consideration of their demolishing the fortifications of Dunkirk. It is seated on the river Ducle, 14 miles west of Tournay, 32 south-west of Ghent, 37 north-west of Mons, and 130 north of Paris. E. Long. 3. 9. N. Lat. 50. 38.

LISLE (Claudius de), a learned historiographer, born at Vaucouleurs, in 1644. He studied among the Jesuits at Pontamousson; took his degrees in law, and afterwards applied himself intirely to the study of history and geography; and to perfect himself in those sciences went to Paris, where the principal lords of the court became his scholars, and among the rest the duke of Orleans, afterwards regent of the kingdom. He wrote, 1. An historical account of the kingdom of Siam. 2. A genealogical and historical Atlas. 3. An abridgment of universal history. He died at Paris, in 1720.

LISLE (William de), son of the former, and the most learned geographer France has produced, was born at Paris in 1675. He became first geographer to the king, royal censor, and member of the academy of sciences. He died in 1726. He published a great number

Lisburn  
Life.

number of excellent maps, and wrote many pieces in the memoirs of the academy of sciences.

**LISLE** (Sir John), a brave loyalist in the time of the civil wars, was the son of a bookfeller in London, and received his education in the Netherlands. He signalized himself upon many occasions in the civil war, particularly in the last battle of Newbury; where, in the dusk of the evening, he led his men to the charge in his shirt, that his person might be more conspicuous. The king, who was an eye-witness of his bravery, knighted him in the field of battle. In 1648, he rose for his majesty in Essex; and was one of the royalists who so obstinately defended Colchester, and who died for their defence of it. This brave man having tenderly embraced the corps of Sir Charles Lucas, his departed friend, immediately presented himself to the soldiers who stood ready for his execution. Thinking that they stood at too great a distance, he desired them to come nearer: one of them said, "I warrant you, Sir, we shall hit you." He replied, with a smile, "Friends, I have been nearer you when you have missed me." He was executed August 28th 1648.

**LISMORE**, one of the Western islands of Scotland, seated at the mouth of the bay of Lochyol in Argyleshire. It is eight miles long, and two broad; and the soil is pretty fertile. It was formerly the residence of the bishops of Argyle.

**LISSA**, an island in the Gulph of Venice, on the coast of Dalmatia, belonging to the Venetians, where they have a fishery of fardines and anchovies. It produces excellent wine, and is 70 miles west of Ragusa. E. Long. 17. o. N. Lat. 43. 22.

**Lissa**, a town of Poland, in the palatinate of Posen, of which it is the capital. E. Long. 16. o. N. Lat. 32. 15.

**Lissa**, a village of Silesia, 16 miles from Breslau, remarkable for a battle fought between the Prussians and the Austrians on the 15th of December 1757, when the latter were entirely defeated.

**LIST**, in commerce, the border of cloth or stuff; serving not only to shew their quality, but to preserve them from being torn in the operations of fulling, dyeing, &c.—**Lift** is used on various occasions; but chiefly by gardeners for securing their wall-trees.

**List**, in architecture, a little square moulding, otherwise called a *fillet*, *listel*, &c. See Plate XXXIX. fig. 1.

**List**, is also used, to signify the inclosed field or ground wherein the ancient knights held their jousts and combats. It was so called, as being hemmed round with pales, barriers, or stakes, as with a list. Some of these were double, one for each cavalier; which kept them apart, so that they could not come nearer each other than a spear's length. See **Joust**, **Tournament**, **Duel**, &c.

**Civil List**, in the British polity. The expences defrayed by the civil list are those that in any shape relate to civil government; as, the expences of the household; all salaries to officers of state, to the judges, and every one of the king's servants; the appointments to foreign ambassadors; the maintenance of the queen and royal family; the king's private expences, or privy-purse; and other very numerous outgoings, as secret-service money, pensions, and other bounties: which sometimes have so far exceeded the revenues appointed for that purpose, that application has been made to

parliament to discharge the debts contracted on the civil list; as particularly in 1724, when one million was granted for that purpose by the statute 11 Geo. I. c. 17. and in 1769, when half a million was appropriated to the like uses by the statute 9 Geo. III. c. 34.

The civil list is indeed properly the whole of the king's revenue in his own distinct capacity; the rest being rather the revenue of the public, or its creditors, though collected and distributed again in the name and by the officers of the crown: it now standing in the same place, as the hereditary income did formerly; and as that has gradually diminished, the parliamentary appointments have increased. The whole revenue of queen Elizabeth did not amount to more than 600,000*l.* a year: that of king Char. I. was 800,000*l.* and the revenue voted for king Charles II. was 1,200,000*l.* though complaints were made (in the first years at least), that it did not amount to so much. But it must be observed, that under these sums were included all manner of public expences; among which Lord Clarendon, in his speech to the parliament, computed, that the charge of the navy and land-forces amounted annually to 800,000*l.* which was ten times more than before the former troubles. The same revenue, subject to the same charges, was settled on king James II.: but by the increase of trade, and more frugal management, it amounted on an average to 1,500,000*l.* per annum, (besides other additional customs, granted by parliament, which produced an annual revenue of 400,000*l.*) out of which his fleet and army were maintained at the yearly expence of 1,100,000*l.* After the revolution, when the parliament took into its own hands the annual support of the forces both maritime and military, a civil-list revenue was settled on the new king and queen, amounting, with the hereditary duties, to 700,000*l.* per annum; and the same was continued to queen Anne and king George I. That of king Geo. II. was nominally augmented to 800,000*l.* \* See *Revenue*. and in fact was considerably more: but that of his present majesty is expressly limited to that sum; tho' 100,000*l.* has been since added. And upon the whole, it is doubtless much better for the crown, and also for the people, to have the revenue settled upon the modern footing rather than the ancient. For the crown; because it is more certain, and collected with greater ease: for the people; because they are now delivered from the feudal hardships, and other odious branches of the prerogative. And though complaints have sometimes been made of the increase of the civil list, yet if we consider the sums that have been formerly granted, the limited extent under which it is now established, the revenues and prerogatives given up in lieu of it by the crown, the numerous branches of the present royal family, and (above all) the diminution of the value of money compared with what it was worth in the last century, we must acknowledge these complaints to be void of any rational foundation; and that it is impossible to support that dignity, which a king of Great Britain should maintain, with an income in any degree less than what is now established by parliament. See **REVENUE**.

**To List, or Enlist, Soldiers**, to retain and enroll men as soldiers, either as volunteers, or by a kind of compulsion. Persons listed must be carried within four days, but not sooner than 24 hours after, before the next justice of



of peace of any county, riding, city, or place, or chief magistrate of any city or town-corporate (not being an officer in the army); and if before such justice or magistrate they dissent from such enlisting, and return the enlisting-money, and also 20 shillings in lieu of all charges expended on them, they are to be discharged. But persons refusing or neglecting to return and pay such money within 24 hours, shall be deemed as duly listed, as if they had assented thereto before the proper magistrate; and they shall, in that case, be obliged to take the oath, or, upon refusal, they shall be confined by the officer who listed them till they do take it.

LISTER (Dr Martin), an eminent English physician and naturalist, was born in 1638, and educated at Cambridge. He afterwards travelled into France; and at his return practised physic at York, and afterwards at London. In 1683, he was created doctor of physic, and became fellow of the college of physicians in London. In 1698, he attended the earl of Portland in his embassy from king William III. to the court of France; of which journey he published an account at his return, and was afterwards physician to queen Anne. He also published, 1. *Historia animalium Angliæ*, quarto. 2. *Conchyliorum synopsis*, folio. 3. *Cochlearum & limacum exercitatio anatomica*, 4 vols 8vo. 4. Many pieces in the Philosophical Transactions; and other works.

LITANY, a solemn form of supplication to God, in which the priest utters some things fit to be prayed for, and the people join in their intercession, saying, *we beseech thee to hear us, good Lord, &c.* The word comes from the Greek *λειτουργία*, "supplication;" of *λειτουργία*, "I beseech."

At first the use of litanies was not fixed to any stated time, but were only employed as exigencies required. They were observed, in imitation of the Ninevites, with ardent supplications and fastings, to avert the threatening judgments of fire, earthquakes, inundations, or hostile invasions. About the year 400, litanies began to be used in processions, the people walking barefoot, and repeating them with great devotion; and it is pretended, that by this means, several countries were delivered from great calamities. The days on which these were used, were called *rogation days*: these were appointed by the canons of different councils, till it was decreed by the council of Toledo, that they should be used every month throughout the year; and thus by degrees they came to be used weekly on Wednesdays and Fridays, the ancient stationary days for fasting. To these days the rubric of our church has added Sundays, as being the greatest days for assembling at divine service. Before the last review of the common prayer, the litany was a distinct service by itself, and used some time after the morning prayer was over; at present it is made one office with the morning-service, being ordered to be read after the third collect for grace, instead of the intercessional prayers in the daily service.

LITCHFIELD, a city of Staffordshire, in England, situated in W. Long. 1. 40. N. Lat. 52. 43. It stands low, about three miles from the Trent. Its ancient name is said to have been *Licidfeld*, signifying a field of carcases, from a great number of Christians having, as it is pretended, suffered martyrdom

here in the persecution under Dioclesian. Though the bishop has his see here, yet he is denominated of Litchfield and Coventry. It is divided into two parts by a rivulet and a kind of shallow lake, over which are two causeways, with sluices. It is a long straggling place; but has some very handsome houses, and well-paved clean streets. That part on the south side of the rivulet is called the *city*, and the other the *close*, because it is inclosed with a wall and a deep dry ditch. The city is much the largest, and contains several public structures. The cathedral is a very magnificent structure. Its front, or portico, is hardly to be paralleled in England; and it has three spires exceeding lofty. The town is a great thoroughfare to the north-west counties; and is governed by two bailiffs, 24 burgesses, a recorder, a sheriff, a steward and other officers.

LITERARY, any thing belonging to LITERATURE.

LITERARY Property, or Copy-Right. See COPY-Right.

LITERATURE, LEARNING, or Skill in Letters.

LITHANTHRAX, or PIT-Coal, is a black or brown, laminated, bituminous substance; not very easily inflammable, but, when once inflamed, burns longer and more intensely than any other substance. Of this substance three kinds are distinguished by authors. The residuum of the first after combustion is black; the residuum of the second is spongy, and like pounce stone; and the residuum of the third is whitish ashes. Some fossil coal, by long exposure to air, falls into a greyish powder, from which alum may be extracted. Fossil coal by distillation yields, 1. a phlegm or water; 2. a very acid liquor; 3. a thin oil like naphtha; 4. a thicker oil, resembling petroleum, which falls to the bottom of the former, and which rises with a violent fire; 5. an acid concrete salt; 6. an uninflamable earth remains in the retort. These constituent parts of fossil-coal are very similar to those of amber and other bitumens. For the exciting of intense heats, as of furnaces for smelting iron-ore, and for operations where the acid and oily vapours would be detrimental, as the drying of malt, fossil-coals are previously charred, or reduced to coaks; that is, they are made to undergo an operation similar to that by which charcoal is made. By this operation coals are deprived of their phlegm, their acid liquor, and of greatest part of their fluid oil. Coaks therefore consist of the two most fixed constituent parts, the heavy oil and the earth, together with the acid concrete salt, which though volatile is detained by the oil and earth.

LITHARGE, is a kind of refuse of lead, and is no other than that metal in an incipient state of vitrification either alone, or with a mixture of copper. See CHEMISTRY, n<sup>o</sup> 403.

LITHGOW (William), a Scotsman, whose sufferings by imprisonment and torture at Malaga, and whole travels, on foot, over Europe, Asia, and Africa, seem to raise him almost to the rank of a martyr and a hero, published an account of his peregrinations and adventures. Though the author deals much in the marvellous, the horrid account of the strange cruelties of which, he tells us, he was the subject, have, however, an air of truth. Soon after

Lithgow  
Lithospermum.

his arrival in England, from Malaga, he was carried to Theobald's on a feather-bed, that king James might be an eye-witness of his *martyred anatomy*, by which he means his wretched body, mangled and reduced to a skeleton. The whole court crowded to see him; and his majesty ordered him to be taken care of, and he was twice sent to Bath at his expence. By the king's command, he applied to Gondamor, the Spanish ambassador, for the recovery of the money and other things of value which the governor of Malaga had taken from him, and for 1000 pounds for his support. He was promised a full repARATION for the damage he had sustained; but the perfidious minister never performed his promise. When he was upon the point of leaving England, Lithgow upbraided him with the breach of his word in the presence-chamber, before several gentlemen of the court. This occasioned their fighting upon the spot; and the ambassador, as the traveller oddly expresses it, had his fistula (with which disorder he was afflicted) contrabanded with his fist. The unfortunate Lithgow, who was generally condemned for his spirited behaviour, was sent to the Marshalsea, where he continued a prisoner nine months. At the conclusion of the octavo edition of his *Travels* he informs us, that, in his three voyages, "his painful feet have traced over (besides passages of fess and rivers) 36,000 and odd miles, which draweth near to twice the circumference of the whole earth." Here the marvellous seems to rise to the incredible; and to set him, in point of veracity, below Coryat, whom it is nevertheless certain that he far outwalked. His description of Ireland is whimsical and curious. This, together with the narrative of his sufferings, is reprinted in Morgan's *Phoenix Britannicus*.

**LITHIASIS, or STONE.** See (the *Index* subjoined) to MEDICINE.

**LITHONTRIPICUS**, from *λίθος*, "a stone," and *τρῑψω*, "to break;" an epithet for medicines that are said to break the stone in the bladder. Tho' the different stones that are generated in the human bladder require different solvents when out of the body; and though art hath not yet afforded a medicine which, when injected into the bladder, will, without injury thereto, dissolve the stone therein lodged; it cannot thence be concluded, that there are no lithontriptic medicines. It may be here observed, that one solvent affects one subject, but hath no effect on another; so a solvent may yet be met with that will destroy the stone, and not hurt the human body. The water into which the boiled white of egg dissolves will liquify myrrh, but may be put into the human eye without causing any uneasiness.

Soap ley taken at first in small doses in broth that is freed from all its fat, succeeds in most cases which require an alkaline solvent. The patient may begin with 20 drops, and gradually increase the dose as he is able; and by repeating it three times a-day for six, eight, or twelve months, the wished for effects often follow.

**LITHOPHYTA**, the name of Linnæus's third order of vermes. See ZOOLOGY.

**LITHOSPERMUM, GROMWELL**; a genus of the monogynia order, belonging to the pentandria class of plants. There are several species; but the only re-

markable ones are the officinale or common gromwell, and the arvense or bastard alkanet. Both these are natives of Britain; the former growing in dry gravelly soil, the latter in corn-fields.—The seeds of the first are reputed to be of service in calculous cases. Dr Grew says, that they have so much earth in their composition, that they effervesce with acids; but if this is the case, it must be attributed rather to an alkaline than an earthy quality.

**LITHOTOMY**, in surgery, the operation of cutting for the stone. See SURGERY.

**LITHUANIA**, an extensive province of Poland. By the natives it is called *Letawa*, and has Great Poland and Russia on the west; part of Muscovy on the east; Livonia, the Baltic sea, and part of Muscovy, on the north; Red Russia, Volhinia, and Padolia, on the south; and the Ukraine on the south-east. Its length is said to be about 360, and its breadth 340 miles; but it is much indented both ways. Lithuania was anciently over-run with wood; and there are still many forests in it, which yield a great deal of honey, wax, pitch, tar, and timber; and abound with wild boars, buffalos, elks, wild horses, wild asses, uri, and woodcocks. The lakes are also numerous, and well-stored with fish: but the air, by reason of these forests and lakes, is said to be thick and foggy. The country produces a great deal of buck-wheat and other corn, the pastures are luxuriant, and the flocks and herds numerous: so that, notwithstanding agriculture is much neglected, provisions are exceeding cheap, but money so scarce, that ten per cent is the common interest. The principal nobility have large estates, and live in great pomp and splendor, generally retaining some hundreds of those that are poor, in quality of domestics. The established religion is Popery; but Lutherans, Calvinists, Jews, Turks, Greeks, and Socinians, are very numerous. Lithuania was governed by its own dukes till it was united to Poland, towards the end of the 14th century, when the great duke Jagello married Hedwig, the dowager of Lewis king of Poland and Hungary. It had even dukes after that, but they were subordinate to the king; and at this day, tho' one diet serves for both countries, yet each has its peculiar laws, customs, dialect, and privileges. In a diet held at Lublin in 1569, it was more closely united to Poland than it had been before; and it was enacted, that both countries, for the future, should form but one state under the same prince. As to their courts of justice, the tenth part of what is adjudged in all real actions goes always to the judge's box, and is immediately paid in court; and in personal actions he claims half the damages given. A nobleman is only fined for murder, as in Poland. The common people here, excepting the burghers in the royal towns, and the Germans, are slaves; and, in many places, the ignorant vulgar still retain some remains of idolatry. The poor people have only Mondays to themselves; and if their lords have occasion for them even on that day, the peasant must work for himself on Sunday. If any of them is condemned to death by his lord, he must execute himself, or suffer greater cruelty. The dialect is a language of the Sclavonic; and they speak here, as in Poland, a barbarous kind of Latin. Lithuania is divided into nine palatinates. Another division is into Lithuania properly so called,

Lithotomus  
Lithuanus.

*Litotes* ed, and Lithuanian Ruffia. Some alfo comprehend under it Samogitia and Courland, which is a fief of Poland.

*LITOTES.* See *ORATORY*, n<sup>o</sup> 55.

*LITTER*, a parcel of dry old ftraw put on the floor of a horfe's ftall for him to lie down and reft upon. When a horfe comes tired into a ftall, frefh litter has the virtue of making him ftale immediately. This is known to be a very great advantage to a horfe in a tired ftate; and when the litter is old and dirty, it never has any fuch effect upon him. If the owners knew how refrefhing it is for a horfe to difcharge his urine on his return from labour, they would be more careful of giving them all means and occafions of it than they do. This ftaling after fatigue prevents thofe obftructions in the neck of the bladder or urinary paffages which horfes are too fubject to. The bladder being often inflamed by the long retention of the heated urine in it, the creature is thus in danger of perifhing.

*LITTLE* (William), an ancient Englifh hiftorian, known alfo by the name of *Gualelmus Neubrigenfis*, was born at Bridlington in the county of York, in the year 1136; and educated in the abbey of Newborough in the fame county, where he became a monk. In his advanced years, he compofed a hiftory of England, in five books, from the Norman conqueft to A. D. 1197; which for veracity, regularity of difpofition, and purity of language, is one of the moft valuable productions of this period.

*LITTLETON* (Sir Thomas), judge of the Common-pleas, was the eldeft fon of Thomas Weftcote, efq. of the county of Devon, by Elizabeth, fole heirefs of Thomas Littleton of Frankley in Worcefterfhire, at whose request he took the name and arms of that family. He was educated at one of our univerfities, probably at Cambridge. Thence he removed to the Inner Temple, where he became one of the readers; and was afterwards, by Henry VI. made fteward or judge of the court of the palace, or manfion of the king's houfehold. In 1455, the thirty-third of that reign, he was appointed king's ferjeant, and rode the northern circuit as judge of affize. In 1462, the fecond of Edward IV. he obtained a pardon from the crown; and, in 1466, was appointed one of the judges of the common-plea, and rode the Northamptonfhire circuit. In the year 1475 he was, with many of the firft nobility, created knight of the Bath. He died in 1481; and was buried in the cathedral church of Worcefter, where a marble tomb, with his ftatue upon it, was erected to his memory. As to his character as a lawyer, it is fufficient to inform the reader that he was the author of the *Treatife upon Tenures*, on which Sir Edward Coke wrote a comment, well known by the title of *Coke upon Littleton*.

*LITTLETON* (Adam), defcended from an ancient family in Shropfhire, was born in 1627, educated at Weftminfter-fchool, and went to Oxford a ftudent of Chrift-church, whence he was ejectioned by the parliament vifitors in 1648. Soon after, he became ufher of Weftminfter-fchool, and in 1658 was made fecond mafter of Weftminfter-fchool. After the reftoration he taught a fchool at Chelfea in Middlefex, of which church he was admitted rector in the year 1664. In 1670 he accu[m]ulated the degrees in divinity, being

then chaplain in ordinary to his majefty. In 1674 he became prebendary of Weftminfter, of which church he was afterward fub-dean. Befide he well-known *Latin* and *Englifh* dictionary, he publifhed feveral other works. He died in 1694, and was interred at Chelfea. He was an univerfal fcholar; and extremely charitable, humane, and eafy of accels.

*LITURGY*, a name given to thofe fet forms of prayer which have been generally ufed in the Chriftian church. Of thefe there are not a few afcribed to the apoftles and fathers, but they are almoft univerfally believed to be fpurious. The word comes from the Greek *Λειτουργία*, *ſervice*, or public miniftry.

The liturgy of the church of England was compofed in the year 1547, fince which time it has undergone feveral alterations; the laft of which was in the year 1661, and of this liturgy Dr Comber gives the following character. "No church was ever bleffed with fo comprehensive, fo exact, and fo inoffenfive a liturgy as ours: which is fo judiciously contrived, that the whole may exercife at once their knowledge and devotion; and yet fo plain, that the moft ignorant may pray with underftanding; fo full, that nothing is omitted, which ought to be afked in public; and fo particular, that it comprehends moft things which we would afk in private; and yet fo fhort, as not to tire any that have true devotion. Its doctrine is pure and primitive; its ceremonies fo few and innocent, that moft of the Chriftian world agree in them: its method is exact and natural; its language fignificant and perfpicuous, moft of the words and phrafes being taken out of the holy fcriptures, and the reft are the expreffions of the firft and pureft ages."—And in the opinion of the moft impartial and excellent Grotius, (who was no member of, nor had any obligation to, this church) "the Englifh liturgy comes fo near the primitive pattern, that none of the reformed churches can compare with it." Again, he fays, "In the prayers, a fcholar can difcern clofe logic, pleafing rhetoric, pure divinity, and the very marrow of the ancient doctrine and difcipline; and yet all made fo familiar, that the unlearned may fafely fay Amen."

*LITUUS*, in Roman antiquity, a fhort, ftraight rod, only bending a little at one end, ufed by the augurs. See *Augur*.

*LIVADIA*, anciently *Achaia* and *Hellas*, or *Greece* properly fo called; a province of Turkey in Europe, bounded on the north by Epirus and Theffaly, from which it is feparated by mount Oeta, now Banina, and by the Euripus, now the ftrait of Negropont; on the eaft, by the Archipelago; on the fouth, by the gulf of Engia or Egina, the ifthmus of Corinth, and the gulf of Lepanto; and on the weft, by the Ionian fea and part of Epirus. Its extent is about 130 miles from north-weft to fouth-eaft; but its greateft breadth is not above 36 miles. It is in general a mountainous country; but neither unpleafant nor unfruitful. The principal mountains are, mount Oeta in Bzotia, where is the famous pafs of Thermopylae, not above 25 feet broad; and Parnaffus, Helicon, and Cytheron in Phocia, which were fared to Apollo and the mufes, and confequently much celebrated by the poets. The rivers of moft note are, the Sionapro, anciently the Achelous, the Cephalus, the Ifmenus, and the Alopus. The province



*Livadia, Liver.* province is at present divided into Livadia proper, Stramulippa, and the duchy of Athens. The principal places are, Lepanto, anciently Naupauctus; Livadia, anciently Libadia or Lebadia; the celebrated city of Athens, now Setines; Thebes, now Stibes; Lepsinia, anciently Eleusis; Castri, formerly Delphi; and Megara.

**LIVADIA**, an ancient town of Turkey in Europe, and capital of a province of the same name in Greece. It is a large and populous place, seated on the gulf of Lepanto, about 25 miles from the city of that name. It has now a considerable trade in woollen stuffs and rice. Anciently it was celebrated for the oracle of Trophonius, which was in a cavern in a hill above the town. E. Long. 23. 29. N. Lat. 38. 40.

**LIVER**, in anatomy. See there, n° 357.—Plato, and other of the ancients, fix the principle of love in the liver; whence the Latin proverb, *Cogit amare jecur*: and in this sense Horace frequently uses the word, as when he says, *Si torrete jecur quæris Idoneum*.—The Greeks, from its concave figure, called it *παρα*, vaulted, suspended; the Latins call it *jecur*, q. d. *juxta cor*, as being near the heart. The French call it *foye*, from *foyer*, *focus*, or fire-place; agreeable to the doctrine of the ancients, who believed the blood to be boiled and prepared in it.—Erasistratus, at first, called it *parenchyma*, i. e. *effusion*, or *mass* of blood: and Hippocrates, by way of eminence, frequently calls it the *hypochondrium*.

**LIVER of Antimony.** See CHEMISTRY, n° 459.

**LIVER of Arsenic**, is a combination of white arsenic with liquid fixed vegetable alkali, or by the humid way. Arsenic has in general a strong disposition to unite with alkalis. Mr Macquer, in his *Memoirs upon Arsenic*, mentions a singular kind of neutral salt, which results from the union of arsenic with the alkaline basis of nitre, when nitre is decomposed, and its acid is disengaged in close vessels, by means of arsenic. To this salt he has given the name of *neutral arsenical salt* \*. The liver of arsenic mentioned also by that chemist, although composed, like the neutral arsenical salt, of arsenic and fixed alkali, is nevertheless very different from that salt.

The operation for making liver of arsenic is easy and simple. To strong and concentrated liquid fixed alkali, previously heated, fine powder of white arsenic must be added. This arsenic easily disappears and dissolves, and as much of it is to be added till the alkali is saturated, or has lost its alkaline properties, although it is still capable of dissolving more arsenic superabundantly. While the alkali dissolves the arsenic in this operation, it acquires a brownish colour, and a singular and disagreeable smell; which, however, is not the smell of pure arsenic heated and volatilized. Lastly, this mixture becomes more and more thick, and at length of a gluey consistence. This matter is not crystallizable as the neutral arsenical salt is. It is easily decomposed by the action of fire, which separates the arsenic. This does not happen to the arsenical salt. Any pure acid is capable of separating arsenic from the liver of arsenic, in the same manner as they separate sulphur from liver of sulphur: whereas the neutral arsenical salt cannot be decomposed but by means of the united affinities of acids and metallic substances. Thus we see that arsenic may be combined with fixed

alkali in two very different manners.

The author has given to this combination the name of *liver of arsenic*, to distinguish it from the neutral arsenical salt, and in imitation of the name of the *liver of sulphur*, given to the combination of the fixed alkali with sulphur.

**LIVER of Sulphur.** See CHEMISTRY, n° 321.

**LIVER-Wort**, in botany. See LICHEN.

**LIVERPOOL**, **LITHERPOOL**, or *Lirpool*, a flourishing maritime town of Lancashire; in England, situated at the mouth of the river Mersee, which abounds with salmon, cod-fish, turbot, plaice, smelts, and founders, and at high-water is above two miles over. The town was incorporated by king John; and is governed by a mayor, recorder, aldermen without limitation, 40 common council-men, and burgesses, the number of whom exceeds 1500. The freemen of Liverpool have the same privileges at Bristol in England, and at Waterford and Wexford in Ireland. The town is well-built, and very populous; and in commerce rivals, if it does not exceed, that of Bristol. It lies in a central situation between the coast of Wales, Ireland, Scotland, and the Isle of Man; besides its standing very convenient for an inland trade with Cheshire, Staffordshire, and other parts of the north of England. Besides the Mersee, there is the fourth chanuel, or river Weaver, which is navigable, and chiefly used for the inland conveyance of Cheshire cheese and rock-salt. This kind of salt is dug in Lancashire and Cheshire, and from thence sent all over England. When boiled in sea-water and evaporated, a very strong salt is produced, which may be used in curing herrings. W. Long. 2. 30. N. Lat. 53. 45.

**LIVERY**, in matters of dress and equipage, a certain colour and form of dress, by which noblemen and gentlemen choose to distinguish their servants.

**LIVERY of Seisin**, in law, signifies delivering the possession of lands, &c. to him who has a right to them.

**LIVERYMEN** of London, are a number of men chosen from among the freemen of each company. Out of this body the common-council, sheriff, and other superior officers for the government of the city, are elected; and they alone have the privilege of giving their votes for members of parliament, from which the rest of the citizens are excluded.

**LIVONIA**, a large province of the Russian empire, with the title of a duchy. It is bounded on the north by the gulph of Finland, on the west by that of Riga, on the south by Courland, and on the east, partly by Plefcow, and partly by Novogorod. It is about 250 miles from north to south, and 150 from east to west. The land is so fertile in corn, that it is called the *granary of the North*; and would produce a great deal more, if it was not so full of lakes. The fish that abound here are salmon, carps, pikes, flat fish, and many others. In the forests there are wolves, bears, elks, rein-deer, stags, and hares. The domestic animals are very numerous; but the sheep bear very bad wool. Here are a great number of forests, which consist of birch-trees, pines, and oaks; and all the houses of the inhabitants are built with wood. The merchandizes which they send abroad are flax, hemp, honey, wax, leather, skins, and potashes. The Swedes were formerly possessed of this province, but were obliged to abandon it to the Russians after the battle of

\* See Chemistry, n° 460.

of Pultowa; and it was ceded to them by the peace of the North, concluded in 1722, which was confirmed by another treaty in 1742. It is divided into two provinces, viz. Letonia and Estonia; and two islands called *Oesel* and *Dagbo*, which are again subdivided into several districts.

**LIVONICA TERRA**, a kind of fine bole used in the shops of Germany and Italy. It is found in Livonia, from whence it takes its name, and also in some other parts of the world. It is generally brought to us in little cakes, sealed with the impression of a church and an escutcheon, with two crosses keys.

**LIVRE**, a French money of account, containing 20 sols. See *MONEY-Table*.

**LIXIVIOUS**, an appellation given to salts obtained from burnt vegetables by pouring water on their ashes.

**LIXIVIUM**, in pharmacy, &c. a ley obtained by pouring some liquor upon the ashes of plants; which is more or less powerful, as it has imbibed the fixed salts contained in the ashes.

**LIZARD**, in zoology. See *LACERTA*.

**LIZARD**, in geography, a cape or promontory of Cornwall, situated according to the most common computation, in W. Long. 5. 47. N. Lat. 49. 50.

**LLOYD** (Nicholas), a learned English writer in the 17th century, was born in Flintshire in England, and educated at Wadham college, Oxford. He was rector of Newington St Mary near Lambeth, in Surry, till his death, which happened in 1680. His *Dictionary Historicum* is a valuable work, to which Hoffman and Moreri are greatly indebted.

**LLOYD** (William), a most learned English writer and bishop, was born in Berkshire in England, in 1627. He was educated under his father, rector of Sonning, and vicar of Tyle-hurst in Berkshire; then went to Oxford, and took orders. In 1660, he was made prebendary of Rippon; and in 1666, chaplain to the king. In 1667, he took the degree of doctor of divinity; in 1672, he was installed dean of Bangor; and in 1680, was consecrated bishop of St Asaph. He was one of the six bishops who, with archbishop Sancroft, were committed prisoners to the tower of London, for subscribing a petition to the king against distributing and publishing his declaration for liberty of conscience. Soon after the revolution he was made almoner to king William and queen Mary: in 1692, he was translated to the bishopric of Litchfield and Coventry; and in 1699, to the see of Worcester, where he sat till his death, which happened in 1717, the 91st year of his age. Dr Burnet gives him an exalted character, and his works are highly esteemed.

**LOACH**, in ichthyology. See *COBITIS*.

**LOADSTONE**. See *MAGNET*.

**LOAMS**, in natural history, are defined to be earths composed of dissimilar particles, stiff, dense, hard, and rough to the touch; not easily broke while moist, readily diffusible in water, and composed of sand and a tough viscid clay. Of these loams some are whitish and others brown or yellow.

**LOAN**, any thing given to another, on condition of return or repayment.

*Public Loans*. See *FUNDS*, and *NATIONAL Debt*.

**LOANDA**, a province of the kingdom of Angola in Africa. It is an island about 15 miles in length, and three in breadth; remarkable chiefly for the capi-

tal of Angola situated upon it, in E. Long. 12. 25. S. Lat. 8. 45. This town was built by the Portuguese in 1578, under the direction of the first Portuguese governor in these parts. It is large, populous, and pleasantly seated on the declivity of a hill near the sea-coast, and facing the south-west. The island is supplied with fresh water from wells dug in it; and which are not sunk below the depth of three feet when they are filled with excellent water. It is remarkable, however, that the water of these wells continues good only during the time of high-tide; for, as that sinks, the water becomes more and more brackish, till at last it is quite salt, almost as much as the sea itself. On the coast of this island are fished the zimbis, or shells used in several parts of Africa, instead of money; and with these shells, instead of coin, is carried on a great part of the traffic of this country.

**LOANGO**, a kingdom of Africa, extending itself about 180 geographical miles in length from south to north; that is, from cape St Catherine under the second degree of south latitude, to a small river called *Lovanda Louisa*, on the 5th degree of the same. From west to east it extends from Cape Negro on the coast of Ethiopia towards the *Buchumalean* mountains, so called on account of their vast quantity of ivory and great droves of elephants, about 300 miles. It is divided into four principal provinces, viz. those of *Lo-vangiri*, *Loango-mongo*, *Chilongo*, and *Piri*.

The inhabitants are very black, well-shaped, and of a mild temper. The men wear long petticoats, from the waist downwards; and have round their waist a piece of cloth, half an ell or a quarter broad, over which they wear the skin of a leopard, or some other wild beast, hanging before them like an apron. On their head they wear a cap made of grass, and quilted, with a feather a-top of it; and on their shoulder, or in their hand, they carry a buffalo's tail, or drive away the musketos. The women's petticoats are made only of straw, about an ell square, with which they cover their privities, but leave the greatest part of their thighs and buttocks bare: the rest of their body is quite bare, except that on their legs they wear little strings of beads made of shells, and small bracelets of ivory on their arms. They anoint themselves with palm-oil, mixed with a kind of red wood reduced to powder.

This country abounds with poultry, oxen, cows, sheep, goats, elephants, tigers, leopards, civet-cats, and other animals; so that here are great quantities of elephants teeth, and fine furs, to be traded for.

The capital city, where the king resides, is called *Loango*, or *Banza-Loangeri*, and, in the language of the negroes, *Boaric*. This city is situated in 4° S. Lat. and a half, a league and a half from the sea-coast. It is a pretty large city, shaded and adorned with bananas, palm, and other trees. The king, who resides in a large palace in the middle of it, has about 1500 concubines. If any of them is surprised in adultery, she and her paramour are instantly conveyed to the top of a very high hill, whence they are hurled down headlong from the steepest place.

Every man marries as many wives here as pleases, who are obliged to get their husbands livelihood, as is the practice all along the African coast inhabited by blacks. The women therefore cultivate the land, sow and

Lobe  
Lochaber.

and reap, while the lazy husbands loiter away their time in idleness.

The king's revenue consists in elephants teeth, copper, and a kind of petticoats made of palm-tree leaves, and called *lavogus*: he has whole store-houses full of these *lavogus*; but his greatest riches consist in slaves of both sexes.

LOBE, in anatomy, any fleshy protuberant part, as the lobes of the lungs, the lobes of the ears, &c.

LOBELIA, CARDINAL-FLOWER; a genus of the monogamia order, belonging to the syngenesia class of plants. There is a great number of species, but only four of them are cultivated in our gardens; two of which are hardy herbaceous plants for the open ground, and two shrubby plants for the stove. They are all fibrous rooted perennials, rising with erect stalks from two to five or six feet high, ornamented with oblong, oval, spear-shaped, simple leaves; and spikes of beautiful monopetalous, somewhat ringent, five-parted flowers, of scarlet, blue, and violet colours. They are easily propagated by seeds, offsets, and cuttings of their stalks. The tender kinds require the common treatment of other exotics. They are natives of America; from which their seeds must be procured.

LOBINEAU (Guy Alexis), a Benedictine monk, born at Rennes in 1666, spent his whole life in the study of history, and the writing of several works; the principal of which are, The history of Britany, 2 vols folio; and A continuation of Felibien's history of Paris, 9 vols folio. He died in 1727.

LOBO (Rodriguez Francis), a celebrated Portuguese poet, was born at Leiria, a small town of Estramadura. He wrote an heroic poem, some eclogues, and a piece entitled *Euphrosyne*, which is the favourite comedy of the Portuguese. His works were collected and printed together in Portuguese in 1721, in folio. He flourished about 1610.

LoBO (Jerome), a famous Portuguese Jesuit, born at Lisbon, went into Ethiopia, and dwelt there for a long time. At his return he was made rector of the college of Coimbra, where he died in 1678. He wrote An historical account of Abyssinia, which is by some esteemed a very accurate performance.

LOBSTER, in zoology, a species of cancer. See CANCER.

LOCAL, in law, something fixed to the freehold, or tied to a certain place: thus, real actions are local, since they must be brought in the country where they lie; and local customs are those peculiar to certain countries and places.

LOCAL Medicines, those destined to act upon particular parts; as fomentations, epithems, vesicatories, &c.

LOCARNO, a town of Switzerland, capital of a bailiwick of the same name, seated at the north end of the lake Maggiore, near the river Magie. It carries on a great trade; and the country abounds in pastures, wine, and fruits. E. Long. 8. 41. N. Lat. 46. 6.

LOCATELLUS's BALSAM. See PHARMACY, n° 890.

LOCHABER, a district of the shire of Inverness in Scotland. It is bounded on the north by Badenoch, by Athol on the east, by Lorn and Braidalbin on the south, and by a mountainous ridge on the west

towards the sea-shore. It derives its name from the lake, or loch, Aber; and extends about 20 miles from east to west, and 30 from north to south. The country is barren, bleak, mountainous, and rugged. In one of the most barren parts of this country, near the mouth of the river Aber, in the centre between the West and North Highlands, stands Fort-William, with the town of Maryburgh, built upon a navigable arm of the sea, not far from the foot of a very high mountain, called *Benevit*. The town, designed as a futlery for the garrison, was erected into a borough; and the fort itself was designed as a check upon the clan Cameron, who had been guilty of depredations and other irregularities. It is inhabited mostly by the Macdonalds, Camerons, and Mackintoshes; who are not the most civilized people in Scotland, though their chiefs are generally persons of education, honour, and hospitality. Macdonald of Glengary, descended in a straight line from Donald of the Isles, possessed a feat or cattle in this district, which was burned to the ground, and destroyed in the year 1715, in consequence of his declaring for the pretender. The elegant house and gardens belonging to Cameron of Lochiel underwent the same fate, for the same reason, after the extinction of the rebellion in the year 1746. The cadets of these families, which have formed a kind of inferior gentry, are lazy, indigent, and uncleanly; proud, ferocious, and vindictive. The common people, though celebrated for their bravery, fidelity, and attachment to their chiefs, are counted very savage, and much addicted to rapine. They speak the Erse language, and conform to the customs we have described as peculiar to the Highlanders. They pay very little attention to any sort of commerce, but that which consists in the sale of their black cattle, and lead a sort of vagrant life among the hills; hunting, fowling, and fishing, as the seasons permit, and as their occasions require. They delight in arms, which they learn to handle from their infancy; submit patiently to discipline in the character of soldiers; and never fail to signalize themselves in the field by their sobriety, as well as their valour. While they remain in their own country, nothing can be more penurious, mean, sordid, and uncomfortable, than the way of life to which these poor people are inured, whether we consider their dress, diet, or lodging. In point of provision, they are so improvident, or ill supplied, that, before the winter is over, whole families are in danger of starving. In this emergency, they bleed their miserable cattle, already reduced to skin and bone, and eat the blood boiled with oatmeal. This evacuation, added to their former weakness, enfeebles the cows to such a degree, that, when they lie down, they cannot rise again without assistance.

LOCHIA, in midwifery, a flux from the uterus consequent to delivery. See MIDWIFERY.

LOCK, a well-known instrument used for fastening doors, chests, &c. generally opened by a key.

LOCKE (John), a most eminent English philosopher and writer in the latter end of the 17th century, was son of Mr John Locke of Pensford in Somersetshire, and born at Wrington near Bristol in 1632. He was sent to Christ-church in Oxford; but was highly dissatisfied with the common course of studies then pursued in the university, where nothing was taught but the Aristotelian

Lochaber  
Locke.



teian philosophy; and had a great aversion to the disputes of the schools then in use. The first books which gave him a relish for philosophy, were the writings of Des Cartes: for though he did not always approve of his notions, yet he thought he wrote with great perspicuity. He applied himself with vigour to his studies, particularly to physics, in which he gained a considerable knowledge, though he never practised it. In 1694, he went to Germany as secretary to Sir William Swan, envoy from the English court to the elector of Brandenburg and some other German princes. In less than a year, he returned to England; where, among other studies, he applied himself to that of natural philosophy, as appears from a register of the changes of the air, which he kept at Oxford from June 24. 1666, to March 28. 1667. There he became acquainted with the lord Ashley, afterwards earl of Shaftesbury, who introduced him into the conversation of some of the most eminent persons of that time. In 1670, he began to form the plan of his *Essay on Human Understanding*; but his employments and avocations prevented him from finishing it then. About this time he became a member of the Royal Society. In 1672, his patron, now earl of Shaftesbury, and lord chancellor of England, appointed him secretary of the presentations, which place he held till the earl resigned the great seal. In 1673, he was made secretary to a commission of trade, worth 500l. a-year; but that commission was dissolved in 1674. The earl of Shaftesbury being restored to favour, and made president of the council in 1679, sent for Mr Locke to London: but that nobleman did not continue long in his post, being first prisoner to the tower; and after his discharge, retired to Holland in 1682.

Mr Locke followed his patron thither. He had not been absent from England a year, when he was accused at court of having written certain tracts against the government, which were afterward discovered to be written by another person; and in November 1684, he was deprived of his place of student in Christ-church. In 1685, the English envoy at the Hague demanded him and 83 other persons to be delivered up by the States General: upon which he lay concealed till the year following; and during this time formed a weekly assembly with Mr Limborch, Mr Le Clerc, and other learned men at Amsterdam. In 1689, he returned to England in the fleet which conveyed the prince of Orange; and endeavoured to procure his restoration to his place of student of Christ-church, that it might appear from thence that he had been unjustly deprived of it: but when he found the college would admit him only as a supernumerary student, he desisted from his claim.

Being esteemed a sufferer for revolution-principles, he might easily have obtained a more profitable post; but he contented himself with that of commissioner of appeals, worth 200l. a-year, which was procured for him by the Lord Mordaunt, afterwards earl of Monmouth, and next of Peterborough. About the same time he was offered to go abroad in a public character; and it was left to his choice, whether he would be envoy at the court of the emperor, that of the elector of Brandenburg, or any other where he thought the air most suitable to him: but he waved all these,

on account of the infirm state of his health; which disposed him gladly to accept another offer that was made by Sir Francis Masham and his lady, of an apartment in their country-seat at Oates in Essex, about 25 miles from London.

This place proved so agreeable to him in every respect, that it is no wonder he spent the greatest part of the remainder of his life at it. The air restored him almost to a miracle, in a few hours after his return at any time from the town, quite spent and unable to support himself. Besides this happiness here, he found in lady Masham a friend and companion exactly to his heart's wish; a lady of a contemplative and studious complexion, and particularly inured, from her infancy, to deep and refined speculations in theology, metaphysics, and morality. In this family Mr Locke lived with as much ease as if the whole house had been his own: and he had the additional satisfaction of seeing this lady breed up her only son exactly upon the plan which he had laid down for the best method of education; the success of which was such as seemed to give a sanction to his judgment in the choice of that method. In effect, it is to the advantage of this situation, that he derived so much strength, as to continue exerting those talents which the earl of Shaftesbury had observed to be in him for political subjects. Hence we find him writing in defence of the Revolution in one piece; and considering the great national concern at that time, the ill state of the silver-coin, and proposing remedies for it, in others. Hence he was made a commissioner of trade and plantations in 1695, which engaged him in the immediate business of the state; and with regard to the church, he published a treatise the same year, to promote the scheme which king William had much at heart, of a comprehension with the dissenters. This, however, drew him into one controversy; which was scarcely ended, when he entered into another in defence of his essay, which held till 1698: soon after which the asthma, his constitutional disorder, increasing with his years, began to subdue him; and he became so infirm, that in 1700 he resigned his seat at the board of trade, because he could no longer bear the air of London sufficient for a regular attendance upon it. After this resignation, he continued altogether at Oates; in which retirement he employed the remaining last years of his life entirely in the study of the holy Scriptures.

He died in 1704, aged 73. His writings will immortalize his name. The earl of Shaftesbury, author of the *Characteristicks*, though in one place he speaks of Mr Locke's philosophy with severity; yet observes, concerning his *Essay on the Human Understanding*, in general, "that it may qualify men as well for business and the world, as for the sciences and the universal verity." Whoever is acquainted with the barbarous state of the philosophy of the human mind, when Mr Locke undertook to pave the way to a clear notion of knowledge, and the proper methods of pursuing and advancing it, will be surprised at this great man's abilities; and plainly discover how much we are beholden to him for any considerable improvements that have been made since. His *Discourses on Government*, *Letters on Toleration*, and his *Commentaries on some of St Paul's epistles*, are justly held in the highest esteem.

**LOCKED JAW.** See (the *Index* subjoined to) **MEDICINE.**

**LOCKMAN**, an officer in the Isle of Man, who executes the orders of government, much like our under-sheriff.

**LOCKMAN**, an eastern philosopher. See **LOKMAN.**

**LOCUS GEOMETRICUS**, denotes a line by which a local or indeterminate problem is solved.

A *locus* is a line, any point of which may equally solve an indeterminate problem. Thus, if a right line suffice for the construction of the equation, it is called *locus ad rectum*; if a circle, *locus ad circulum*; if a parabola, *locus ad parabolam*; if an ellipse, *locus ad ellipsin*: and so of the rest of the conic sections.

**LOCULAMENTA**, and **LOCULI**, in botany; cells or pockets: The internal divisions of a capsule, or other dry seed-vessel, so termed.—These cells contain or inclose the seeds; and are different in number in different plants.

The term **LOCULUS** is also sometimes used to express the minute divisions in some species of *antheræ*, which contain the fine impalpable powder suppled by the sexualists to be the principal agent in the generation of plants.

**LOCUST**, in zoology. See **GRYLLUS**, and Plate **CXL.**

The annals of most of the warm countries are filled with accounts of the devastations produced by the locusts, who sometimes make their appearance in clouds of two or three miles in length, and several yards deep. They seldom visit Europe in such swarms as formerly; yet in the warmer parts of it are still formidable.—Those which have at uncertain intervals visited Europe in our memory, are supposed to have come from Africa, and are of that species called the *great brown locust*. This insect is about three inches long, and has two horns or feelers an inch in length. The head and horns are of a brownish colour; it is blue about the mouth, as also on the inside of the larger legs. The shield which covers the back is greenish; and the upper-side of the body brown, spotted black, and the under-side purple. The upper-wings are brown, with small dusky spots, and one larger spot at the tips. The under-wings are more transparent, and of a light brown tinged with green, but there is a dark cloud of spots near the tips.

These insects are bred in the warm parts of Asia and Africa, from whence they have often taken their flight into Europe, where they committed terrible devastations. They multiply faster than any other animal in the creation, and are truly terrible in the countries where they breed. Some of them were seen in different parts of Britain in the year 1748, and great mischiefs were apprehended: but happily for us, the coldness of our climate, and the humidity of our soil, are very unfavourable to their production; so that, as they are only animals of a year's continuance, they all perish without leaving a young generation to succeed them.

When the locusts take the field, as we are assured, they have a leader at their head, whose flight they observe, and pay a strict regard to all his motions. They appear at a distance like a black cloud, which, as it approaches, gathers upon the horizon, and almost hides the light of day. It often happens, that the

husbandman sees this imminent calamity pass away without doing him any mischief; and the whole swarm proceeds onward to settle upon some less fortunate country. In those places, however, where they alight, they destroy every green thing, stripping the trees of their leaves, as well as devouring the corn and grafs. In the tropical climates they are not so pernicious as in the more southern parts of Europe. In the first, the power of vegetation is so strong, that an interval of three or four days repairs the damage; but in Europe this cannot be done till next year. Besides, in their long flights to this part of the world, they are fatigued by the length of their journey, and are therefore more voracious wherever they happen to settle. But as much damage is occasioned by what they destroy, as by what they devour. Their bite is thought to contaminate the plant, and either to destroy or greatly to weaken its vegetation. To use the expression of the husbandmen, they burn whatever they touch, and leave the marks of their desolation for three or four years ensuing. When dead, they infect the air in such a manner that the stench is insupportable.—Orosius tells us, that, in the year of the world 3800, Africa was infested with a multitude of locusts. After having eaten up every thing that was green, they flew off and were drowned in the sea; where they caused such a stench as could not have been equalled by the putrefying carcases of 100,000 men.

In the year 1650, a cloud of locusts was seen to enter Russia in three different places; and from thence they spread themselves over Poland and Lithuania in such astonishing multitudes, that the air was darkened and the earth covered with their numbers. In some places, they were seen lying dead, heaped upon each other to the depth of four feet; in others, they covered the surface like a black cloth; the trees bent with their weight, and the damage which the country sustained exceeded computation.

In Barbary, their numbers are formidable, and their visits frequent. Dr Shaw was a witness of their devastations in that country in 1724. Their first appearance was in the latter end of March, when the wind had been southerly for some time. In the beginning of April, their numbers were so vastly increased, that, in the heat of the day, they formed themselves into large swarms that appeared like clouds, and darkened the sun. In the middle of May they began to disappear, retiring into the plains to deposit their eggs. In June the young brood began to make their appearance, forming many compact bodies of several hundred yards square; which afterwards marching forward, climbed the trees, walls, and houses, eating every thing that was green in their way. The inhabitants, to stop their progress, laid trenches all over their fields and gardens, which they filled with water. Some placed large quantities of heath, stubble, and such like combustible matter, in rows, and set them on fire on the approach of the locusts. But all this was to no purpose; for the trenches were quickly filled up, and the fires put out by the great numbers of swarms that succeeded each other. A day or two after one of these was in motion, others that were just hatched came to glean after them, gnawing off the young branches, and the very bark of the trees. Having







ANCIENT LYRES.

Fig. 9.



Fig. 10.



Fig. 11.



Fig. 12.



Fig. 13.



Fig. 14.

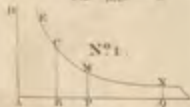
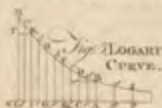
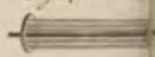


Fig. 8. LAPIDARY MILL or WHEEL.



Fig. 3. Loe.

Fig. 4. Loe Be.



**Locust** || **Log.**  
lived near a month in this manner, they arrived at their full growth, and threw off their worm-like state, by casting their skins. To prepare themselves for this change, they fixed their hinder part to some bush or twig, or corner of a stone, when immediately, by an undulating motion used on this occasion, their heads would first appear, and soon after the rest of their bodies. The whole transformation was performed in seven or eight minutes time, after which they remained for a little while in a languishing condition; but as soon as the sun and air had hardened their wings, and dried up the moisture that remained after casting off their former sloughs, they returned to their former greenness, with an addition both of strength and agility. But they did not long continue in this state before they were entirely dispersed. After laying their eggs, they directed their course northward, and probably perished in the sea.

It would be endless to recount all the mischiefs which these locusts have at different times occasioned; but what induces them to take such distant flights as they are known to do, seems not easily discovered. Most probably, by reason of very dry seasons is the internal parts of Africa, they are propagated in such numbers, that the vegetables of the spot where they are produced are not sufficient for their maintenance. Thus being obliged to find out other countries, they traverse the sandy deserts; and still meeting with nothing to allure them from their flight, they proceed forward across the sea, and thus come into Europe, where they alight upon the first green pastures that occur.

**See Acri-**  
**phagi.**  
In some parts of the world, locusts are used as food\*. In many oriental countries they are caught in small nets provided for that purpose. They parch them over the fire in an earthen pan; and when their wings and legs are fallen off, they turn reddish, of the colour of boiled shrimp. Dampier has eat them thus prepared, and thinks them a tolerable dish. The natives of Barbary also eat them fried with salt; and they are said to taste like cray-fish.

**LOCUST-EATERS.** See the last article, and **ACRIDOPHAGI**.

**AMERICAN LOCUST.** See **CICADA**.

**LODGE-MENT**, in military affairs, a work made by the besiegers in some part of a fortification, (after the besieged have been driven out), to maintain it, and be covered from the enemy's fire.—When a lodgement is to be made on the glacis, covert-way, or in a breach, there must be a great provision made of fascines, sand bags, gabions, wool-packs, &c. in the trenches; and during the action, the pioneers, under the direction of an engineer, with fascines, sand-bags, &c. should be making the lodgement, in order to form a covering, while the grenadiers are storming the covert way.

**LOG**, a machine used to measure the ship's headway, or the rate of her velocity as she advances through the sea. It is composed of a reel and line, to which is fixed a small piece of wood, forming the quadrant of a circle. The term *log* however is more particularly applied to the latter. See **NAVIGATION**.

It is usual to heave the log once every hour in ships of war and East-Indiamen; and in all other vessels, once in two hours; and if at any time of the watch,

the wind has increased or abated in the intervals, so as to affect the ship's velocity, the officer generally makes a suitable allowance for it, at the close of the watch.

**Log-Board**, a sort of table, divided into several columns, containing the hours of the day and night, the direction of the winds, the course of the ship, and all the material occurrences that happen during the 24 hours, or from noon to noon; together with the latitude by observation. From this table the different officers of the ship are furnished with materials to compile their journals, wherein they likewise insert whatever may have been omitted, or reject what may appear superfluous in the log-board.

**Log-Book**, a book into which the contents of the log-board is daily copied at noon, together with every circumstance deserving notice, that may happen to the ship, or within her cognizance, either at sea or in a harbour, &c. The intermediate divisions or watches of the log-book, containing four hours each, are usually signed by the commanding officer thereof, in ships of war or East-Indiamen. See **NAVIGATION**.

**LOGWOOD.** See **HÆMATOXYLON**.

**LOGARITHMIC CURVE.** If on the line **AN** both ways indefinitely extended, be taken **AC**, **CE**, **EG**, **GI**, **IL**, on the right hand; and also **Ag**, **gP**, <sup>Plate CLXI.</sup> **gS**, <sup>fig. 5.</sup> &c. on the left, all equal to one another: and if at the points **Pg**, **A**, **C**, **E**, **G**, **I**, **L**, be erected to the right line **AN**, the perpendiculars **PS**, **gd**, **AB**, **CD**, **EF**, **GH**, **IK**, **LM**, which let be continually proportional, and represent numbers, viz. **AB**, 1; **CD**, 10; **EF**, 100, &c. then shall we have two progressions of lines, arithmetical and geometrical: for the lines **AC**, **AE**, **AG**, &c. are in arithmetical progression, or as 1, 2, 3, 4, 5, &c. and so represent the logarithms to which the geometrical lines **AB**, **CD**, **EF**, &c. do correspond. For since **AG** is triple of the first line **AC**, the number **GH** shall be in the third place from unity, if **CD** be in the first: so likewise shall **LM** be in the fifth place, since **AL**=5 **AC**. If the extremities of the proportionals **S**, **d**, **B**, **D**, **F**, &c. be joined by right lines, the figures **SBML** will become a polygon, consisting of more or less sides, according as there are more or less terms in the progression.

If the parts **AC**, **CE**, **EG**, &c. be bisected in the points, **c**, **e**, **g**, **i**, **l**, and there be again raised the perpendiculars **cd**, **ef**, **gh**, **ik**, **lm**, which are mean proportionals between **AB**, **CD**; **CD**, **EF**, &c. then there will arise a new series of proportionals, whose terms, beginning from that which immediately follows unity, are double of those in the first series, and the difference of the terms is become less, and approach nearer to a ratio of equality, than before. Likewise, in this new series, the right lines **AL**, **Ac**, express the distances of the terms **LM**, **cd**, from unity, viz. since **AL** is ten times greater than **Ac**, **LM** shall be the tenth term of the series from unity: and because **Ac** is three times greater than **Ac**, **ef** will be the third term of the series if **cd** be the first, and there shall be two mean proportionals between **AB** and **ef**; and between **AB** and **LM** there will be nine mean proportionals. And if the extremities of the lines **Bd**, **Df**, **Fh**, &c. be joined by right lines, there will be a new polygon made, consisting of more but shorter sides than the last.

If in this manner, mean proportionals be continual-

Logarithmically placed between every two terms, the number of terms at last will be made so great, as also the number of the sides of the polygon, as to be greater than any given number, or to be infinite; and every side of the polygon so lessened, as to become less than any given right line; and consequently the polygon will be changed into a curve-lined figure; for any curve-lined figure may be conceived as a polygon, whose sides are infinitely small and infinite in number. A curve described after this manner is called *logarithmical*.

It is manifest from this description of the logarithmic curve, that all numbers at equal distances are continually proportional. It is also plain, that if there be four numbers, AB, CD, IK, LM, such that the distance between the first and second be equal to the distance between the third and the fourth, let the distance from the second to the third be what it will, these numbers will be proportional. For because the distances AC, IL, are equal, AB shall be to the increment D<sub>r</sub>, as IK is to the increment MT. Wherefore, by composition, AB : DC :: IK : ML. And, contrariwise, if four numbers be proportional, the distance between the first and second shall be equal to the distance between the third and fourth.

The distance between any two numbers, is called the *logarithm of the ratio of those numbers*: and, indeed, doth not measure the ratio itself, but the number of terms in a given series of geometrical proportionals, proceeding from one number to another, and defines the number of equal ratios by the composition whereof the ratio of numbers is known.

LOGARITHMS, are the indexes or exponents (mostly whole numbers and decimal fractions, consisting of seven places of figures at least) of the powers or roots (chiefly broken) of a given number; yet such indexes or exponents, that the several powers or roots they express are the natural numbers 1, 2, 3, 4, 5, &c. to 10 or 100000, &c. (as, if the given number be 10, and its index be assumed 1.0000000, then the 0.0000000 root of 10, which is 1, will be the logarithm of 1; the 0.301036 root of 10, which is 2, will be the logarithm of 2; the 0.477121 root of 10, which is 3, will be the logarithm of 3; the 1.612060 root of 10, the logarithm of 4; the 1.041393 power of 10, the logarithm of 11; the 1.079181 power of 10 the logarithm of 12, &c.) being chiefly contrived for ease and expedition in performing of arithmetical operations in large numbers, and in trigonometrical calculations; but they have likewise been found of extensive service in the higher geometry, particularly in the method of fluxions. They are generally founded on this consideration, that if there be any row of geometrical proportional numbers, as 1, 2, 4, 8, 16, 32, 64, 128, 256, &c. or 1, 10, 100, 1000, 10000, &c. and as many arithmetical progressional numbers adapted to them, or set over them, beginning with 0,

thus,  $\begin{Bmatrix} 0, & 1, & 2, & 3, & 4, & 5, & 6, & 7, & \&c. \\ 1, & 2, & 4, & 8, & 16, & 32, & 64, & 128, & \&c. \end{Bmatrix}$   
or,  $\begin{Bmatrix} 0, & 1, & 2, & 3, & 4, & \&c. \\ 1, & 10, & 100, & 1000, & 10000, & \&c. \end{Bmatrix}$

then will the sum of any two of these arithmetical progressionals, added together, be that arithmetical progression which answers to or stands over the geometrical progression, which is the product of the two geometrical progressionals over which the two assumed

arithmetical progressionals stand: again, if those arithmetical progressionals be subtracted from each other, the remainder will be the arithmetical progression standing over that geometrical progression which is the quotient of the division of the two geometrical progressionals belonging to the two first assumed arithmetical progressionals; and the double, triple, &c. of any one of the arithmetical progressionals, will be the arithmetical progression standing over the square, cube, &c. of that geometrical progression which the assumed arithmetical progression stands over, as well as the  $\frac{1}{2}$ ,  $\frac{1}{3}$ , &c. of that arithmetical progression will be the geometrical progression answering to the square root, cube root, &c. of the arithmetical progression over it; and from hence arises the following common, tho' lame and imperfect definition of logarithms, viz. "That they are so many arithmetical progressionals, answering to the same number of geometrical ones." Whereas, if any one looks into the tables of logarithms, he will find, that these do not all run on in an arithmetical progression, nor the numbers they answer to in a geometrical one; these last being themselves arithmetical progressionals. Dr Wallis, in his History of Algebra, calls logarithms the indexes of the ratios of numbers to one another. Dr Halley, in the Philosophical Transactions, n<sup>o</sup> 216, says, they are the exponents of the ratios of unity to numbers. So also Mr Cotes, in his *Harmonia Mensurarum*, says, they are the numerical measures of ratios. But all these definitions convey but a very confused notion of logarithms. Mr Maclaurin, in his Treatise of Fluxions, has explained the nature and genesis of logarithms agreeably to the notion of their first inventor Lord Napier. Logarithms then, and the quantities to which they correspond, may be supposed to be generated by the motion of a point; and if this point moves over equal spaces in equal times, the line described by it increases equally.

Again a line decreases proportionably, when the point that moves over it describes such parts in equal times as are always in the same constant ratio to the lines from which they are subtracted, or to the distances of that point, at the beginning of those lines, from a given term in that line. In like manner, a line may increase proportionably, if in equal times the moving point describes spaces proportional to its distances from a certain term at the beginning of each time. Thus, in Plate the first case, let  $ac$  be to  $ao$ ,  $cd$  to  $co$ ,  $de$  to  $do$ ,  $ef$  to  $eo$ ,  $fg$  to  $fo$ , always in the same ratio of QR to QS; GLXII. fig. 3. n<sup>o</sup> 1, 2. and suppose the point P sets out from  $a$ , describing  $ac$ ,  $cd$ ,  $de$ ,  $ef$ ,  $fg$ , in equal parts of the time; and let the space described by P in any given time be always in the same ratio to the distance of P from  $ao$  at the beginning of that time; then will the right line  $ao$  decrease proportionably.

In like manner, the line  $oa$ , (*ibid.* n<sup>o</sup> 3.) increases proportionably, if the point  $p$ , in equal times, describes the spaces  $ac$ ,  $cd$ ,  $de$ ,  $ef$ , &c. so that  $ac$  is to  $ao$ ,  $cd$  to  $co$ ,  $de$  to  $do$ , &c. in a constant ratio. If we now suppose a point P describing the line AC (*ibid.* n<sup>o</sup> 4.) with an uniform motion, while the point  $p$  describes a line increasing or decreasing proportionally, the line AP, described by P, with this uniform motion, in the same time that  $oa$ , by increasing or decreasing proportionally, becomes equal to  $op$ , is the logarithm of  $op$ . Thus AC, AD, AE, &c. are the logarithms of





Logarithms logarithm of 9 double the logarithm of 3. So, also having found the logarithms of 13, 17, and 19, and also of 23 and 29, they did easily get those of all the numbers between 10 and 30, by addition and subtraction only; and so having found the logarithms of other prime numbers, they got those of other numbers compounded of them.

But since the way above hinted at, for finding the logarithms of the prime numbers, is so intolerably laborious and troublesome, the more skilful mathematicians that came after the first inventors, employing their thoughts about abbreviating this method, had a vastly more easy and short way offered to them: from the contemplation and mensuration of hyperbolic spaces contained between the portions of an asymptote, right lines perpendicular to it, and the curve of the hyperbola: for if ECN (Plate CLXI. fig. 6. n<sup>o</sup> 1.) be an hyperbola, and AD, AQ, the asymptotes, and AB, AP, AQ, &c. taken upon one of them, be represented by numbers, and the ordinates BC, PM, QN, &c. be drawn from the several points B, P, Q, &c. to the curve, then will the quadrilinear spaces BCMP, PMNQ, &c. viz. their numerical measures, be the logarithms of the quotients of the division of AB by AP, AP by AQ, &c. since, when AB, AP, AQ, &c. are drawn in equal proportions, the said spaces are equal, as is demonstrated by several writers concerning conic sections.

Having said that these hyperbolic spaces, numerically expressed, may be taken for logarithms, we shall next give a specimen, from the great Sir Isaac Newton, of the method how to measure these spaces, and consequently of the construction of the logarithms.

Let CA (*ibid.* n<sup>o</sup> 2.) = AF be = 1, and AB = Ab = x; then will  $\frac{1}{1+x}$  be = BD, and  $\frac{1}{1-x}$  = bd; and putting

these expressions into serieses, it will be  $\frac{1}{1+x} = 1 - x + x^2$

$-x^3 + x^4 - x^5$ , &c. and  $\frac{1}{1-x} = 1 + x + x^2 + x^3 + x^4 + x^5$ , &c.

and  $\frac{x}{1+x} = x - x^2 + x^3 - x^4 + x^5 - x^6$ , &c. and  $\frac{x}{1-x} = x + x^2 + x^3 + x^4 + x^5 + x^6$ , &c. and taking the fluents, we shall have the area AFDB =  $\frac{xx}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \frac{x^5}{5}$ , &c. and the area AFdb =  $\frac{xx}{2} + \frac{x^3}{3} + \frac{x^4}{4} + \frac{x^5}{5}$ , &c.

&c. and the sum bd DB =  $2x + \frac{2x^3}{3} + \frac{2x^5}{5} + \frac{2x^7}{7} + \frac{2x^9}{9}$ , &c.

Now, if AB or ab be  $\frac{1}{10}$  = x, CB being = 0.9, and CB = 1.1, by putting this value of x in the equations above, we shall have the area bd DB = 0.2006706954621511, for the terms of the series will stand as you see in this table.

|                    |           |                       |
|--------------------|-----------|-----------------------|
| 0.2000000000000000 | = first   | } Term of the series. |
| 6666666666666666   | = second  |                       |
| 4000000000000000   | = third   |                       |
| 285714.86          | = fourth  |                       |
| 2222222            | = fifth   |                       |
| 18182              | = sixth   |                       |
| 154                | = seventh |                       |
| 1                  | = eighth  |                       |

0.2006706954621511

If the parts Ad and AD of this area be added separately. Logarithms ly, and the lesser DA be taken from the greater dA, we shall have  $Ad - AD = x^2 + \frac{x^4}{2} + \frac{x^6}{3} + \frac{x^8}{4} = 0.0100503358535014$ , for the terms reduced to decimals will stand thus:

|                    |           |                       |
|--------------------|-----------|-----------------------|
| 0.0100000000000000 | = first   | } Term of the series. |
| 5000000000000000   | = second  |                       |
| 3333333333         | = third   |                       |
| 2500000000         | = fourth  |                       |
| 2000000            | = fifth   |                       |
| 1667               | = sixth   |                       |
| 14                 | = seventh |                       |

0.0100503358535014

Now if this difference of the areas be added to, or subtracted from their sum before found, half the aggregate, viz. 0.1053605156578263 will be the greater area Ad, and half the remainder, viz. 0.0953101798043249, will be the lesser area AD.

By the same tables, these areas AD and Ad, will be obtained also when AB = Ab are supposed to be  $\frac{1}{100}$  or CB = 1.01, and CB = 0.99, if the numbers are but duly transferred to lower places, as

|                    |          |                       |
|--------------------|----------|-----------------------|
| 0.0200000000000000 | = first  | } term of the series. |
| 6666666666         | = second |                       |
| 400000             | = third  |                       |
| 28                 | = fourth |                       |

Sum = 0.0200066670666694 = area bB.

|                    |          |                       |
|--------------------|----------|-----------------------|
| 0.0001000000000000 | = first  | } term of the series. |
| 50000000           | = second |                       |
| 3333               | = third  |                       |

0.000100050003333 = area Ad · AD.

Half the aggregate 0.0100503358535014 = Ad, and half the remainder, viz. 0.0099503308531681 = AD.

And so putting AB = Ab =  $\frac{1}{1000}$  or CB = 1.001 and CB = 0.999, we obtain Ad = 0.00100050003335835, and AD = 0.00099950013330835.

After the same manner, if AB = Ab, be = 0.2, or 0.02, or 0.002, these areas will arise.

Ad = 0.2231435513142097, and AD = 0.182321557693546, or Ad = 0.0202027073175194, and AD = 0.1098026272961797, or Ad = 0.002002, and AD = 0.001.

From these areas thus found, others may be easily had from addition and subtraction only. For since  $\frac{1.2}{0.8} \times \frac{1.2}{0.9}$

= 2, the sum of the areas belonging to the ratios  $\frac{1.2}{0.8}$  and  $\frac{1.2}{0.9}$  (that is, insisting upon the parts of the absciss 1.2, 0.8; and 1.2, 0.9) viz.

AD = 0.18232, &c. A d = 0.10536, &c.

Sum = 0.28768, &c.

added thus, } 0.40546, &c. 0.28768, &c.

Total = 0.69314, &c. = the area of AFHG,

when CG is = 2. Also, since  $\frac{1.2}{0.8} \times 2 = 3$ , the sum

1.0986122,

1.0986122, &c. of the areas belonging to  $\frac{1.2}{0.8}$ , and 2, will be the area of AFGH, when CG=3. Again, since  $\frac{2 \times 2}{0.8} = 5$ , and  $2 \times 5 = 10$ ; by adding  $Ad = 0.2231$ , &c.  $AD = 0.1823$ , &c. and  $Ad = 0.1053$ , &c. together, their sum is 0.5108, &c. and this added to 1.0986, &c. the area of AFGH, when CG=3. You will have 1.609379124341004=AFGH, when CG is 5; and adding that of 2 to this, gives 2.3025850929940457=AFGH, when CG is equal to 10: and since  $10 \times 10 = 100$ , and  $10 \times 100 = 1000$ , and  $\sqrt{5 \times 10 \times 0.98} = 7$ , and  $10 \times 1.1 = 11$ , and  $\frac{1000 \times 1.091}{7 \times 11} = 13$ , and  $\frac{1000 \times 0.998}{2} =$

499, it is plain that the area AFGH may be found by the composition of the areas found before, when CG=100, 1000, or any other of the numbers above mentioned; and all these areas are the hyperbolic logarithms of those several numbers.

Having thus obtained the hyperbolic logarithms of the numbers 10, 0.98, 0.99, 1.01, 1.02; if the logarithms of the four last of them be divided by the hyperbolic logarithm 2.3025850, &c. of 10, and the index 2, be added; or, which is the same thing, if it be multiplied by its reciprocal 0.434294481903 518, the value of the subtangent of the logarithmic curve, to which Briggs's logarithms are adapted, we shall have the true tabular logarithms of 98, 99, 100, 101, 102. There are to be interpolated by ten intervals, and then we shall have the logarithms of all the numbers between 980 and 1020; and all between 980 and 1000, being again interpolated by ten intervals, the table will be as it were constructed. Then from these we are to get the logarithms of all the prime numbers, and their multiples less than 100, which may be done by

addition and subtraction only; for  $\frac{\sqrt{84 \times 1020}}{9945} = 2$ ;  
 $\frac{\sqrt{8 \times 9963}}{984} = 3$ ;  $\frac{10}{2} = 5$ ;  $\frac{\sqrt{98}}{2} = 7$ ;  $\frac{99}{9} = 11$ ;  $\frac{1001}{7 \times 11} = 13$ ;  
 $\frac{102}{6} = 17$ ;  $\frac{988}{4 \times 13} = 19$ ;  $\frac{9936}{16 \times 27} = 23$ ;  $\frac{986}{2 \times 17} = 29$ ;  $\frac{992}{32} = 31$ ;  
 $\frac{999}{27} = 37$ ;  $\frac{984}{24} = 41$ ;  $\frac{989}{23} = 43$ ;  $\frac{987}{21} = 47$ ;  
 $\frac{9911}{11 \times 17} = 53$ ;  $\frac{9971}{13 \times 13} = 59$ ;  $\frac{9882}{2 \times 81} = 61$ ;  $\frac{9949}{3 \times 49} = 67$ ;  
 $\frac{994}{14} = 71$ ;  $\frac{9928}{8 \times 17} = 73$ ;  $\frac{9954}{7 \times 18} = 79$ ;  $\frac{996}{12} = 83$ ;  $\frac{9968}{7 \times 16} = 89$ ;  
 $\frac{9894}{6 \times 17} = 97$ ; and thus having the logarithms of all the numbers less than 100, you have nothing to do but interpolate the several terms, through ten intervals.

Now the void places may be filled up by the following theorem. Let  $n$  be a number, whose logarithm is wanted; let  $x$  be the difference between that and the two nearest numbers, equally distant on each side, whose logarithms are already found; and let  $d$  be half the difference of their logarithms: then the required logarithm of the number  $n$ , will be had by adding  $d + \frac{dx}{2n} + \frac{dx^3}{12n^3}$ , &c. to the logarithm of the lesser number; for if the numbers are represented by  $Cp$ , CG, CP, (*ibid.* n° 2.) and the ordinates  $p_1$ , PQ, be raised; if  $n$  be wrote for

CG, and  $x$  for GP, or  $Cp$ , the area  $p_1QP$ , or  $\frac{2x}{n} + \frac{x^2}{2n^2}$ , &c. will be to the area  $p_1HG$ , as the difference between the logarithms of the extreme numbers, or 2  $d$ , is to the difference between the logarithms of the lesser, and of the middle one; which, therefore, will be  $\frac{dx}{n} + \frac{dx^2}{2n^2} + \frac{dx^3}{3n^3}$ , &c.  $= d + \frac{dx}{2n} + \frac{dx^3}{12n^3}$ , &c.

The two first terms  $d + \frac{dx}{2n}$  of this series, being sufficient for the construction of a canon of logarithms, even to 14 places of figures, provided the number, whose logarithm is to be found, be less than 1000; which cannot be very troublesome, because  $x$  is either 1 or 2: yet it is not necessary to interpolate all the places by help of this rule, since the logarithms of numbers, which are produced by the multiplication or division of the number last found, may be obtained by the numbers whose logarithms were had before, by the addition or subtraction of their logarithms. Moreover, by the difference of their logarithms, and by their second and third differences, if necessary, the void places may be supplied more expeditiously; the rule foregoing being to be applied only where the continuation of some full places is wanted, in order to obtain these differences.

By the same method rules may be found for the intercalation of logarithms, when of three numbers the logarithm of the lesser and of the middle number are given, or of the middle number and the greater; and this although the numbers should not be in arithmetical progression. Also by pursuing the steps of this method, rules may be easily discovered for the construction of artificial lines and tangents, without the help of the natural tables. Thus far the great Newton, who says, in one of his letters to Mr Leibnitz, that he was so much delighted with the construction of logarithms, at his first setting out in those studies, that he was ashamed to tell to how many places of figures he had carried them at that time: and this was before the year 1666; because, he says, the plague made him lay aside those studies, and think of other things.

Dr Keil, in his Treatise of Logarithms, at the end of his Commandine's Euclid, gives a series, by means of which may be found easily and expeditiously the logarithms of large numbers. Thus, let  $z$  be an odd number, whose logarithm is sought: then shall the numbers  $z-1$  and  $z+1$  be even, and accordingly their logarithms, and the difference of the logarithms will be had, which let be called  $y$ . Therefore, also the logarithm of a number, which is a geometrical mean between  $z-1$  and  $z+1$ , will be given, viz. equal to half the sum of the logarithms.

Now the series  $y \times \frac{1}{4z} - \frac{1}{24z^3} + \frac{181}{15120z^5} - \frac{13}{25200z^7}$ , &c. shall be equal to the logarithm of the ratio, which the geometrical mean between the numbers  $z-1$  and  $z+1$ , has to the arithmetical mean, viz. to the number  $z$ . If the number exceeds 1000, the first term of the series, viz.  $\frac{y}{4z}$ , is sufficient for producing the



*Logarithms* logarithm to 13 or 14 places of figures, and the second term will give the logarithm to 20 places of figures. But if  $z$  be greater than 10000, the first term will exhibit the logarithm to 18 places of figures; and so this series is of great use in filling up the chills omitted by Mr Briggs. For example, it is required to find the logarithm of 20001; the logarithm

0.00000000542813; and if the logarithm of the geometrical mean, viz.  
4.301051709302416 be added to the

4.301051709845230=the logarithm of 20001.

Wherefore it is manifest, that to have the logarithm to 14 places of figures, there is no necessity of continuing out the quotient beyond 6 places of figures. But if you have a mind to have the logarithm to 10 places of figures only, the two first figures are enough. And if the logarithms of the numbers above 20000 are to be found by this way, the labour of doing them will mostly consist in setting down the numbers. This series is easily deduced from the consideration of the hyperbolic spaces aforesaid. The first figure of every logarithm towards the left hand, which is separated from the rest by a point, is called the *index of that logarithm*; because it points out the highest or remotest place of that number from the place of unity in the infinite scale of proportionals towards the left hand: thus, if the index of the logarithm be 1, it shews that its highest place towards the left hand is the tenth place from unity; and therefore all logarithms which have 1 for their index, will be found between the tenth and hundredth place, in the order of numbers. And for the same reason all logarithms which have 2 for their index, will be found between the hundredth and thousandth place, in the order of numbers, &c. Whence universally the index or characteristic of any logarithm is always less by one than the number of figures in whole numbers, which answer to the given logarithm; and, in decimals, the index is negative.

As all systems of logarithms whatever, are composed of similar quantities, it will be easy to form, from any system of logarithms, another system in any given ratio; and consequently to reduce one table of logarithms into another of any given form. For as any one logarithm in the given form, is to its correspondent logarithm in another form; so is any other logarithm in the given form, to its correspondent logarithm in the required form; and hence we may reduce the logarithms of lord Napier into the form of Briggs's, and contrariwise. For as 2.302585092, &c. lord Napier's logarithm of 10, is to 1.0000000000 Mr Briggs's logarithm of 10; so is any other logarithm in lord Napier's form, to the correspondent tabular logarithm in Mr Briggs's form: And because the two first numbers constantly remain the same; if lord Napier's logarithm of any one number be divided by 2.302585, &c. or multiplied by 4342944, &c. the ratio of 1.00000, &c. to 2.30258, &c. as is found by dividing 1.00000, &c. by 2.30258, &c. the quotient in the former, and the product in the latter, will give the correspondent logarithm in Briggs's form, and the contrary. And, after the same manner, the ratio of natural logarithms to that of Briggs's will be found=86858896306.

#### The Use and Application of LOGARITHMS.

It is evident, from what has been said of the con-

struction of logarithms, that addition of logarithms must be the same thing as multiplication in common arithmetick; and subtraction in logarithms the same as division: therefore, in multiplication by logarithms, add the logarithms of the multiplicand and multiplier together, their sum is the logarithm of the product.

|          |              |     |           |
|----------|--------------|-----|-----------|
| Example. | Multiplicand | 8.5 | 0.1294189 |
|          | Multiplier   | 10  | 1.0000000 |
|          | Product      | 85  | 1.9294189 |

And in division, subtract the logarithm of the divisor from the logarithm of the dividend, the remainder is the logarithm of the quotient.

|          |          |        |           |
|----------|----------|--------|-----------|
| Example. | Dividend | 9712.8 | 3.9873444 |
|          | Divisor  | 456    | 2.6589648 |
|          | Quotient | 21.3   | 1.3283796 |

#### To find the Complement of a LOGARITHM.

Begin at the left hand, and write down what each figure wants of 9, only what the last significant figure wants of 10; so the complement of the logarithm of 456, viz. 2.6589648, is 7.3410352.

In the rule of three. Add the logarithms of the second and third terms together, and from the sum subtract the logarithm of the first, the remainder is the logarithm of the fourth. Or, instead of subtracting a logarithm, add its complement, and the result will be the same.

#### To raise Powers by LOGARITHMS.

Multiply the logarithm of the number given, by the index of the power required; the product will be the logarithm of the power sought.

Example. Let the cube of 32 be required by logarithms. The logarithm of 32=1.5051500, which multiplied by 3, is 4.5154500, the logarithm of 32768, the cube of 32. But in raising powers, viz. squaring, cubing, &c. of any decimal fraction by logarithms, it must be observed, that the first significant figure of the power be put so many places below the place of units, as the index of its logarithm wants of 10, 100, &c. multiplied by the index of the power.

#### To extract the Roots of Powers by LOGARITHMS.

Divide the logarithm of the number by the index of the power, the quotient is the logarithm of the root sought.

#### To find mean Proportionals between any two numbers.

Subtract the logarithm of the least term from the logarithm of the greatest, and divide the remainder by a number more by one than the number of means de-

Logarithms defined; then add the quotient to the logarithm of the least term (or subtract it from the logarithm of the greatest) continually, and it will give the logarithms

of all the mean proportionals required.

Example. Let three mean proportionals be sought, between 106 and 100.

$$\text{Logarithm of } 106 = 2.0253058$$

$$\text{Logarithm of } 100 = 2.0000000$$

$$\text{Divided by } 4) 0.0253059 \text{ (} 0.0063264.75$$

Logarithm of the least term 100 added

2.0000000

Logarithm of the first mean 101.4673846

2.0063264.75

Logarithm of the second mean 102.9563014

2.0126529.5

Logarithm of the third mean 104.4670483

2.0189794.25

Logarithm of the greatest term 106

2.0253059.

The following method, communicated by Mr Thomas Atkinson, Esq. of Ballyshannon, Ireland, is much more expeditious and easy.

In any series of numbers in a geometrical progression, beginning from unity, as in the margin, the series is composed of a set of continued proportionals, of which the member standing nearest to unity is the common ratio or rate of the proportion. If over or under these another series is placed, as in the example, of numbers in an arithmetical progression, beginning with naught, and whose common difference is unity, the members of this series are called *indexes*; for they serve to show how many successive multiplications have been made with the common rate to produce that member of the geometrical progression over which each of these indexes does severally stand.

This theory may be considered in another light. If the square root of 10 (that is, of the common rate) is found, it is a mean proportional between 1 and 10, and becomes a new common rate for a new set of continued proportionals, as in the margin. And if the half of unity, which in the former case was the additional difference of the arithmetical progression, is made the additional difference of this new series, and noted as in the example, a new combination is formed of two series agreeing with the first in these remarkable properties, viz. If any two members of the geometrical progression are multiplied together, the sum of their corresponding indexes will become the index of their product; and conversely, if any one of them is divided by any other, the difference of their indexes will be found to be the index of the quotient. This theory is indefinite; and repeated extractions may be made with any proposed number of decimals, and bisection made of the corresponding indexes, until one has no more number to work with; and each of the mean proportionals thus found between 1 and 10, will be found a member of every new geometrical progression formed by every smaller root; and consequently all the roots thus found, together with their corresponding indexes, have,

in cases of multiplication or division, the same connection, as has been just described.

Let those successive roots be found, and noted in the form of a table, and, in another column, let the corresponding indexes found by these directions be regularly noted, each opposite to its own roots. These indexes are commonly known by the denomination of *logarithms*; the roots themselves may be called *natural numbers*.

These roots are composed of natural numbers seldom or never wanted; but from them the logarithms of such as are of general use may be thus found.

Suppose 2 the proposed number, one must examine the table of roots; there he will find 3.16, &c. &c. the nearest to 2 of those which are greater; and 1.778, &c. &c. also nearest to it of those which are less. He may make a division at his pleasure, either  $\frac{3.16}{2}$  or

$\frac{2}{1.77}$ ; yet let the choice fall on what will yield the

smallest quotient, and let the  $\frac{2}{1.77} = 1.1246$ , &c. &c. circumstances of the calculation be noted, as in the margin, for future direction. Here  $\frac{1.154}{1.124} = 1.02$ , &c. &c.

$\frac{2}{1.77} = 1.1246$ . With this quotient let the table be applied to as before, and 1.1246, &c. will be found to be between 1.154, &c. &c. and 1.074, &c. &c. and division to be made as in the example. In this manner one is to proceed with each successive quotient, till at length he has one in which the number of the initial decimal noughts is equal at least, if not greater than that of the significant figures. Here the work of division may be discontinued; and as it will rarely happen, that one will not have an additional initial nought for every division, the number cannot be great in calculations of a moderate extent. Having at last found a quotient such as was described, and supposing the number of decimals to be 10, one may readily find the logm. of that quotient thus:—Suppose the quotient 1.000057968; he is to look into the table of roots for those noted with 5 initial decimal noughts, and from any one of these and its corresponding logm. state thus:

$$.0000087837, \dots 0000038147 \text{ its logm } \dots .0000057968 \text{ of the quotient.}$$

$$.0000025175, \text{ its logm.}$$

Thus knowing that 0.000025175, or such like, is the logm. of the last quotient, one may have that of 2, if he will but call to mind the following circumstances.

In every case of division, if he has logarithms of quotient and divisor, he has also that of the dividend, by adding the two first together: if he has the logarithm of the dividend, and that of either the divisor

or

By this method, the logarithm of any number within the compass of the table of roots may be found: if a greater is proposed, suppose 9495, it must be made 9.495, and its logarithm found; then it must be reduced to the proposed form, and have a proper index noted before the decimals just found. How to do this is too well known to have occasion to mention it here.

—3.301029995664 the logarithm of the fraction given.  
7 the power to which it is to be raised.

—19.107209969648 the logarithm of the answer.

This differs from the like work in whole numbers only in this, that, in multiplying the decimals, one has at last 2 to be carried from them to the whole numbers; this is to be considered as +2, then  $-3 \times 7 = -21$ , and  $-21 + 2 = -19$  to be noted the index of the answer. Extraction of the roots is only the converse of this. Suppose  $-19.107209969648$  given, to find that root whose exponent number is 7. As 7 is the exponent number here, one may in his mind multiply it by 2 for a trial, as in common division; but the product  $= 14$  being less than 19, must be rejected; then he may try it

Another **EXAMPLE.**  
Suppose  $-1.4771212545$  given, to extract the root of its 5th power.  
 $-1.8954252109$  the logarithm of the root.

For 5, the exponent of the root  $\times 1$  is greater than the index of the given logarithm, and 4 is the remainder. Then  $-1$  becomes the index of the logarithm

The reason for finding the logarithm of the last quotient by the common proportion is this: He who has made a table of roots, will find, by inspection only, that as initial noughts come into the decimal parts of the roots, the significant figures just immediately following them do assume the form of a geometrical progression, descending, whose common rate or divisor is 2, as is just the case with the whole of the decimals of the corresponding logarithms; and that the number of the significant figures endowed with this property is generally equal to that of the initial noughts: so far as this, and no farther, the common proportion will hold between the significant figures of the decimals in the roots and the same number of places in the logarithms; and for this reason it was needful to continue the successive divisions till a quotient was found so circumstanced, that its logarithm could be found by the proportion.

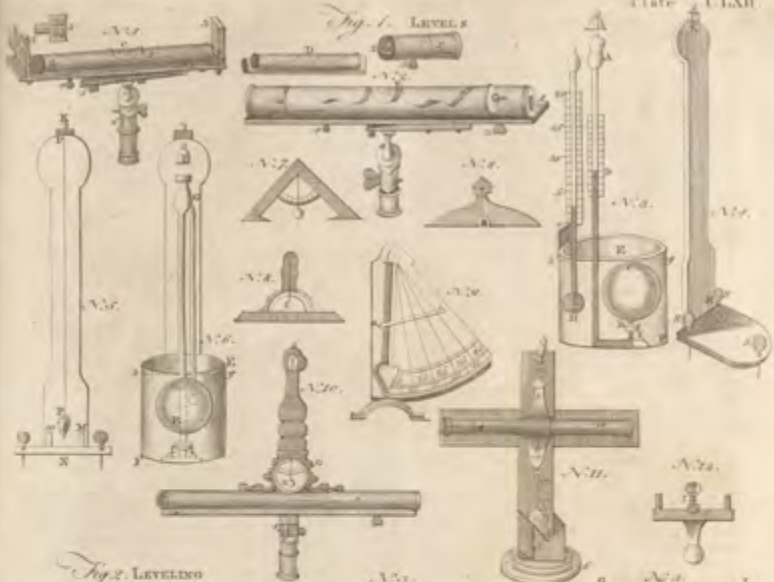
The same gentleman hath also favoured us with the following new method

*Of extracting Roots of Fractions by LOGARITHMS.*  
THE easiest way to explain this, is first to give an example of involving such numbers.

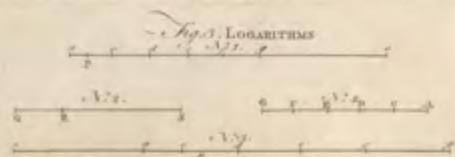
—19.107209969648 the logarithm of the answer.  
This 3 must be noted with a negative sign for the index of the new logarithm. Then, on comparing 19 with 21, the difference is 2. This 2 must be carried as 20 to the decimals, and one must from that carry on the division of the decimals with 7 for a divisor, as is usually done in other cases.

of the root; and  $4 =$  the overplus, is to be carried as 40 to the decimals; and from that, division is to be made with 5 as a divisor for the rest of the work.





*Fig. 3. LAPLYSIA.*



*Fig. 4. MANIS or Scaly Lizard*





## L O G I C,

THE art of thinking and reasoning justly; or, it may be defined the science or history of the human mind, inasmuch as it traces the progress of our knowledge from our first and most simple conceptions through all their different combinations, and all those numerous deductions that result from variously comparing them one with another.

The precise business of logic, therefore, is to explain the nature of the human mind, and the proper manner of conducting its several powers, in order to the attainment of truth and knowledge. It lays open those errors

and mistakes we are apt, through inattention, to run into; and teaches us how to distinguish between truth, and what only carries the appearance of it. By this means we grow acquainted with the nature and force of the understanding; see what things lie within its reach; where we may attain certainty and demonstration; and when we must be contented with probability.

This science is generally divided into four parts, viz. *Perception, Judgment, Reasoning, and Method*. This division comprehends the whole history of the sensations and operations of the human mind.

P A R T I.  
OF PERCEPTION.

WE find ourselves surrounded with a variety of objects, which acting differently upon our senses, convey distinct impressions into the mind, and thereby rouse the attention and notice of the understanding. By reflecting too on what passes within us, we become sensible of the operations of our own minds, and attend to them as a new set of impressions. But in all this there is only bare *consciousness*. The mind, without proceeding any farther, takes notice of the impressions that are made upon it, and views things in order, as they present themselves one after another. This attention of the understanding to the object acting upon it, whereby it becomes sensible of the impressions they make, is called by logicians *perception*; and the notices themselves, as they exist in the mind, and are there treasured up to be the materials of thinking and knowledge, are distinguished by the name of *ideas*. Having shewn at large, in the article *METAPHYSICS*, how the mind being furnished with ideas, contrives to diversify and enlarge its stock; we have here chiefly to consider the means of making known our thoughts to others; that we may not only understand how knowledge is acquired, but also in what manner it may be communicated with the greatest certainty and advantage.

## CHAP. I. Of Words, considered as the Signs of our Ideas.

Words furnish the means of recording our own thoughts.

OUR ideas, though manifold and various, are nevertheless all within our own breasts, invisible to others, nor can of themselves be made appear. But God, designing us for society, and to have fellowship with those of our kind, has provided us with organs fitted to frame articulate sounds, and given us also a capacity of using those sounds as signs of internal conceptions. Hence spring words and language; for, having once pitched upon any sound to stand as the mark of an idea in the mind, custom by degrees establishes such a connection between them, that the appearance of the idea in the understanding always brings to our remembrance the sound or name by which it is expressed; as in like manner the hearing of the sound never fails to excite the idea for which it is made

to stand. And thus it is easy to conceive how a man may record his own thoughts, and bring them again into view in any succeeding period of life. For this connection being once settled, as the same sounds will always serve to excite the same ideas; if he can but contrive to register his words in the order and disposition in which the present train of his thoughts present them to his imagination, it is evident he will be able to recal these thoughts at pleasure, and that too in the very manner of their first appearance. Accordingly we find, that the inventions of writing and printing, by enabling us to fix and perpetuate such perishable things as sounds, have also furnished us with the means of giving a kind of permanency to the transactions of the mind, inasmuch that they may be in the same manner subjected to our review, as any other abiding objects of nature.

II. But, besides the ability of recording our own thoughts, there is this farther advantage in the use of external signs, that they enable us to communicate our sentiments to each other, and also receive information of what passes in their breasts. For any number of men, having agreed to establish the same sounds as signs of the same ideas, it is apparent that the repetition of these sounds must excite the like perceptions in each, and create a perfect correspondence of thoughts. When, for instance, any train of ideas succeeded one another in my mind, if the names by which I am wont to express them have been annexed by those with whom I converse to the very same set of ideas, nothing is more evident, than that, by repeating those names according to the tenor of my present conceptions, I shall raise in their minds the same course of thought as has taken possession of my own. Hence, by barely attending to what passes within themselves, they will also become acquainted with the ideas in my understanding, and have them in a manner laid before their view. So that we here clearly perceive how a man may communicate his sentiments, knowledge and discoveries to others, if the language in which he converses be extensive enough to mark all the ideas and transactions of his mind. But as this is not always the case, and men are often obliged to in-

And of the mutual communication of knowledge from one man to another.



vent terms of their own, to express new views and conceptions of things; it may be asked, how in these circumstances we can become acquainted with the thoughts of another, when we make use of words, to which we have never annexed any ideas, and that of course can raise no perceptions in our minds. In order to unveil this mystery, and give some little insight into the foundation, growth, and improvement of language, the following observations will be found of considerable moment.

<sup>3</sup>  
Simple ideas cannot be conveyed into the mind by words, or a description.

III. First, That no word can be to any man the sign of an idea, till that idea comes to have a real existence in his mind. For names, being only so far intelligible as they denote known internal conceptions, where they have none such to answer them, there they are plainly sounds without signification, and of course convey no instruction or knowledge. But no sooner are the ideas to which they belong raised in the understanding, than, finding it easy to connect them with the established names, we can join in any agreement of this kind made by others, and thereby enjoy the benefit of their discoveries. The first thing therefore to be considered is, how these ideas may be conveyed into the mind; that being there, we may learn to connect them with their appropriated sounds, and so become capable of understanding others when they make use of these sounds in laying open and communicating their thoughts. Now, to comprehend this distinctly, it will be necessary to attend to the division of our ideas into simple and complex, (see METAPHYSICS). And first, as for our simple ideas; they can find no admission into the mind, but by the two original fountains of knowledge, sensation and reflection. If therefore any of these have as yet no being in the understanding, it is impossible by words or a description to excite them there. A man who had never felt the impression of *heat*, could not be brought to comprehend that sensation by any thing we might say to explain it. If we would really produce the idea in him, it must be by applying the proper object to his senses, and bringing him within the influence of a hot body. When this is done, and experience has taught him the perception to which men have annexed the name *heat*, it then becomes to him the sign of that idea, and he thenceforth understands the meaning of the term, which, before, all the words in this world would not have been sufficient to convey into his mind. The case is the same in respect of light and colours. A man born blind, and thereby deprived of the only conveyance for the ideas of this class, can never be brought to understand the names by which they are expressed. The reason is plain: they stand for ideas that have no existence in his mind; and as the organs appropriated to their reception is wanting, all other contrivances are vain, nor can they by any force of description be raised in his imagination. But it is quite otherwise in our complex notions. For these being no more than certain combinations of simple ideas, put together in various forms; if the original ideas out of which the collections are made have already got admission into the understanding, and the names serving to express them are known; it will be easy, by enumerating the several ideas concerned in the composition, and marking the order and manner in which

they are united, to raise any complex conception in the mind. Thus the idea answering to the word *rain-bow* may be readily excited in the imagination of another who has never seen the appearance itself, by barely describing the figure, largeness, position, and order of colours; if we suppose these several simple ideas, with their names, sufficiently known to him.

IV. And this leads to a second observation upon this subject, namely, That words standing for complex ideas are all definable, but those by which we denote simple ideas are not; for the perceptions of this latter class, having no other entrance into the mind than by sensation or reflection, can only be got by experience, from the several objects of nature, proper to produce those perceptions in us. Words indeed may very well serve to remind us of them, if they have already found admission into the understanding, and their connection with the established names is known; but they can never give them their original being and existence there. And hence it is, that when any one asks the meaning of a word denoting a simple idea, we pretend not to explain it to him by a definition, well knowing that to be impossible; but, supposing him already acquainted with the idea, and only ignorant of the name by which it is called, we either mention it to him by some other name, with which we presume he knows its connection, or appeal to the object where the idea itself is found. Thus was any one to ask the meaning of the word *white*, we should tell him it stood for the same idea as *albus* in Latin, or *blanc* in French; or, if we thought him a stranger to these languages, might appeal to an object producing the idea, by saying it denoted the colour we observe in *snow* or *milk*. But this is by no means a definition of the word, exciting a new idea in his understanding; but merely a contrivance to remind him of a known idea, and teach him its connection with the established name. For if the ideas after which he enquires have never yet been raised in his mind; as suppose one who had seen no other colours than *black* and *white*, should ask the meaning of the word *scarlet*; it is easy to perceive, that it would be no more possible to make him comprehend it by words, or a definition, than to discourse the same perception into the imagination of a man born blind. The only method in this case is, to present some object, by looking at which the perception itself may be excited, and thus he will learn both the name and the idea together.

V. But how comes it to pass that men agree in the names of their simple ideas, seeing they cannot view the perceptions in one another's minds, nor make known these perceptions by words to others? The effect is produced by experience and observation. Thus finding, for instance, that the name of *heat* is annexed to that impression which men feel when they approach the fire, I make it also the sign of the idea excited in me by such an approach, nor have any doubt but it denotes the same perception in my mind as in theirs. For we are naturally led to imagine, that the same objects operate alike upon the organs of the human body, and produce an uniformity of sensations. No man fancies, that the idea raised in him by the taste of *sugar*, and which he calls *sweetness*, differs from that excited in another by the like means; or that

<sup>4</sup>  
The names of complex ideas definable, those of simple ideas not.

<sup>5</sup>  
Experience and observation bring men to an agreement in the names of simple ideas.

that *wormwood*, to whose relish he has given the epithet *bitter*, produces in another the sensation which he denotes by the word *suave*. Presuming therefore upon this conformity of perceptions, when they arise from the same objects, we easily agree as to the names of our simple ideas; and if at any time, by a more narrow scrutiny into things, new ideas of this class come in our way, which we chuse to express by terms of our own invention; these names are explained, not by a definition, but by referring to the objects whence the ideas themselves may be obtained.

6  
The conveyance of complex ideas by definitions, a wife contrivance in nature.

VI. Being in this manner furnished with simple ideas, and the names by which they are expressed, the meaning of terms that stand for complex ideas is easily got; because the ideas themselves answering to these terms may be conveyed into the mind by definitions. For our complex notions are only certain combinations of simple ideas. When therefore these are enumerated, and the manner in which they are united into one conception, explained, nothing more is wanting to raise that conception in the understanding; and thus the term denoting it comes of course to be understood. And here it is worth while to reflect a little upon the wise contrivance of nature, in thus furnishing us with the very aptest means of communicating our thoughts. For were it not so ordered, that we could thus convey our complex ideas from one to another by definitions, it would in many cases be impossible to make them known at all. This is apparent in those ideas which are the proper work of the mind. For as they exist only in the understanding, and have no real objects in nature in conformity to which they are framed; if we could not make them known by description, they must lie for ever hid within our own breasts, and be confined to the narrow acquaintance of a single mind. All the fine scenes that arise from time to time in the poet's fancy, and by his lively painting give such entertainment to his readers; were he destitute of this faculty of laying them open to the view of others by words and description, could not extend their influence beyond their own imagination, or give joy to any but the original inventor.

7  
And of all great avail towards the improvement of knowledge.

VII. There is this farther advantage, in the ability we enjoy of communicating our complex notions by definitions; that as these make by far the largest class of our ideas, and most frequently occur in the progress and improvement of knowledge, so they are by these means imparted with the greatest readiness, than which nothing could tend more to the increase and spreading of science: for a definition is soon perused; and if the terms of it are well understood, the idea itself finds an easy admission into the mind. Whereas in simple perceptions, where we are referred to the objects producing them, if these cannot be come at, as is sometimes the case, the names by which they are expressed must remain empty sounds. But new ideas of this class occurring very rarely in the sciences, they seldom create any great obstruction. It is otherwise with our complex notions; for every step we take leading us into new combinations and views of things, it becomes necessary to explain these to others, before they can be made acquainted with our discoveries. and as the manner of definitions is easy, requiring no

apparatus but that of words, which are always ready, and at hand; hence we can with the less difficulty remove such obstacles as might arise from terms of our own invention, when they are made to stand for new, complex ideas suggested to the mind by some present train of thinking. And thus at last we are let into the mystery hinted at in the beginning of this chapter, viz. how we may become acquainted with the thoughts of another, when he makes use of words to which we have as yet joined no ideas. The answer is obvious from what has been already said. If the terms denote simple perceptions, he must refer us to these objects of nature whence the perceptions themselves are to be obtained; but, if they stand for complex ideas, their meaning may be explained by a definition.

## CHAP. II. Of Definitions.

I. A definition is the unfolding of some conception of the mind, answering to the word or term made use of as the sign of it. 8  
Definition

Now as, in exhibiting any idea to another, it is necessary that the description be such as may excite that precise idea in his mind; hence it is plain that definitions, properly speaking, are not arbitrary, but confined to the representing of certain determinate settled notions, such namely as are annexed by the speaker or writer to the words he uses. As nevertheless it is universally allowed that the signification of words is perfectly voluntary, and not the effect of any natural and necessary connection between them and the ideas for which they stand; some may perhaps wonder why definitions are not so too. In order therefore to unravel this difficulty, and shew distinctly what is and what is not arbitrary in speech, we must carefully distinguish between the connection of our words and ideas, and the unfolding of the ideas themselves.

II. First, as to the connection of our words and ideas; this, it is plain, is a purely arbitrary institution. When, for instance, we have in our minds the idea of any particular species of metals, the calling it by the name *gold* is an effect of the voluntary choice of men speaking the same language, and not of any peculiar aptness in that sound to express that idea. Other nations we find make use of different sounds, and with the same effect. Thus *aurum* denotes that idea in Latin, and *or* in French, and even the word *gold* itself would have as well served to express the idea of that metal which we call *silver*, had custom in the beginning established it. 9  
The connection between words and ideas, a perfectly voluntary establishment.

III. But although we are thus entirely at liberty in connecting any idea with any sound, yet it is quite otherwise in unfolding the ideas themselves. For every idea having a precise appearance of its own, by which it is distinguished from every other idea; it is manifest, that in laying it open to others, we must study such a description as shall exhibit that peculiar appearance. When we have formed to ourselves the idea of a figure bounded by four equal sides, joined together at right angles, we are at liberty to express that idea by any sound, and call it either a *square* or a *triangle*. But which ever of these names we use, so long as the idea is the same, the description by which we would signify it to another must be so too. Let it be called *square* or *triangle*, it is still a figure having 10  
The description of ideas not so, but bounded to the representation of that precise appearance by which they are distinguished among themselves.

four equal sides, and all its angles right ones. Hence we clearly see what is and what is not arbitrary in the use of words. The establishing any found as the mark of some determinate idea in the mind, is the effect of free choice, and a voluntary combination among men. And as different nations make use of different founds to denote the same ideas, hence proceeds all that variety of languages which we meet with in the world. But when a connection between our ideas and words is once settled, the unfolding of the idea answering to any word, which properly constitutes a definition, is by no means an arbitrary thing. For here we are bound to exhibit that precise conception which either the use of language, or our own particular choice, hath annexed to the term we use.

11  
Causes of the obscurity that has hitherto perplexed the theory of definitions.

IV. And thus it appears, that definitions, considered as descriptions of ideas in the mind, are steady and invariable, being bounded to the representation of these precise ideas. But then, in the application of definitions to particular names, we are altogether left to our own free choice. Because as the connecting of any idea with any found is a perfectly arbitrary institution; the applying the description of that idea to that found must be so too. When therefore logicians tell us that the definition of the name is arbitrary, they mean no more than this; that as different ideas may be connected with any term, according to the good pleasure of him that uses it, in like manner may different descriptions be applied to the term suitable to the ideas so connected. But this connection being settled, and the term considered as the sign of some fixed idea in the understanding, we are no longer left to arbitrary explications, but must study such a description as corresponds with that precise idea. Now this alone, according to what has been before laid down, ought to be accounted a definition. What seems to have occasioned no small confusion in this matter, is, that many explanations of words where no idea is unfolded, but merely the connection between some word and idea asserted, have yet been dignified with the name of definitions. Thus, when we say that *a clock is an instrument by which we measure time*; that is by some called a definition; and yet it is plain that we are beforehand supposed to have an idea of this instrument, and only taught that the word *clock* serves in common language to denote that idea. By this rule all explications of words in our dictionaries will be definitions, nay, the names of even simple ideas may be thus defined. *White*, we may say, is the colour we observe in snow or milk; *heat* the sensation produced by approaching the fire; and so in innumerable other instances. But these, and all others of the like kind, are by no means definitions, exciting new ideas in the understanding, but merely contrivances to remind us of known ideas, and teach their connection with the established names.

12  
Complex ideas alone capable of that kind of description which goes by the name of a definition.

V. But now in definitions properly so called, we first consider the term we use, as the sign of some inward conception, either annexed to it by custom, or our own free choice; and then the business of the definition is to unfold and explicate that idea. As therefore the whole art lies in giving just and true copies of our ideas; a definition is then said to be made perfect, when it serves distinctly to excite the idea de-

scribed in the mind of another, even supposing him before wholly unacquainted with it. This point settled, let us next inquire what those ideas are which are capable of being thus unfolded? And in the first place it is evident, that all our simple ideas are necessarily excluded. We have seen already that experience alone is to be consulted here, inasmuch that if either the objects whence they are derived come not in our way, or the avenues appointed by nature for their reception are wanting, no description is sufficient to convey them into the mind. But where the understanding is already supplied with these original and primitive conceptions, as they may be united together in an infinity of different forms; so may all their several combinations be distinctly laid open, by enumerating the simple ideas concerned in the various collections, and tracing the order and manner in which they are linked one to another. Now these combinations of simple notions constitute what we call our complex notions; whence it is evident that complex ideas, and those alone, admit of that kind of description which goes by the name of a definition.

VI. Definitions, then, are pictures or representations of our ideas; and as these representations are then only possible when the ideas themselves are complex, it is obvious to remark, that definitions cannot have place but where we make use of terms standing for such complex ideas. But our complex ideas, being as we have said nothing more than different combinations of simple ideas; we then know and comprehend them perfectly, when we know the several simple ideas of which they consist, and can so put them together in our minds as is necessary towards the framing of that peculiar connection which gives every idea its distinct and proper appearance.

VII. Two things are therefore required in every definition. First, that all the original ideas, out of which the complex one is formed, be distinctly enumerated. Secondly, that the order and manner of combining them into one conception be clearly explained. Where a definition has these requisites, nothing is wanting to its perfection; because every one who reads it and understands the terms, seeing at once what ideas he is to join together, and also in what manner, can at pleasure form in his own mind the complex conception answering to the term defined. Let us, for instance, suppose the word *square* to stand for that idea by which we represent to ourselves a figure whose sides subtend quadrants of a circumscribed circle. The parts of this idea are the sides bounding the figure. These must be four in number, and all equal among themselves, because they are each to subtend a fourth part of the same circle. But, besides these component parts, we must also take notice of the manner of putting them together, if we would exhibit the precise idea for which the word *square* here stands. For four equal right lines, any-how joined, will not subtend quadrants of a circumscribed circle. A figure with this property must have its sides standing also at right angles. Taking in therefore this last consideration respecting the manner of combining the parts, the idea is fully described, and the definition thereby rendered complete. For a figure bounded by four equal sides, joined together at right angles, has the

12  
Two things required in a definition, to enumerate the ideas, and explain the manner of their combinations.



the property required; and is moreover the only right lined figure to which that property belongs.

14  
How we are to proceed to arrive at just and adequate definitions.

VIII. It will now be obvious to every one in what manner we ought to proceed, in order to arrive at just and adequate definitions. First, we are to take an exact view of the idea to be described, trace it to its original principles, and mark the several simple perceptions that enter into the composition of it. Secondly, we are to consider the particular manner in which these elementary ideas are combined, in order to the forming of that precise conception for which the term we make use of stands. When this is done, and the idea wholly unravelled, we have nothing more to do than fairly transcribe the appearance it makes to our own minds. Such a description, by distinctly exhibiting the order and number of our primitive conceptions, cannot fail to excite at the same time in the mind of every one that reads it, the complex idea resulting from them; and therefore attains the true and proper end of a definition.

CHAP. III. *Of the Composition and Resolutions of our Ideas, and the Rules of Definition thence arising.*

15  
In compounding our ideas, we proceed by a successive gradation.

I. THE rule laid down in the foregoing chapter is general, extending to all possible cases; and is indeed that to which alone we can have recourse, where any doubt or difficulty arises. It is not however necessary that we should practise it in every particular instance. Many of our ideas are extremely complicated, inasmuch that to enumerate all the simple perceptions out of which they are formed, would be a very troublesome and tedious work. For this reason logicians have established certain compendious rules of defining, of which it may not be amiss here to give some account. But in order to the better understanding of what follows, it will be necessary to observe that there is a certain gradation in the composition of our ideas. The mind of man is very limited in its views, and cannot take in a great number of objects at once. We are therefore fain to proceed by steps, and make our first advances subservient to those which follow. Thus in forming our complex notions, we begin at first with but a few simple ideas, such as we can manage with ease, and unite them together into one conception. When we are provided with a sufficient flock of these, and have by habit and use rendered them familiar to our minds, they become the component parts of other ideas still more complicated, and form what we may call a second order of compound notions. This process, as is evident, may be continued to any degree of composition we please, mounting from one stage to another, and enlarging the number of combinations.

16  
Hence ideas of this class acquire a mind forming with the last and highest order of ideas, finds it much the most expedient method to proceed gradually thorough all the intermediate steps. For, was he to take any very compound idea to pieces, and, without regard to the several classes of simple perceptions that have already been formed into distinct combinations, break it at once into its original principles, the number would be so great as perfectly to confound the imagination, and overcome the utmost reach and capacity of the mind. When we see

a prodigious multitude of men jumbled together in crowds, without order or any regular position, we find it impossible to arrive at an exact knowledge of their number. But if they are formed into separate battalions, and so stationed as to fall within the leisure survey of the eye; by viewing them successively and in order, we come to an easy and certain determination. It is the same in our complex ideas. When the original perceptions, out of which they are framed, are very numerous, it is not enough that we take a view of them in loose and scattered bodies; we must form them into distinct classes, and unite these classes in a just and orderly manner, before we can arrive at a true knowledge of the compound notions resulting from them.

III. This gradual progress of the mind to its compound notions, through a variety of intermediate steps, plainly points out the manner of conducting the definitions, by which these notions are conveyed into the minds of others. For as the series begins with simple and easy combinations, and advances through a succession of different orders, rising one above another in the degree of composition; it is evident that, in a train of definitions expressing these ideas, a like gradation is to be observed. Thus the complex ideas of the lowest order can no otherwise be described than by enumerating the simple ideas out of which they are made, and explaining the manner of their union. But then in the second, or any other succeeding order; as they are formed out of those gradual combinations, and continue the inferior classes, it is not necessary, in describing them, to mention one by one all the simple ideas of which they consist. They may be more distinctly and briefly unfolded, by enumerating the compound ideas of a lower order, from whose union they result, and which are all supposed to be already known in consequence of previous definitions. Here then it is that the logical method of defining takes place; which that it may be the better understood, we shall explain somewhat more particularly the several steps and gradations of the mind in compounding its ideas, and thence deduce that peculiar form of a definition which logicians have thought fit to establish.

IV. All the ideas we receive from the several objects of nature that surround us, represent distinct individuals. These individuals, when compared together, are found in certain particulars to resemble. Hence, by collecting the resembling particulars into one conception, we form the notion of a *species*. And here let it be observed, that this last idea is less complicated than that by which we represent any of the particular objects contained under it. For the idea of the species excludes the peculiarities of the several individuals, and retains only such properties as are common to them all. Again, by comparing several species together, and observing their resemblance, we form the idea of a *genus*; where, in the same manner as before, the composition is lessened, because we leave out what is peculiar to the several species compared, and retain only the particulars wherein they agree. It is easy to conceive the mind proceeding thus from one step to another, and advancing through its several classes of general notions, until at last it

17  
Our definitions should keep pace with our ideas, and observe a like gradation.

18  
The steps by which the mind proceeds from particular to general ideas.

comes

comes to the highest genus of all, denoted by the word *being*, where the bare idea of existence is only concerned.

19 The con-  
duct of the  
mind in  
compound-  
ing its i-  
deas, as it  
advances  
thro' the  
different  
orders of  
perception.

V. In this procedure we see the mind unravelling a complex idea, and tracing it in the ascending scale, from greater or less degrees of composition, until it terminates in one simple perception. If now we take the series the contrary way, and, beginning with the last or highest genus, carry our view downwards, through all the inferior genera and species, quite to the individuals, we shall thereby arrive at a distinct apprehension of the conduct of the understanding in compounding its ideas. For, in the several classes of our perceptions, the highest in the scale is for the most part made up of but a few simple ideas, such as the mind can take in and survey with ease. This first general notion, when branched out into the different subdivisions contained under it, has in every one of them something peculiar, by which they are distinguished among themselves; inasmuch that, in descending from the genus to the species, we always superadd some new idea, and thereby increase the degree of composition. Thus the idea denoted by the word *figure* is of a very general nature, and composed of but few simple perceptions, as implying no more than space every-where abounded. But if we descend further, and consider the boundaries of this space, as that they may be either lines or surface, we fall into the several species of figure. For where the space is bounded by one or more surfaces, we give it the name of a *solid figure*; but where the boundaries are lines, it is called a *plain figure*.

20 The idea of  
the species  
found by  
superadd-  
ing the  
specific dif-  
ference to  
the genus.

VI. In this view of things it is evident, that the species is formed by superadding a new idea to the genus. Here, for instance, the genus is circumscribed space. If now to this we superadd the idea of a circumscription by lines, we frame the notion of that species of figures which are called *plain*; but if we conceive the circumscription to be by surfaces, we have the species of solid figures. This superadded idea is called the *specific difference*, not only as it serves to divide the species from the genus, but because, being different in all the several subdivisions, we thereby also distinguish the species one from another. And as it is likewise that conception, which, by being joined to the general idea, compleats the notion of the species; hence it is plain, that the genus and specific difference are to be considered as the proper and constituent parts of the species. If we trace the progress of the mind still farther, and observe it advancing through the inferior species, we shall find its manner of proceeding to be always the same. For every lower species is formed by superadding some new idea to the species next above it; inasmuch that in this descending scale of our perceptions, the understanding passes through different orders of complex notions, which become more and more complicated at every step it takes. Let us resume here, for instance, the species of plain figures. They imply no more than space bounded by lines. But if we take in an additional consideration of the nature of these lines, as whether they are *right* or *curved*, we fall into the subdivisions of plain figure, distinguished by the names of *rectilinear*, *curvilinear*, and *mixtilinear*.

VII. And here we are to observe, that though plain figures, when considered as one of those branches that come under the notion of figure in general, take the name of a species; yet compared with the classes of curvilinear, rectilinear, and mixtilinear, into which they themselves may be divided, they really become a genus, of which the before mentioned subdivisions constitute the several species. These species, in the same manner as in the case of plain and solid figures, consist of the genus and specific difference as their constituent parts. For in the curvilinear kind, the curvity of the lines bounding the figure makes what is called the *specific difference*; to which if we join the genus, which here is a plain figure, or space circumscribed by lines, we have all that is necessary towards completing the notion of this species. We are only to take notice, that this last subdivision, having two genera above it, *viz.* plain figure, and figure in general; the genus joined with the specific difference, in order to constitute the species of curvilinears, is that which lies nearest to the said species. It is the notion of plain figure, and not of figure in general, that joined with the idea of curvity makes up the complex conception of curve-lined figures. For in this descending scale of our ideas, figure in general, plain figures, curve-lined figures, the two first are considered as genera in respect of the third; and the second in order, or that which stands next to the third, is called the *nearest genus*. But now as it is this second idea, which, joined with the notion of curvity, forms the species of curve-lined figures; it is plain, that the third or last idea in the series is made up of the nearest genus and specific difference. This rule holds invariably, however far the series is continued; because, in a train of ideas thus succeeding one another, all that precede the last are considered as so many genera in respect of that last; and the last itself is always formed by superadding the specific difference to the genus next it.

VIII. Here then we have an universal description, applicable to all our ideas of whatever kind, from the highest genus to the lowest species. For, taking them in order downwards from the said general idea, they every where consist of the *genus proximum*, and *differentia specifica*, as logicians love to express themselves. But when we come to the lowest species of all, comprehending under it only individuals, the superadded idea, by which these individuals are distinguished one from another, no longer takes the name of the specific difference. For here it serves not to denote distinct species, but merely a variety of individuals, each of which, having a particular existence of its own, is therefore numbered different from every other of the same kind. We must also observe, that in this last case, logicians chuse to give the superadded idea by the name of the *numerical difference*; inasmuch that, as the idea of a species is made up of the nearest genus and specific difference, so the idea of an individual consists of the lowest species and numeric difference. Thus the circle is a species of curve-lined figures, and what we call the *lowest species*, as comprehending under it only individuals. Circles in particular are distinguished from one another by the length and position of their diameters. The length therefore

21 And in all  
the inferior  
species, by  
superadd-  
ing the  
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ference to  
the nearest  
genus.

22 The idea of  
any individ-  
ual compos-  
ed of  
the lowest  
species and  
numeric  
difference.

and position of the diameter of a circle is what logicians call the *numerical difference*; because, these being given, the circle itself may be described, and an individual thereby constituted.

23  
Definitions to follow one another in train, and pass thro' the same successive gradations as our compound ideas.

IX. Thus the mind, in compounding its ideas, begins, we see, with the most general notions, which, consisting of but a few simple notions, are easily combined and brought together into one conception. Thence it proceeds to the species comprehended under this general idea, and these are formed by joining together the genus and specific difference. And as it often happens, that these species may be still farther subdivided, and run on in a long series of continued gradations, producing various orders of compound perceptions; so all these several orders are regularly and successively formed by annexing in every step the specific difference to the nearest genus. When by this method of procedure we are come to the lowest order of all, by joining the species and numeric difference we frame the ideas of individuals. And here the series necessarily terminates, because it is impossible any farther to bound or limit our conceptions. This view of the composition of our ideas, representing their constituent parts in every step of the progression, naturally points out the true and genuine form of a definition. For as definitions are no more than descriptions of the ideas for which the terms designed stand; and as ideas are then described, when we enumerate distinctly and in order the parts of which they consist; it is plain that, by making our definitions follow one another according to the natural train of our conceptions, they will be subject to the

same rules, and keep pace with the ideas they describe.

X. As therefore the first order of our compound notions, or the ideas that constitute the highest genera in the different scales of perception, are formed by uniting together a certain number of simple notions; so the terms expressing these genera are defined by *enumerating the simple notions so combined*. And as the species comprehended under any genus, or the complex ideas of the second order, arise from superadding the specific difference to the said general idea; so the definition of the names of the species is absolved, in a detail of the ideas of the specific difference, connected with the term of the genus. For the genus having been before defined, the term by which it is expressed stands for a known idea, and may therefore be introduced into all subsequent definitions, in the same manner as the names of simple perceptions. It will now be sufficiently obvious, that the definitions of all the succeeding orders of compound notions will every where consist of the term of the nearest genus, joined with an enumeration of the ideas that constitute the specific difference; and that the definition of individuals unites the names of the lowest species with the terms by which we express the ideas of the numeric difference.

XI. Here then we have the true and proper form of a definition, in all the various orders of conception. This is that method of defining which is commonly called *logical*, and which we see is perfect in its kind, inasmuch as it presents a full and adequate description of the idea for which the term defined stands.

## P A R T II. OF J U D G M E N T.

### CHAP. I. *Of the Grounds of human Judgment.*

25  
Intuition respects the relations between our ideas when they are immediately perceivable.

THE mind being furnished with ideas, its next step in the way to knowledge is, the comparing these ideas together, in order to judge of their agreement or disagreement. In this joint view of our ideas, if the relation is such as to be immediately discoverable by the bare inspection of the mind, the judgments thence obtained are called *intuitive*; from a word that denotes *to look at*; for in this case, a mere attention to the ideas compared suffices to let us see how far they are connected or disjointed. Thus, *that the Whole is greater than any of its Parts*, is an intuitive judgment, nothing more being required to convince us of its truth, than an attention to the ideas of *whole* and *part*. And this too is the reason why we call the act of the mind forming these judgments, *intuition*; as it is indeed no more than an immediate preception of the agreement or disagreement of any two ideas.

26  
Experience and testimony the ground of judging as to facts.

II. But here it is to be observed, that our knowledge of this kind respects only our ideas, and the relations between them; and therefore can serve only as a foundation to such reasonings as are employed in investigating these relations. Now it so happens, that many of our judgments are conversant about facts, and the real existence of things, which cannot be tra-

ced by the bare contemplation of our ideas. It does not follow, because I have the idea of a circle in my mind, that therefore a figure answering to that idea has a real existence in nature. I can form to myself the notion of a centaur, or golden mountain, but never imagine on that account, that either of them exist. What then are the grounds of our judgment in relation to facts? *experience* and *testimony*. By experience we are informed of the existence of the several objects which surround us, and operate upon our senses. Testimony is of a wider extent, and reaches not only to objects beyond the present sphere of our observation, but also to facts and transactions, which being now past, and having no longer any existence, could not without this conveyance have fallen under our cognizance.

III. Here we have three foundations of human judgment, from which the whole system of our knowledge may with ease and advantage be derived. First, intuition, which respects our ideas themselves, and their relations, and is the foundation of that species of reasoning which we call *demonstration*. For whatever is deduced from our intuitive perceptions, by a clear and connected series of proofs, is said to be demonstrated, and produces absolute certainty in the mind. Hence the knowledge obtained in this manner is what we properly term *science*; because in eve-

24  
The form of a definition in all the various orders of conception.

27  
Three foundations of human judgment, viz. 1. Intuition, the ground of scientific knowledge.



ry step of the procedure it carries its own evidence along with it, and leaves no room for doubt or hesitation. And what is highly worthy of notice; as the truths of this class express the relation between our ideas, and the same relations must ever and invariably subsist between the same ideas, our deductions in the way of science constitute what we call *eternal, necessary, and immutable truths*. If it be true that the whole is equal to all its parts, it must be so unchangeably; because the relation of equality being attached to the ideas themselves, must ever intervene where the same ideas are compared. Of this nature are all the truths of natural religion, morality, and mathematics, and, in general, whatever may be gathered from the bare view and consideration of our ideas.

28  
2. Experience, the ground of our knowledge of the powers and qualities of bodies.

IV. The second ground of human judgment is *experience*; from which we infer the existence of those subjects that surround us, and fall under the immediate notice of our senses. When we see the sun, or cast our eyes towards a building, we not only have ideas of these objects within ourselves, but ascribe to them a real existence out of the mind. It is also by the information of the senses, that we judge of the qualities of bodies; as when we say that *snow is white, fire hot, or steel hard*. For as we are wholly unacquainted with the internal structure and constitution of the bodies that produce these sensations in us, nay, and are unable to trace any connection between that structure and the sensations themselves, it is evident, that we build our judgments altogether upon observation, ascribing to bodies such qualities as are answerable to the perceptions they excite in us. But this is not the only advantage derived from experience, for to that too are we indebted for all our knowledge regarding the co-existence of sensible qualities in objects, and the operations of bodies one upon another. Ivory, for instance, is hard and elastic; this we know by experience, and indeed by that alone. For, being altogether strangers to the true nature both of elasticity and hardness, we cannot by the bare contemplation of our ideas determine how far the one necessarily implies the other, or whether there may not be a repugnance between them. But when we observe them to exist both in the same object, we are then assured from experience, that they are not incompatible; and when we also find, that a stone is hard and not elastic, and that air though elastic is not hard, we also conclude upon the same foundation, that the ideas are not necessarily conjoined, but may exist separately in different objects. In like manner with regard to the operations of bodies one upon another, it is evident, that our knowledge this way is all derived from observation. *Aqua regia* dissolves gold, as has been found by frequent trial, nor is there any other way of arriving at the discovery. Naturalists may tell us, if they please, that the parts of *aqua regia* are of a texture apt to insinuate between the corpuscles of gold, and thereby loosen and shake them asunder. If this is a true account of the matter, it will notwithstanding be allowed, that our conjecture in regard to the conformation of these bodies is deduced from the experiment, and not the experiment from the conjecture. It was not from any previous knowledge of the intimate structure of *aqua regia* and

gold, and the aptness of their parts to act or to be acted upon, that we came by the conclusion above-mentioned. The internal constitution of bodies is in a manner wholly unknown to us; and could we even surmount this difficulty, yet as the separation of the parts of gold implies something like an active force in the *menstruum*, and we are unable to conceive how it comes to be possessed of this activity; the effect must be owned to be altogether beyond our comprehension. But when repeated trials had once confirmed it, inasmuch that it was admitted as an established truth in natural knowledge, it was then easy for men to spin out theories of their own invention, and contrive such a structure of parts, both for *gold* and *aqua regia*, as would best serve to explain the phenomenon upon the principles of that system of philosophy they had adopted.

V. From what has been said it is evident, that as intuition is the foundation of what we call *scientific* knowledge, so is experience of *natural*. For this last being wholly taken up with objects of sense, or those bodies that constitute the natural world; and their properties, as far as we can discover them, being to be traced only by a long and painful series of observations; it is apparent, that in order to improve this branch of knowledge, we must betake ourselves to the method of trial and experiment.

VI. But though experience is what we may term the immediate foundation of natural knowledge, yet with respect to particular persons its influence is very narrow and confined. The bodies that surround us are numerous, many of them lie at a great distance, and some quite beyond our reach. Life is too short, and so crowded with cares, that but little time is left for any single man to employ himself in unfolding the mysteries of nature. Hence it is necessary to admit many things upon the testimony of others, which by this means becomes the foundation of a great part of our knowledge of body. No man doubts of the power of *aqua regia* to dissolve gold, though perhaps he never himself made the experiment. In these therefore and such like cases we judge of the facts and operations of nature, upon the mere ground of testimony. However, as we can always have recourse to experience where any doubt or scruple arises, this is justly considered as the true foundation of natural philosophy; being indeed the ultimate support upon which our assent rests, and whereto we appeal when the highest degree of evidence is required.

VII. But there are many facts that will not allow of an appeal to the senses, and in this case testimony is the true and only foundation of our judgments. All human actions of whatever kind, when considered as already past, are of the nature here described; because having now no longer any existence, both the facts themselves, and the circumstances attending them, can be known only from the relations of such as had sufficient opportunities of arriving at the truth. *Testimony* therefore is justly accounted a third ground of human judgment; and as from the other two we have deduced *scientific* and *natural* knowledge, so we may from this derive *historical*; by which we mean, not merely a knowledge of the civil transactions of states and kingdoms, but of all facts whatsoever

29  
3. Testimony, the ground of historical knowledge.

ever, where testimony is the ultimate foundation of our belief.

### CHAP. II. Of Affirmative and Negative Propositions.

<sup>30</sup> The subject and predicate of a proposition explained.

I. WHILE the comparing of our ideas is considered merely as an act of the mind, assembling them together, and joining or disjoining them according to the result of its perceptions, we call it *judgment*; but when our judgments are put into words, they then bear the name of *propositions*. A proposition therefore is a sentence expressing some judgment of the mind, whereby two or more ideas are affirmed to agree or disagree.

Now as our judgments include at least two ideas, one of which is affirmed or denied of the other, so must a proposition have terms answering to these ideas. The idea of which we affirm or deny, and of course the term expressing that idea, is called the *subject* of the proposition. The idea affirmed or denied, as also the term answering it, is called the *predicate*. Thus in the proposition, *God is omnipotent*: *God* is the subject, it being of him that we affirm omnipotence; and *omnipotent* is the predicate, because we affirm the idea expressed by that word to belong to God.

<sup>31</sup> The copula &c.

II. But as in propositions, ideas are either joined or disjoined; it is not enough to have terms expressing those ideas, unless we have also some words to denote their agreement or disagreement. That word in a proposition, which connects two ideas together, is called the *copula*; and if a negative particle be annexed, we thereby understand that the ideas are disjoined. The *substantive verb* is commonly made use of for the copula, as in the above-mentioned proposition, *God is omnipotent*; where *is* represents the copula, and signifies the agreement of the ideas of *God* and *omnipotence*. But if we mean to separate two ideas; then, besides the substantive verb, we must also use some particle of negation, to express this repugnance. The proposition, *man is not perfect*, may serve as an example of this kind, where the notion of *perfection* being removed from the idea of *man*, the negative particle *not* is inserted after the copula, to signify the disagreement between the subject and predicate.

<sup>32</sup> Propositions sometimes expressed by a single word.

III. Every proposition necessarily consists of these three parts; but then it is not alike needful that they be all severally expressed in words; because the copula is often included in the term of the predicate, as when we say, *he sits*; which imports the same as *he is sitting*. In the Latin language, a single word has often the force of a whole sentence. Thus *ambulat* is the same as *ille est ambulans*; *amo*, as *ego sum amans*, and so in innumerable other instances; by which it appears, that we are not so much to regard the number of words in a sentence, as the ideas they represent, and the manner in which they are put together. For wherever two ideas are joined or disjoined in an expression, though of but a single word, it is evident that we have a subject, predicate, and copula, and of consequence a complete proposition.

<sup>33</sup> Affirmative and negative propositions.

IV. When the mind joins two ideas, we call it an *affirmative* judgment; when it separates them, a *negative*; and as any two ideas compared together must necessarily either agree or not agree, it is evident, that all our judgments fall under these two divi-

sions. Hence likewise the propositions expressing these judgments are all either affirmative or negative. An affirmative proposition connects the predicate with the subject, as *a stone is heavy*; a negative proposition separates them, as *God is not the author of evil*. *Affirmation* therefore is the same as joining two ideas together, and this is done by means of the copula. *Negation* on the contrary marks a repugnance between the ideas compared, in which case a negative particle must be called in, to shew that the connection included in the copula does not take place.

V. Hence we see the reason of the rule commonly laid down by logicians; that in all negative propositions the negation ought to affect the copula. For as the copula, when placed by itself, between the subject and the predicate, manifestly binds them together; it is evident, that, in order to render a proposition negative, the particles of negation must enter it in such a manner as to destroy this union. In a word, then only are two ideas disjoined in a proposition, when the negative particle may be so referred to the copula, as to break the affirmation included in it, and undo that connection it would otherwise establish. When we say, for instance, *No man is perfect*; take away the negation, and the copula of itself plainly unites the ideas in the proposition. But as this is the very reverse of what is intended, a negative mark is added, to shew that this union does not here take place. The negation therefore, by destroying the effect of the copula, changes the very nature of the proposition, inasmuch that, instead of binding two ideas together, it denotes their separation. On the contrary, in this sentence; *The man who departs not from an upright behaviour, is beloved of God*: the predicate *beloved of God* is evidently affirmed of the subject *an upright man*; so that, notwithstanding the negative particle, the proposition is still affirmative. The reason is plain; the negation here affects not the copula, but making properly a part of the subject, serves with other terms in the sentence, to form one complex idea, of which the predicate *beloved of God*, is directly affirmed.

### CHAP. III. Of Universal and Particular Propositions.

<sup>34</sup> Division of propositions into universal and particular.

I. THE next considerable division of propositions is into *universal* and *particular*. Our ideas, according to what has been already observed in the first Part, are all singular as they enter the mind, and represent individual objects. But as by abstraction we can render them universal, so as to comprehend a whole class of things, and sometimes several classes at once; hence the terms expressing these ideas must be in like manner universal. If therefore we suppose any general term to become the subject of a proposition, it is evident, that whatever is affirmed of the abstract idea belonging to that term may be affirmed of all the individuals to which that idea extends. Thus when we say, *Men are mortal*; we consider mortality, not as confined to one or any number of particular men, but as what may be affirmed without restriction of the whole species. By this means the proposition becomes as general as the idea which makes the subject of it, and indeed derives its universality intirely from that idea, being more or less so according as this may be

( b ) extended

extended to more or fewer individuals. But it is further to be observed of these general terms, that they sometimes enter a proposition in their full latitude, as in the example given above; and sometimes appear with a mark of limitation. In this last case we are given to understand, that the predicate agrees not to the whole universal idea, but only to a part of it; as in the proposition, *some men are wise*: For here wisdom is not affirmed of every particular man, but restrained to a few of the human species.

36  
Propositions universal where the subject is so, without a mark of restriction.

II. Now from this different appearance of the general idea, that constitutes the subject of any judgment, arises the division of propositions into *universal* and *particular*. An universal proposition is that wherein the subject is some general term taken in its full latitude, inasmuch that the predicate agrees to all the individuals comprehended under it, if it denotes a proper species; and to all the several species, and their individuals, if it marks an idea of a higher order. The words *all*, *every*, *no*, *none*, &c. are the proper signs of this universality; and as they seldom fail to accompany general truths, so they are the most obvious criterion whereby to distinguish them. *All animals have a power of beginning motion*. This is an universal proposition; as we know from the word *all* prefixed to the subject *animal*, which denotes that it must be taken in its full extent. Hence the power of beginning motion may be affirmed of all the several species of animals.

37  
Propositions particular where some universal subject appears with a mark of limitation.

III. A *particular* proposition has in like manner some general term for its subject, but with a mark of limitation added, to denote, that the predicate agrees only to some of the individuals comprehended under a species, or to one or more of the species belonging to any genus, and not to the whole universal idea. Thus, *Some stones are heavier than iron*; *some men have an uncommon share of prudence*. In the last of these propositions, the subject *some men* implies only a certain number of individuals, comprehended under a single species. In the former, where the subject is a genus that extends to a great variety of distinct classes, *some stones* may not only imply any number of particular stones, but also several whole species of stones; inasmuch as there may be not a few with the property there described. Hence we see that a proposition does not cease to be particular by the predicate's agreeing to a whole species, unless that species, singly and distinctly considered, makes also the subject of which we affirm or deny.

38  
Singular propositions contained under the head of particulars.

IV. There is still one species of propositions that remains to be described, and which the more deserves our notice, as it is not yet agreed among logicians to which of the two classes mentioned above they ought to be referred; namely, *singular* propositions, or those where the subject is an individual. Of this nature are the following: *Sir Isaac Newton was the inventor of fluxions*; *this book contains many useful truths*. What occasions some difficulty as to the proper rank of these propositions is; that the subject being taken according to the whole of its extension, they sometimes have the same effect in reasoning as universals. But if it be considered that they are in truth the most limited kind of particular propositions, and that no proposition can with any propriety be called universal but where

the subject is some universal idea; we shall not be long in determining to which class they ought to be referred. When we say, *Some books contain useful truths*; the proposition is particular, because the general term appears with a mark of restriction. If therefore we say, *This book contains useful truths*; it is evident that the proposition must be still more particular, as the limitation implied in the word *this* is of a more confined nature than in the former case.

V. We see therefore that all propositions are either *affirmative* or *negative*; nor is it less evident, that in both cases they may be *universal* or *particular*. Hence arises that celebrated fourfold division of them into *universal affirmative* and *universal negative*, *particular affirmative* and *particular negative*, which comprehends indeed all their varieties. The use of this method of distinguishing them will appear more fully afterwards, when we come to treat of reasoning and syllogism.

#### CHAP. IV. Of Absolute and Conditional Propositions.

I. The objects about which we are chiefly conversant in this world, are all of a nature liable to change. What may be affirmed of them at one time cannot often at another; and it makes no small part of our knowledge to distinguish rightly these variations, and trace the reasons upon which they depend. For it is observable, that amidst all the vicissitude of nature, some things remain constant and invariable; nor even are the changes to which we see others liable, effected, but in consequence of uniform and steady laws, which, when known, are sufficient to direct us in our judgments about them. Hence philosophers, in distinguishing the objects of our perception into various classes, have been very careful to note, that some properties belong essentially to the general idea, so as not to be separable from it but by destroying its very nature; while others are only accidental, and may be affirmed or denied of it in different circumstances. Thus solidity, a yellow colour, and great weight are considered as essential qualities of gold; but whether it shall exist as an uniform conjoined mass, is not alike necessary. We see that by a proper menstruum it may be reduced to a fine powder, and that an intense heat will bring it into a state of fusion.

II. From this diversity in the several qualities of things arises a considerable difference as to the manner of our judging about them. For all such properties as are inseparable from objects, when considered as belonging to any genus or species, are affirmed absolutely, and without reserve of that general idea. Thus we say; *Gold is very weighty*, *a stone is hard*, *animals have a power of self-motion*. But in the case of mutable or accidental qualities, as they depend upon some other consideration distinct from the general idea; that also must be taken into the account, in order to form an accurate judgment. Should we affirm, for instance, of some stones, that they are very susceptible of a rolling motion; the proposition, while it remains in this general form, cannot with any advantage be introduced into our reasonings. An aptness to receive that mode of motion flows from the figure of the stone; which, as it may vary infinitely, our judgment then only becomes applicable and determinate,

39  
The fourfold division of propositions.

40  
Distinction of qualities into essential and accidental.

41  
Hence a considerable diversity in our manner of judging.



nate, when the particular figure, of which volubility is a consequence, is also taken into the account. Let us then bring in this other consideration, and the proposition will run as follows: *Stones of a spherical form are easily put into a rolling motion.* Here we see the condition upon which the predicate is affirmed, and therefore know in what particular cases the proposition may be applied.

42  
Which gives rise to the division of propositions into absolute and conditional.

III. This consideration of propositions respecting the manner in which the predicate is affirmed of the subject gives rise to the division of them into *absolute* and *conditional*. *Absolute* propositions are those wherein we affirm some property inseparable from the idea of the subject, and which therefore belongs to it in all possible cases; as *God is infinitely wise. Virtue tends to the ultimate happiness of man.* But where the predicate is not necessarily connected with the idea of the subject, unless upon some consideration distinct from that idea, there the proposition is called *conditional*. The reason of the name is taken from the supposition annexed, which is of the nature of a condition, and may be expressed as such. Thus, *If a stone is exposed to the rays of the sun, it will contract some degree of heat. If a river runs in a very declining channel, its rapidity will constantly increase.*

43  
The great importance of this division, as it renders propositions determinate,

IV. There is not any thing of greater importance in philosophy than a due attention to this division of propositions. If we are careful never to affirm things absolutely but where the ideas are inseparably conjoined; and if in our other judgments we distinctly mark the conditions which determine the predicate to belong to the subject; we shall be the less liable to mistake in applying general truths to the particular concerns of human life. It is owing to the exact observance of this rule that mathematicians have been so happy in their discoveries, and that what they demonstrate of magnitude in general may be applied with ease in all obvious occurrences.

44  
And reduces them from particulars to generals.

V. The truth of it is, particular propositions are then known to be true, when we can trace their connection with universals; and it is accordingly the great business of science to find out general truths that may be applied with safety in all obvious instances. Now the great advantage arising from determining with care the conditions upon which one idea may be affirmed or denied of another is this: that thereby particular propositions really become universal, may be introduced with certainty into our reasonings, and serve as standards to conduct and regulate our judgments. To illustrate this by a familiar instance: if we say, *Some water acts very forcibly*; the proposition is particular: and as the conditions on which this forcible action depends are not mentioned, it is as yet uncertain in what cases it may be applied. Let us then supply these conditions, and the proposition will run thus: *Water conveyed in sufficient quantity along a steep descent acts very forcibly.* Here we have an universal judgment, inasmuch as the predicate *forcible action* may be ascribed to all water under the circumstances mentioned. Nor is it less evident that the proposition in this new form is of easy application; and in fact we find that men do apply it in instances where the forcible action of water is required; as in corn-mills and many other works of art.

#### CHAP. V. Of Simple and Compound Propositions.

45

I. HITHERTO we have treated of propositions, where only two ideas are compared together. These are in the general called *simple*; because, having but one subject and one predicate, they are the effect of a simple judgment that admits of no subdivision. But if it so happens that several ideas offer themselves to our thoughts at once, whereby we are led to affirm the same thing of different objects, or different things of the same object; the propositions expressing these judgments are called *compound*: because they may be resolved into as many others as there are subjects or predicates in the whole complex determination of the mind. Thus, *God is infinitely wise and infinitely powerful.* Here there are two predicates, *infinite wisdom* and *infinite power*, both affirmed of the same subject; and accordingly the proposition may be resolved into two others, affirming these predicates severally. In like manner in the proposition, *Neither kings nor people are exempt from death*; the predicate is denied of both subjects, and may therefore be separated from them in distinct propositions. Nor is it less evident that if a complex judgment consists of several subjects, and predicates, it may be resolved into as many simple propositions as are the number of different ideas compared together. *Riches and honours are apt to elate the mind, and increase the number of our desires.* In this judgment there are two subjects and two predicates, and it is at the same time apparent that it may be resolved into four distinct propositions. *Riches are apt to elate the mind. Riches are apt to increase the number of our desires. And so of honours.*

46

II. Logicians have divided these compound propositions into a great many different classes; but, in our opinion, not with a due regard to their proper definition. Thus *conditionals, causals, relatives, &c.* are mentioned as so many distinct species of this kind, though in fact they are no more than simple propositions. To give an instance of a conditional; *If a stone is exposed to the rays of the sun, it will contract some degree of heat.* Here we have but one subject and one predicate; for the complex expression, *A stone exposed to the rays of the sun*, constitutes the proper subject of this proposition, and is no more than one determinate idea. The same thing happens in causals. *Rehoboam was unhappy because he followed evil counsel.* There is here an appearance of two propositions arising from the complexity of the expression; but when we come to consider the matter more nearly, it is evident that we have but a single subject and predicate. *The pursuit of evil counsel brought misery upon Rehoboam.* It is not enough therefore to render a proposition compound, that the subject and predicate are complex notions, requiring sometimes a whole sentence to express them: for in this case the comparison is still confined to two ideas, and constitutes what we call a simple judgment. But where there are several subjects or predicates, or both, as the affirmation or negation may be alike extended to them all, the proposition expressing such a judgment is truly a collection of as many simple ones as there are different ideas compared. Confining ourselves therefore to this more strict and just notion

45  
Division of propositions into simple and compound.

46  
The proper notion of a compound proposition ascertained.

of compound propositions, they are all reducible to two kinds, viz. *copulatives* and *disjunctives*.

47  
Compound  
proposi-  
tions, either  
copulative:

III. A *copulative* proposition is, where the subjects and predicates are so linked together, that they may be all severally affirmed or denied one of another. Of this nature are the examples of compound propositions given above. *Riches and honours are apt to elate the mind, and increase the number of our desires. Neither kings nor people are exempt from death.* In the first of these the two predicates may be affirmed severally of each subject, whence we have four distinct propositions. The other furnishes an example of the negative kind, where the same predicate, being disjoined from both subjects, may be also denied of them in separate propositions.

48  
Or disjunc-  
tive.

IV. The other species of compound propositions are those called *disjunctives*; in which, comparing several predicates with the same subject; we affirm that one of them necessarily belongs to it, but leave the particular predicate undetermined. If any one for example says, *This world either exists of itself, or is the work of some all-wise and powerful cause*, it is evident that one of the two predicates must belong to the world; but as the proposition determines not which, it is therefore of the kind we call *disjunctive*. Such too are the following: *The sun either moves round the earth, or is the centre about which the earth revolves. Friendship finds men equal, or makes them so.* It is the nature of all propositions of this class, supposing them to be exact in point of form, that upon determining the particular predicate, the rest are of course to be removed; or if all the predicates but one are removed, that one necessarily takes place. Thus in the example given above; if we allow the world to be the work of some wise and powerful cause, we of course deny it to be self-existent; or if we deny it to be self-existent, we must necessarily admit that it was produced by some wise and powerful cause. Now this particular manner of linking the predicates together, so that the establishing one displaces all the rest; or the excluding all but one necessarily establishes that one; cannot otherwise be effected than by means of *disjunctive* particles. And hence it is that propositions of this class take their names from these particles which make so necessary a part of them, and indeed constitute their very nature considered as a distinct species.

#### CHAP. VI. Of the Division of Propositions into Self-evident and Demonstrable.

49  
Proposi-  
tions divided  
into self-  
evident and  
demonstra-  
ble.

I. WHEN any proposition is offered to the view of the mind, if the terms in which it is expressed and understood; upon comparing the ideas together, the agreement or disagreement asserted is either immediately perceived, or found to lie beyond the present reach of the understanding. In the first case the proposition is said to be *self-evident*, and admits not of any proof, because a bare attention to the ideas themselves produces full conviction and certainty; nor is it possible to call in any thing more evident by way of confirmation. But where the connection or repugnance comes not so readily under the inspection of the mind, there we must have recourse to reasoning; and if by a clear series of proofs we can make out the

truth proposed, inasmuch that self-evidence shall accompany every step of the procedure, we are then able to demonstrate what we assert, and the proposition itself is said to be *demonstrable*. When we affirm, for instance, that it is impossible for the same thing to be and not to be; whoever understands the terms made use of perceives at first glance the truth of what is asserted, nor can he by any efforts bring himself to believe the contrary. The proposition therefore is *self-evident*, and such that it is impossible by reasoning to make it plainer; because there is no truth more obvious or better known, from which as a consequence it may be deduced. But if we say, *This world had a beginning*; the assertion is indeed equally true, but shines not forth with the same degree of evidence. We find great difficulty in conceiving how the world could be made out of nothing; and are not brought to a free and full consent, until by reasoning we arrive at a clear view of the absurdity involved in the contrary supposition. Hence this proposition is of the kind we call *demonstrable*, inasmuch as its truth is not immediately perceived by the mind, but yet may be made appear by means of others more known and obvious, whence it follows as an unavoidable consequence.

II. From what has been said it appears, that reasoning is employed only about demonstrable propositions, and that our intuitive and self-evident perceptions, are the ultimate foundation on which it rests.

III. Self-evident propositions furnish the first principles of reasoning; and it is certain, that if in our researches we employ only such principles as have this character of self-evidence, and apply them according to the rules to be afterwards explained, we shall be in no danger of error in advancing from one discovery to another. For this I may appeal to the writings of the mathematicians, which, being conducted by the express model here mentioned, are an incontestible proof of the firmness and stability of human knowledge, when built upon so sure a foundation. For not only have the propositions of this science stood the test of ages; but are found attended with that invincible evidence, as forces the assent of all who duly consider the proofs upon which they are established.

IV. First then it is to be observed, that they have been very careful in ascertaining their ideas, and fixing the signification of their terms. For this purpose they begin with *definitions*, in which the meaning of their words is so distinctly explained, that they cannot fail to excite in the mind of an attentive reader the very same ideas as are annexed to them by the writer. And indeed the clearness and irresistible evidence of mathematical knowledge is owing to nothing so much as this care in laying the foundation. Where the relation between any two ideas is accurately and justly traced, it will not be difficult for another to comprehend that relation, if in setting himself to discover it he brings the very same ideas into comparison. But if, on the contrary, he affixes to his words ideas different from those that were in the mind of him who first advanced the demonstration; it is evident, that as the same ideas are not compared, the same relation cannot subsist, inasmuch that a proposition will be

50  
Self-evident truths the first principles of reasoning.

51  
Definitions a great help to clearness and evidence in knowledge.

rejected

rejected as false, which, had the terms been rightly understood, must have appeared unexceptionably true. A square, for instance, is a figure bounded by four equal right lines, joined together at right angles. Here the nature of the angles makes no less a part of the idea, than the equality of the sides; and many properties demonstrated of the square flow entirely from its being a rectangular figure. If therefore we suppose a man, who has formed a partial notion of a square, comprehending only the equality of its sides, without regard to the angles, reading some demonstration that implies also this latter consideration; it is plain he would reject it as not universally true, inasmuch as it could not be applied where the sides were joined together at unequal angles. For this last figure, answering still to his idea of a square, would be yet found without the property assigned to it in the proposition. But if it comes afterwards to correct his notion, and render his idea complete, he will then readily own the truth and justness of the demonstration.

52  
Mathematicians, by beginning with them, procure a ready reception to the truths they advance.

V. We see therefore, that nothing contributes so much to the improvement and certainty of human knowledge, as the having determinate ideas, and keeping them steady and invariable in all our discourses and reasonings about them. And on this account it is, that mathematicians, as was before observed, always begin by defining their terms, and distinctly unfolding the notions they are intended to express. Hence such as apply themselves to these studies have exactly the same views of things; and, bringing always the very same ideas into comparison, readily discerns the relations between them.

53  
The establishing of principles, the second step in mathematical knowledge.

VI. When they have taken this first step, and made known the ideas whose relations they intend to investigate; their next care is, to lay down some self-evident truths, which may serve as a foundation for their future reasonings. And here indeed they proceed with remarkable circumspection, admitting no principles but what flow immediately from their definitions, and necessarily force themselves upon a mind in any degree attentive to its perceptions. Thus a *circle* is a figure formed by a right line moving round some fixed point in the same plane. The fixed point round which the line is supposed to move, and where one of its extremities terminates, is called the *centre* of the circle. The other extremity, which is conceived to be carried round until it returns to the point whence it first set out, describes a curve running into itself, and termed the *circumference*. All right lines drawn from the centre to the circumference are called *radii*. From these definitions compared, geometers derive this self-evident truth; that the *radii of the same circle are all equal to one another*.

54  
Propositions divided into speculative and practical.

VII. We now observe, that in all propositions we either affirm or deny some property of the idea that constitutes the subject of our judgment, or we maintain that something may be done or effected. The first sort are called *speculative* propositions, as in the example mentioned above, the *radii of the same circle are all equal one to another*. The others are called *practical*, for a reason too obvious to be mentioned; thus, that a *right line may be drawn from one point to another*, is a practical proposition; inasmuch as it expresses that something may be done.

VIII. From this twofold consideration of propositions arises the twofold division of mathematical principles into axioms and postulates. By an axiom they understand any self-evident speculative truth; as, that the whole is greater than its parts: That things equal to one and the same thing are equal to one another. But a self-evident practical proposition is what they call a *postulate*. Such are those of Euclid; that a *finite right line may be continued directly forwards*; that a *circle may be described about any centre with any distance*. And here we are to observe, that as in an axiom the agreement or disagreement between the subject and predicate must come under the immediate inspection of the mind; so in a postulate, not only the possibility of the thing asserted must be evident at first view, but also the manner in which it may be effected. For where this manner is not of itself apparent, the proposition comes under the notion of the demonstrable kind, and is treated as such by geometrical writers. Thus, to draw a right line from one point to another, is assumed by Euclid as a postulate, because the manner of doing it is so obvious, as to require no previous teaching. But then it is not equally evident, how we are to construct an equilateral triangle. For this reason he advances it as a demonstrable proposition, lays down rules for the exact performance, and at the same time proves, that if these rules are followed, the figure will be justly described.

IX. This leads us to take notice, that as self-evident truths are distinguished into different kinds, according as they are speculative or practical; so is it also with demonstrable propositions. A demonstrable speculative proposition is by mathematicians called a *theorem*. Such is the famous 47th proposition of the first book of the elements, known by the name of the *Pythagoric theorem*, in his supposed inventor Pythagoras, viz. "that in every right-angled triangle, the square described upon the side subtending the right-angle is equal to both the squares described upon the sides containing the right-angle." On the other hand, a demonstrable practical proposition is called a *problem*; as where Euclid teaches us to describe a square upon a given right-line.

X. It may not be amiss to add, that, besides the four kinds of propositions already mentioned, mathematicians have also a fifth, known by the name of *corollaries*. These are usually subjoined to theorems or problems, and differ from them only in this; that they flow from what is there demonstrated in so obvious a manner as to discover their dependence upon the proposition whence they are deduced, almost as soon as proposed. Thus Euclid having demonstrated, "that in every right-lined triangle all the three angles taken together are equal to two right-angles;" adds by way of corollary, "that all the three angles of any one triangle taken together are equal to all the three angles of any other triangle taken together;" which is evident at first sight; because in all cases they are equal to two right ones, and things equal to one and the same thing are equal to one another.

The scholia of mathematicians are indifferently annexed to definitions, propositions, or corollaries; and answer the same purposes as annotations upon a classic author.

Hence mathematical principles distinguished into axioms and postulates.

55  
And demonstrable propositions into theorems and problems.

57  
Corollaries are obvious deductions from theorems or problems.

58  
Scholia serve the purposes of annotations, or a comment.



author. For in them occasion is taken to explain whatever may appear intricate and obscure in a train of reasoning; to answer objections; to teach the application and uses of propositions; to lay open the original

and history of the several discoveries made in the science; and in a word, to acquaint us with all such particulars as deserve to be known, whether considered as points of curiosity or profit.

## P A R T III.

### OF REASONING.

#### CHAP. I. *Of Reasoning in general, and the parts of which it consists.*

59  
Remote relations discovered by means of intermediate ideas.

IT often happens in comparing ideas together, that their agreement or disagreement cannot be discerned at first view, especially if they are of such a nature as not to admit of an exact application one to another. When, for instance, we compare two figures of a different make, in order to judge of their equality or inequality, it is plain, that by barely considering the figures themselves, we cannot arrive at an exact determination; because, by reason of their disagreeing forms, it is impossible so to put them together, as that their several parts shall mutually coincide. Here then it becomes necessary to look out for some third idea that will admit of such an application as the present case requires; wherein if we succeed, all difficulties vanish, and the relation we are in quest of may be traced with ease. Thus right-lined figures are all reduced to squares, by means of which we can measure their areas, and determine exactly their agreement or disagreement in point of magnitude.

63  
This manner of arriving at truth termed reasoning.

II. But how can any third idea serve to discover a relation between two others? The answer is, by being compared severally with these others; for such a comparison enables us to see how far the ideas with which this third is compared are connected or disjointed between themselves. In the example mentioned above of two right-lined figures, if we compare each of them with some square whose area is known, and find the one exactly equal to it, and the other less by a square inch, we immediately conclude that the area of the first figure is a square inch greater than that of the second. This manner of determining the relation between any two ideas, by the intervention of some third with which they may be compared, is that which we call *reasoning*; and is indeed the chief instrument by which we push on our discoveries, and enlarge our knowledge. The great art lies in finding out such intermediate ideas, as, when compared with the others in the question, will furnish evident and known truths; because, as will afterwards appear, it is only by means of them that we arrive at the knowledge of what is hidden and remote.

61  
The parts that constitute an act of reasoning and a syllogism.

III. Hence it appears, that every act of reasoning necessarily includes three distinct judgments; two wherein the ideas whose relation we want to discover are severally compared with the middle idea, and a third wherein they are themselves connected or disjointed, according to the result of that comparison. Now as in the second part of logic our judgments, when put into words, were called propositions, so here in the third part the expressions of our reasonings are termed *syllogisms*. And hence it follows,

that as every act of reasoning implies three several judgments, so every syllogism must include three distinct propositions. When a reasoning is thus put into words, and appears in form of a syllogism, the intermediate idea made use of, to discover the agreement or disagreement we search for, is called the *middle term*; and the two ideas themselves, with which this third is compared, go by the name of the *extremes*.

IV. But as these things are best illustrated by examples; let us, for instance, set ourselves to inquire *whether men are accountable for their actions*. As the relation between the ideas of *man* and *accountableness* comes not within the immediate view of the mind, our first care must be to find out some third idea that will enable us the more easily to discover and trace it. A very small measure of reflection is sufficient to inform us, that no creature can be accountable for his actions, unless we suppose him capable of distinguishing the good from the bad; that is, unless we suppose him possessed of reason. Nor is this alone sufficient. For what would it avail him to know good from bad actions, if he had no freedom of choice, nor could avoid the one and pursue the other? hence it becomes necessary to take in both considerations in the present case. It is at the same time equally apparent, that where ever there is this ability of distinguishing good from bad actions, and of pursuing the one and avoiding the other, there also a creature is accountable. We have then got a third idea, with which *accountableness* is inseparably connected, *viz. reason and liberty*; which are here to be considered as making up one complex conception. Let us now take this middle idea, and compare it with the other term in the question, *viz. man*, and we all know by experience that it may be affirmed of him. Having thus by means of the intermediate idea formed two several judgments, *viz. that man is possessed of reason and liberty*; and *that reason and liberty imply accountableness*; a third obviously and necessarily follows, *viz. that man is accountable for his actions*. Here then we have a complete act of reasoning, in which, according to what has been already observed, there are three distinct judgments; two that may be styled previous, inasmuch as they lead to the other, and arise from comparing the middle idea with the two ideas in the question: the third is a consequence of these previous acts, and flows from combining the extreme ideas between themselves. If now we put this reasoning into words, it exhibits what logicians term a syllogism; and, when propounded in due form, runs thus:

“Every creature possessed of reason and liberty is accountable for his actions.

“Man is a creature possessed of reason and liberty;

“Therefore man is accountable for his actions.”

V.

62  
Instance, man and accountable-ness.

63  
Premises,  
conclusion,  
extremes,  
middle  
term.

V. In this syllogism we may observe, that there are three several propositions expressing the three judgments implied in the act of reasoning; and so disposed, as to represent distinctly what passes within the mind in tracing the more distant relations of its ideas. The two first propositions answer the two previous judgments in reasoning, and are called the *premises*, because they are placed before the other. The third is termed the *conclusion*, as being gained in consequence of what was asserted in the premises. We are also to remember, that the terms expressing the two ideas whose relations we inquire after, as here *man* and *accountableness*, are in general called the *extremes*; and that the intermediate idea, by means of which the relation is traced, *viz. a creature possessed of reason and liberty*, takes the name of the *middle term*. Hence it follows, that by the *premises* of a syllogism we are always to understand the two propositions where the middle term is severally compared with the *extremes*; for these constitute the previous judgments, whence the truth we are in quest of is by reasoning deduced. The *conclusion* is that other proposition, in which the *extremes* themselves are joined or separated agreeably to what appears upon the above comparison.

64  
Major and  
minor  
term, ma-  
jor and mi-  
nor propo-  
sition.

VI. The conclusion is made up of the extreme terms of the syllogism: and the extreme, which serves as the predicate of the conclusion, goes by the name of the *major term*: the other extreme, which makes the subject in the same proposition, is called the *minor term*. From this distinction of the extremes arises also a distinction between the premises, where these extremes are severally compared with the middle term. That proposition which compares the greater extreme, or the predicate of the conclusion with the middle term, is called the *major proposition*: the other, wherein the same middle term is compared with the subject of the conclusion or lesser extreme, is called the *minor proposition*. All this is obvious from the syllogism already given, where the conclusion is, *man is accountable for his actions*. For here the predicate *accountable for his actions*, being connected with the middle term in the first of the two premises; *every creature possessed of reason and liberty is accountable for his actions*, gives what we call the *major proposition*. In the second of the premises; *man is a creature possessed of reason and liberty*, we find the lesser extreme, or subject of the conclusion, *viz. man*, connected with the same middle term, whence it is known to be the *minor proposition*. When a syllogism is proposed in due form, the major proposition is always placed first, the minor next, and the conclusion last.

65  
In a single  
act of rea-  
soning the  
premises  
must be in-  
tuitive  
truths.

VII. These things premised, we may in the general define reasoning to be an act or operation of the mind, deducing some unknown proposition from other previous ones that are evident and known. These previous propositions, in a simple act of reasoning, are only two in number; and it is always required that they be of themselves apparent to the understanding, inasmuch that we assent to and perceive the truth of them as soon as proposed. In the syllogism given above, the premises are supposed to be self-evident truths; otherwise the conclusion could not be inferred by a single act of reasoning. If, for instance, in the major, *every creature possessed of reason and liberty is*

*accountable for his actions*, the connection between the subject and predicate could not be perceived by a bare attention to the ideas themselves; it is evident that this proposition would no less require a proof than the conclusion deduced from it. In this case a new middle term must be sought for, to trace the connection here supposed; and this of course furnishes another syllogism, by which having established the proposition in question, we are then, and not before, at liberty to use it in any succeeding train of reasoning. And should it so happen, that in this second essay there was still some previous proposition whose truth did not appear at first sight, we must then have recourse to a third syllogism, in order to lay open that truth to the mind; because so long as the premises remain uncertain, the conclusion built upon them must be so too. When, by conducting our thoughts in this manner, we at last arrive at some syllogism where the previous propositions are intuitive truths; the mind then rests in full security, as perceiving that the several conclusions it has passed through stand upon the immoveable foundation of self-evidence, and when traced to their source terminate in it.

VIII. We see therefore, that in order to infer a conclusion by a single act of reasoning, the premises must be intuitive propositions. Where they are not, previous syllogisms are required; in which case reasoning becomes a complicated act, taking in a variety of successive steps. This frequently happens in tracing the more remote relation of our ideas; where, many middle terms being called in, the conclusion cannot be made out but in consequence of a series of syllogisms following one another in train. But although in this concatenation of propositions, those that form the premises of the last syllogism are often considerably removed from self-evidence; yet if we trace the reasoning backwards, we shall find them the conclusions of previous syllogisms, whose premises approach nearer and nearer to intuition in proportion as we advance, and are found at last to terminate in it. And if, after having thus unravelled a demonstration, we take it the contrary way; and observe how the mind, setting out with intuitive perceptions, couples them together to form a conclusion; how, by introducing this conclusion into another syllogism, it still advances one step farther; and so proceeds, making every new discovery subservient to its future progress; we shall then perceive clearly, that reasoning, in the highest exercise of that faculty, is no more than an orderly combination of those simple acts which we have already so fully explained.

IX. Thus we see, that reasoning beginning with first principles, rises gradually from one judgment to another, and connects them in such manner, that every stage of the progression brings intuitive certainty along with it. And now at length we may clearly understand the definition given above of this distinguishing faculty of the human mind. Reason, we have said, is the ability of deducing unknown truths from principles or propositions that are already known. This evidently appears by the foregoing account, where we see that no proposition is admitted into a syllogism, to serve as one of the previous judgments on which the conclusion rests, unless it is itself a known and esta-

66  
Reasoning,  
in the high-  
est exercise  
of it, only a  
concatenation  
of syl-  
logisms.

67  
Requires  
intuitive  
certainty in  
every step  
of the pro-  
gression.

blished

blished truth, whose connection with self-evident principles has been already traced.

CHAP. II. *Of the several kinds of Reasoning; and first, of that by which we determine the Genera and Species of Things.*

63  
Reasoning  
twofold.

I. ALL the aims of human reason may in the general be reduced to these two: 1. To rank things under those universal ideas to which they truly belong; and, 2. To ascribe to them their several attributes and properties in consequence of that distribution.

69  
The first  
kind re-  
gards the  
genera and  
species of  
things.

II. One great aim of human reason is to determine the genera and species of things. We have seen in the first Part of this treatise, how the mind proceeds in framing general ideas. We have also seen in the second Part, how by means of these general ideas we come by universal propositions. Now as in these universal propositions we affirm some property of a genus or species, it is plain that we cannot apply this property to particular objects till we have first determined whether they are comprehended under that general idea of which the property is affirmed. Thus there are certain properties belonging to all *even* numbers, which nevertheless cannot be applied to any particular number, until we have first discovered it to be of the species expressed by that natural name. Hence reasoning begins with referring things to their several divisions and classes in the scale of our ideas; and as these divisions are all distinguished by particular names, we hereby learn to apply the terms expressing general conceptions to such particular objects as come under our immediate observation.

70  
The steps  
by which  
we arrive  
at conclu-  
sions of this  
sort.

III. Now in order to arrive at these conclusions, by which the several objects of perception are brought under general names, two things are manifestly necessary. First, that we take a view of the idea itself denoted by that general name, and carefully attend to the distinguishing marks which serve to characterize it. Secondly, that we compare this idea with the object under consideration, observing diligently where in they agree or differ. If the idea is found to correspond with the particular object, we then without hesitation apply the general name; but if no such correspondence intervenes, the conclusion must necessarily take a contrary turn. Let us, for instance, take the number *eight*, and consider by what steps we are led to pronounce it an *even* number. First then, we call to mind the idea signified by the expression *an even number*, viz. that it is a number divisible into two equal parts. We then compare this idea with the number *eight*, and, finding them manifestly to agree, see at once the necessity of admitting the conclusion. These several judgments therefore transferred into language, and reduced to the form of a syllogism, appear thus:

“Every number that may be divided into two equal parts is an *even* number.

“The number *eight* may be divided into two equal parts;

“Therefore the number *eight* is an *even* number.”

IV. Here it may be observed, that where the general idea, to which particular objects are referred, is very familiar to the mind, and frequently in view; this reference, and the application of the general name, seem to be made without any apparatus of rea-

71  
Those steps  
always fol-  
lowed, tho’  
in familiar  
cases we do  
not always  
attend to them.

soning. When we see a horse in the fields, or a dog in the street, we readily apply the name of the species; habit, and a familiar acquaintance with the general idea, suggesting it instantaneously to the mind. We are not however to imagine on this account that the understanding departs from the usual rules of just thinking. A frequent repetition of acts begets a habit; and habits are attended with certain promptness of execution, that prevents our observing the several steps and gradations by which any course of action is accomplished. But in other instances, where we judge not by precontracted habits, as when the general idea is very complex, or less familiar to the mind, we always proceed according to the form of reasoning established above. A goldsmith, for instance, who is in doubt as to any piece of metal, whether it be of the species called *gold*, first examines its properties, and then comparing them with the general idea signified by that name, if he finds a perfect correspondence, no longer hesitates under what class of metals to rank it.

V. Nor let it be imagined that our reasonings here, because in appearance bounded to the imposing of general names upon particular objects, are therefore trivial and of little consequence. Some of the most considerable debates among mankind, and such too as nearly regard their lives, interest, and happiness, turn wholly upon this article. Is it not the chief employment of our several courts of judicature to determine in particular instances, what is law, justice, and equity? Of what importance is it in many cases to decide a right whether an action shall be termed *murder* or *manslaughter*? We see then that no less than the lives and fortunes of men depend often upon these decisions. The reason is plain. Actions, when once referred to a general idea, draw after them all that may be affirmed of that idea; inasmuch that the determining the species of actions is all one with determining what proportion of praise or dispraise, commendation or blame, &c. ought to follow them. For as it is allowed that murder deserves death; by bringing any particular action under the head of murder, we of course decide the punishment due to it.

VI. But the great importance of this branch of reasoning, and the necessity of care and circumspection in referring particular objects to general ideas, is still farther evident from the practice of the mathematicians. Every one who has read Euclid knows, that he frequently requires us to draw lines through certain points, and according to such and such directions. The figures thence resulting are often squares, parallelograms, or rectangles. Yet Euclid never supposes this from their bare appearance, but always demonstrates it upon the strictest principles of geometry. Nor is the method he takes in any thing different from that described above. Thus, for instance, having defined a square to be a figure bounded by four equal sides joined together at right angles; when such a figure arises in any construction previous to the demonstration of a proposition, yet he never calls it by that name until he has shewn that its sides are equal, and all its angles right ones. Now this is apparently the same form of reasoning we have before exhibited in proving *eight* to be an even number.

72  
The great  
importance  
of this  
branch of  
reasoning.

73  
And the ex-  
act obser-  
vance of it  
practised by  
mathemati-  
cians.



74  
Fixed and  
invariable  
ideas, with  
a steady ap-  
plication of  
names, ren-  
ders this  
part of  
knowledge  
both easy  
and certain.

VII. Having thus explained the rules by which we are to conduct ourselves in ranking particular objects under general ideas, and shewn their conformity to the practice and manner of the mathematicians; it remains only to observe, that the true way of rendering this part of knowledge both easy and certain, is, by habituating ourselves to clear and determinate ideas, and keeping them steadily annexed to their respective names. For as all our aim is to apply general words aright, if these words stand for invariable ideas that are perfectly known to the mind, and can be readily distinguished upon occasion, there will be little danger of mistake or error in our reasonings. Let us suppose that, by examining any object, and carrying our attention successively from one part to another, we have acquainted ourselves with the several particulars observable in it. If among these we find such as constitute some general idea, framed and settled beforehand by the understanding, and distinguished by a particular name, the resemblance thus known and perceived necessarily determines the species of the object, and thereby gives it a right to the name by which that species is called. Thus four equal sides, joined together at right angles, make up the notion of a *square*. As this is a fixed and invariable idea, without which the general name cannot be applied, we never call any particular figure a *square* until it appears to have these several conditions; and contrarily, wherever a figure is found with these conditions, it necessarily takes the name of a *square*. The same will be found to hold in all our other reasonings of this kind, where nothing can create any difficulty but the want of settled ideas. If, for instance, we have not determined within ourselves the precise notion denoted by the word *manslaughter*, it will be impossible for us to decide whether any particular action ought to bear that name: because, however nicely we examine the action itself, yet, being strangers to the general idea with which it is to be compared, we are utterly unable to judge of their agreement or disagreement. But if we take care to remove this obstacle, and distinctly trace the two ideas under consideration, all difficulties vanish, and the resolution becomes both easy and certain.

VIII. Thus we see of what importance it is towards the improvement and certainty of human knowledge, that we accustom ourselves to clear and determinate ideas, and a steady application of words.

CHAP. III. *Of Reasoning, as it regards the Powers and Properties of Things, and the Relations of our general Ideas.*

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The distinction  
of reason-  
ing, as it  
regards the  
sciences and  
as it concerns  
common life.

I. WE come now to the second great end which men have in view in their reasonings; namely, the discovering and ascribing to things their several attributes and properties. And here it will be necessary to distinguish between reasoning, as it regards the sciences, and as it concerns common life. In the sciences, our reason is employed chiefly about universal truths, it being by them alone that the bounds of human knowledge are enlarged. Hence the division of things into various classes, called otherwise *genera* and *species*. For these universal ideas being set up as the representatives of many particular things, whatever

is affirmed of them may be also affirmed of all the individuals to which they belong. *Murder*, for instance, is a general idea, representing a certain species of human actions. Reason tells us that the punishment due to it is *death*. Hence every particular action, coming under the notion of *murder*, has the punishment of *death* allotted to it. Here then we apply the general truth to some obvious instance; and this is what properly constitutes the reasoning of common life. For men, in their ordinary transactions and intercourse one with another, have, for the most part, to do only with particular objects. Our friends and relations, their characters and behaviour, the constitution of the several bodies that surround us, and the uses to which they may be applied, are what chiefly engage our attention. In all these, we reason about particular things; and the whole result of our reasoning is, the applying the general truths of the sciences in the ordinary transactions of human life. When we see a viper, we avoid it. Wherever we have occasion for the forcible action of water to move a body that makes considerable resistance, we take care to convey it in such a manner that it shall fall upon the object with impetuosity. Now all this happens in consequence of our familiar and ready application of these two general truths. *The bite of a viper is mortal. Water, falling upon a body with impetuosity, acts very forcibly towards setting it in motion.* In like manner, if we set ourselves to consider any particular character, in order to determine the share of praise or dispraise that belongs to it, our great concern is to ascertain exactly the proportion of virtue and vice. The reason is obvious. A just determination, in all cases of this kind, depends entirely upon an application of these general maxims of morality. *Virtuous actions deserve praise. Vicious actions deserve blame.*

II. Hence it appears that reasoning, as it regards common life, is no more than the ascribing the general properties of things to those several objects with which we are more immediately concerned, according as they are found to be of that particular division or class to which the properties belong. The steps then by which we proceed are manifestly these. First, we refer the object under consideration to some general idea or class of things. We then recollect the several attributes of that general idea. And, lastly, ascribe all those attributes to the present object. Thus, in considering the character of *Sempronius*, if we find it to be of the kind called *virtuous*, when we at the same time reflect that a virtuous character is deserving of esteem, it naturally and obviously follows that *Sempronius* is so too. These thoughts put into a *syllogism*, in order to exhibit the form of reasoning here required, run thus:

“Every virtuous man is worthy of esteem.

“*Sempronius* is a virtuous man:

“Therefore *Sempronius* is worthy of esteem.”

III. By this *syllogism* it appears, that before we affirm any thing of a particular object, that object must be referred to some general idea. *Sempronius* is pronounced worthy of esteem only in consequence of his being a virtuous man, or coming under that general notion. Hence we see the necessary connection of the various parts of reasoning, and the dependence

(c) they

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The steps  
by which  
we proceed  
in the reason-  
ing of com-  
mon  
life.

77  
The con-  
nection and  
dependence  
of the two  
grand branches  
of reason-  
ing one upon  
another.

they have one upon another. The determining the genera and species of things is, as we have said, one exercise of human reason; and here we find that this exercise is the first in order, and previous to the other, which consists in ascribing to them their powers, properties, and relations. But when we have taken this previous step, and brought particular objects under general names; as the properties we ascribe to them are no other than those of the general idea, it is plain that, in order to a successful progress in this part of knowledge, we must thoroughly acquaint ourselves with the several relations and attributes of these our general ideas. When this is done, the other part will be easy, and requires scarce any labour or thought, as being no more than an application of the general form of reasoning represented in the foregoing syllogism. Now as we have already sufficiently shown how we are to proceed in determining the genera and species of things, which, as we have said, is the previous step to this second branch of human knowledge; all that is farther wanting towards a due explanation of it is, to offer some considerations as to the manner of investigating the general relations of our ideas. This is the highest exercise of the powers of the understanding, and that by means whereof we arrive at the discovery of universal truths; inasmuch that our deductions in this way constitute that particular species of reasoning which we have before said regards principally the sciences.

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Two things required to make a good reasoner.

IV. But that we may conduct our thoughts with some order and method, we shall begin with observing, that the relations of our general ideas are of two kinds: either such as immediately discover themselves, upon comparing the ideas one with another; or such as, being more remote and distant, require art and contrivance to bring them into view. The relations of the first kind furnish us with intuitive and self-evident truths: those of the second are traced by reasoning, and a due application of intermediate ideas. It is of this last kind that we are to speak here, having dispatched what was necessary with regard to the other in the second Part. As, therefore, in tracing the more distant relations of things, we must always have recourse to intervening ideas, and are more or less successful in our researches according to our acquaintance with these ideas, and ability of applying them; it is evident that, to make a good reasoner, two things are principally required. *First*, An extensive knowledge of those intermediate ideas, by means of which things may be compared one with another. *Secondly*, The skill and talent of applying them happily in all particular instances that come under consideration.

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First, an extensive knowledge of intermediate ideas.

V. In order to our successful progress in reasoning, we must have an extensive knowledge of those intermediate ideas by means of which things may be compared one with another. For as it is not every idea that will answer the purpose of our inquiries, but such only as are peculiarly related to the objects about which we reason, so as, by a comparison with them, to furnish evident and known truths; nothing is more apparent than that the greater variety of conceptions we can call into view, the more likely we are to find some among them that will help us to the truths here

required. And, indeed, it is found to hold in experience, that in proportion as we enlarge our views of things, and grow acquainted with a multitude of different objects, the reasoning faculty gathers strength: for, by extending our sphere of knowledge, the mind acquires a certain force and penetration, as being accustomed to examine the several appearances of its ideas, and observe what light they cast one upon another.

VI. This is the reason why, in order to excel remarkably in any one branch of learning, it is necessary to have at least a general acquaintance with the whole circle of arts and sciences. The truth of it is, all the various divisions of human knowledge are very nearly related among themselves, and, in innumerable instances, serve to illustrate and set off each other. And although it is not to be denied that, by an oblique application to one branch of study, a man may make considerable progress, and acquire some degree of eminence in it; yet his views will be always narrow and contracted, and he will want that masterly discernment which not only enables us to pursue our discoveries with ease, but also, in laying them open to others, to spread a certain brightness around them. But when our reasoning regards a particular science, it is farther necessary that we more nearly acquaint ourselves with whatever relates to that science. A general knowledge is a good preparation, and enables us to proceed with ease and expedition in whatever branch of learning we apply to. But then, in the minute and intricate questions of any science, we are by no means qualified to reason with advantage until we have perfectly mastered the science to which they belong.

VII. We come now to the second thing required, in order to a successful progress in reasoning; namely, the skill and talent of applying intermediate ideas happily in all particular instances that come under consideration. And here, rules and precepts are of little service. Use and experience are the best instructors. For, whatever logicians may boast of being able to form perfect reasoners by book and rule, we find by experience, that the study of their precepts does not always add any great degree of strength to the understanding. In short, it is the habit alone of reasoning that makes a reasoner. And therefore the true way to acquire this talent is, by being much conversant in those sciences where the art of reasoning is allowed to reign in the greatest perfection. Hence it was that the ancients, who so well understood the manner of forming the mind, always began with *mathematics*, as the foundation of their philosophical studies. Here the understanding is by degrees habituated to truth, contracts insensibly a certain fondness for it, and learns never to yield its assent to any proposition, but where the evidence is sufficient to produce full conviction. For this reason *Plato* has called mathematical demonstrations the *cathartici* or purgatives of the soul, as being the proper means to cleanse it from error, and restore that natural exercise of its faculties in which just thinking consists.

VIII. If therefore we would form our minds to a habit of reasoning closely and in train, we cannot take

80  
To excel in any one branch of learning, we must be in general acquainted with the whole circle of arts and sciences.

81  
Secondly, the skill of applying intermediate ideas happily in particular instances.

82  
The study of mathematical demonstrations of great avail in this respect.

83  
As also of such authors on other subjects, as are distinguished for strength and justice of reasoning.

take any more certain method, than the exercising ourselves in mathematical demonstrations, so as to contract a kind of familiarity with them. Not that we look upon it as necessary that all men should be deep mathematicians; but that, having got the way of reasoning which that study necessarily brings the mind to, they may be able to transfer it to other parts of knowledge, as they shall have occasion.

IX. But although the study of mathematics be of all others the most useful, to form the mind, and give it an early relish of truth, yet ought not other parts of philosophy to be neglected. For there also we meet with many opportunities of exercising the powers of the understanding; and the variety of subjects naturally leads us to observe all those different turns of thinking that are peculiarly adapted to the several ideas we examine, and the truth we search after. A mind thus trained acquires a certain mastery over its own thoughts, inasmuch that it can range and model them at pleasure, and call such into view as best suit its present designs. Now in this the whole art of reasoning consists; from among a great variety of different ideas to single out those that are most proper for the business in hand, and to lay them together in such order, that from plain and easy beginnings, by gentle degrees, and a continued train of evident truths, we may be insensibly led on to such discoveries, as at our first setting out appeared beyond the reach of human understanding. For this purpose, besides the study of mathematics before recommended, we ought to apply ourselves diligently to the reading of such authors as have distinguished themselves for strength of reasoning, and a just and accurate manner of thinking. For it is observable, that a mind exercised and seasoned to truth, seldom rests satisfied in a bare contemplation of the arguments offered by others; but will be frequently assaying its own strength, and pursuing its discoveries upon the plan it is most accustomed to. Thus we insensibly contract a habit of tracing truth from one stage to another, and of investigating those general relations and properties which we afterwards ascribe to particular things, according as we find them comprehended under the abstract ideas to which the properties belong.

#### CHAP. IV. *Of the Forms of Syllogisms.*

84  
The figures of syllogisms.

I. HITHERTO we have contented ourselves with a general notion of syllogisms, and of the parts of which they consist. It is now time to enter a little more particularly into the subject, to examine their various forms, and lay open the rules of argumentation proper to each. In the syllogisms mentioned in the foregoing chapters, we may observe, that the *middle term* is the subject of the *major* proposition, and the predicate of the *minor*. This disposition, though the most natural and obvious, is not however necessary; it frequently happening, that the middle term is the subject in both the premises, or the predicate in both; and sometimes, directly contrary to its disposition in the foregoing chapters, the predicate in the major, and the subject in the minor. Hence the distinction of syllogisms into various kinds, called *figures* by logicians. For figure, according to their use of the word, is nothing else but the order and disposition of the

middle term in any syllogism. And as this disposition is, we see, fourfold, so the figures of syllogisms thence arising are four in number. When the middle term is the subject of the major proposition, and the predicate of the minor, we have what is called the *first figure*. If, on the other hand, it is the predicate of both the premises, the syllogism is said to be the *second figure*. Again, in the *third figure*, the middle term is the subject of the two premises. And lastly, by making it the predicate of the major, and subject of the minor, we obtain syllogisms in the *fourth figure*.

II. But, besides this fourfold distinction of syllogisms, there is also a farther subdivision of them in every figure, arising from the *quantity* and *quality*, as they are called, of the propositions. By quantity we mean the consideration of propositions, as universal or particular; by quality, as affirmative or negative.

Now as, in all the several dispositions of the middle term, the propositions of which a syllogism consists may be either universal or particular, affirmative or negative; the due determination of these, and so putting them together as the laws of argumentation require, constitute what logicians call the *moods* of syllogisms. Of these moods there is a determinate number to every figure, including all the possible ways in which propositions differing in quantity or quality can be combined, according to any disposition of the middle term, in order to arrive at a just conclusion.

III. The division of syllogisms according to mood and figure respects those especially which are known by the name of plain simple syllogisms; that is, which are bounded to three propositions, all simple, and where the extremes and middle term are connected, according to the rules laid down above. But as the mind is not tied down to any one precise form of reasoning, but sometimes makes use of more, sometimes of fewer premises, and often takes in compound and conditional propositions, it may not be amiss to take notice of the different forms derived from this source, and explain the rules by which the mind conducts itself in the use of them.

IV. When in any syllogism the major is a conditional proposition, the syllogism itself is termed *conditional*. Thus:

"If there is a God, he ought to be worshipped.

"But there is a God:

"Therefore he ought to be worshipped."

In this example, the major, or first proposition, is, we see, conditional, and therefore the syllogism itself is also of the kind called by that name. And here we are to observe, that all conditional propositions are made of two distinct parts: one expressing the condition upon which the predicate agrees or disagrees with the subject, as in this now before us, *if there is a God*; the other joining or disjoining the said predicate and subject, as here, *he ought to be worshipped*. The first of these parts, or that which implies the condition, is called the *antecedent*; the second, where we join or disjoin the predicate and subject, has the name of the *consequent*.

V. In all propositions of this kind, supposing them to be exact in point of form, the relation between the antecedent and consequent must ever be true and real; that is, the antecedent must always contain some cer-

85  
The moods of syllogisms.

86  
Foundation of the other division of syllogisms.

87  
Conditional syllogisms.

88  
Ground of illation in conditional syllogisms.



tain and genuine condition, which necessarily implies the consequent; for otherwise the proposition itself will be false, and therefore ought not to be admitted into our reasonings. Hence it follows, that when any conditional proposition is affirmed, if we admit the antecedent of that proposition, we must at the same time necessarily admit the consequent, but if we reject the consequent, we are in like manner bound to reject the antecedent. For as the antecedent always expresses some condition which necessarily implies the truth of the consequent; by admitting the antecedent, we allow of that condition, and therefore ought also to admit the consequent. In like manner, if it appears that the consequent ought to be rejected, the antecedent evidently must be so too; because, as was just now demonstrated, the admitting of the antecedent would necessarily imply the admission also of the consequent.

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The two  
moods of  
conditional  
syllogisms.

VI. There are two ways of arguing in *hypothetical* syllogisms, which lead to a certain and unavoidable conclusion. For as the major is always a conditional proposition, consisting of an antecedent and a consequent; if the minor admits the antecedent, it is plain that the conclusion must admit the consequent. This is called arguing from the admission of the antecedent to the admission of the consequent, and constitutes that mood or species of hypothetical syllogisms which is distinguished in the schools by the name of the *modus ponens*, inasmuch as by it the whole conditional proposition, both antecedent and consequent, is established. Thus:

“If God is infinitely wise, and acts with perfect freedom, he does nothing but what is best.”

“But God is infinitely wise, and acts with perfect freedom:

“Therefore he does nothing but what is best.”

Here we see the antecedent or first part of the conditional proposition is established in the minor, and the consequent or second part in the conclusion; whence the syllogism itself is an example of the *modus ponens*. But if now we on the contrary suppose that the minor rejects the consequent, then it is apparent that the conclusion must also reject the antecedent. In this case we are said to argue from the removal of the consequent to the removal of the antecedent, and the particular mood or species of syllogisms thence arising is called by logicians the *modus tollens*; because in it both antecedent and consequent are rejected or taken away, as appears by the following example.

“If God were not a Being of infinite goodness, neither would he consult the happiness of his creatures.

“But God does consult the happiness of his creatures:

“Therefore he is a Being of infinite goodness.”

VII. These two species take in the whole class of conditional syllogisms, and include all the possible ways of arguing that lead to a legitimate conclusion; because we cannot here proceed by a contrary process of reasoning, that is, from the removal of the antecedent to the removal of the consequent, or from the establishing of the consequent to the establishing of the antecedent. For although the antecedent always expresses some real condition, which, once admitted, necessarily implies the consequent, yet it does not follow that there is therefore no other condition; and if

so, then, after removing the antecedent, the consequent may still hold, because of some other determination that enters it. When we say, *If a stone is exposed some time to the rays of the Sun, it will contract a certain degree of heat*; the proposition is certainly true; and, admitting the antecedent, we must also admit the consequent. But as there are other ways by which a stone may gather heat, it will not follow, from the ceasing of the before-mentioned condition, that therefore the consequent cannot take place. In other words, we cannot argue: *But the stone has not been exposed to the rays of the sun; therefore neither has it any degree of heat*: Inasmuch as there are a great many other ways by which heat might have been communicated to it. And if we cannot argue from the removal of the antecedent to the removal of the consequent, no more can we from the admission of the consequent to the admission of the antecedent: because, as the consequent may flow from a great variety of different suppositions, the allowing of it does not determine the precise supposition, but only that some one of them must take place. Thus in the foregoing proposition, *If a stone is exposed sometime to the rays of the sun, it will contract a certain degree of heat*: admitting the consequent, viz. *that it has contracted a certain degree of heat*, we are not therefore bound to admit the antecedent, *that it has been sometime exposed to the rays of the sun*; because there are many other causes whence that heat may have proceeded. These two ways of arguing, therefore, hold not in conditional syllogisms.

VIII. As from the major's being a conditional proposition, we obtain the species of conditional syllogisms; so where it is a disjunctive proposition, the syllogism to which it belongs, is also called *disjunctive*, as in the following example: 90  
The manner of arguing in disjunctive syllogisms.

“The world is either self-existent, or the work of some finite, or of some infinite Being.

“But it is not self-existent, nor the work of a finite being:

“Therefore it is the work of an infinite Being.”

Now a disjunctive proposition is that, where of several predicates, we affirm one necessarily to belong to the subject, to the exclusion of all the rest, but leave that particular one undetermined. Hence it follows, that as soon as we determine the particular predicate, all the rest are of course to be rejected; or if we reject all the predicates but one, that one necessarily takes place. When, therefore, in a disjunctive syllogism, the several predicates are enumerated in the major; if the minor establishes any one of these predicates, the conclusion ought to remove all the rest; or if, in the minor, all the predicates but one are removed, the conclusion must necessarily establish that one. Thus, in the disjunctive syllogism given above, the major affirms one of the three predicates to belong to the earth, viz. *self-existence*, or that it is *the work of a finite*, or that it is *the work of an infinite Being*. Two of these predicates are removed in the minor, viz. *self-existence*, and *the work of a finite being*. Hence the conclusion necessarily ascribes to it the third predicate, and affirms that it is *the work of an infinite Being*. If now we give the syllogism another turn, inasmuch that the minor may establish one of the predicates,

90  
They include all the legitimate ways of arguing.

predicates, by affirming the earth to be the production of an infinite Being; then the conclusion must remove the other two, asserting it to be neither *self-existent*, nor the *work of a finite being*. These are the forms of reasoning in these species of syllogisms, the justness of which appears at first sight; and that there can be no other, is evident from the very nature of a disjunctive proposition.

92  
Imperfect or mutilated syllogisms.

IX. In the several kinds of syllogisms hitherto mentioned, we may observe, that the parts are complete; that is, the three propositions of which they consist are represented in form. But it often happens, that some one of the premises is not only an evident truth, but also familiar and in the minds of all men; in which case it is usually omitted, whereby we have an imperfect syllogism, that seems to be made up of only two propositions. Should we, for instance, argue in this manner:

"Every man is mortal:

"Therefore every king is mortal."

The syllogism appears to be imperfect, as consisting but of two propositions. Yet it is really complete; only the minor [*every king is a man*] is omitted, and left to the reader to supply, as being a proposition so familiar and evident that it cannot escape him.

93  
Enthymemes.

X. These seemingly imperfect syllogisms are called *enthymemes*, and occur very frequently in reasoning, especially where it makes a part of common conversation. Nay, there is a particular elegance in them, because, not displaying the argument in all its parts, they leave somewhat to the exercise and invention of the mind. By this means we are put upon exerting ourselves, and seem to share in the discovery of what is proposed to us. Now this is the great secret of fine writing, so to frame and put together our thoughts, as to give full play to the reader's imagination, and draw him insensibly into our very views and course of reasoning. This gives a pleasure not unlike to that which the author himself feels in composing. It besides shortens discourse, and adds a certain force and liveliness to our arguments, when the words in which they are conveyed favour the natural quickness of the mind in its operations, and a single expression is left to exhibit a whole train of thoughts.

94  
Ground of reasoning in immediate consequences.

XI. But there is another species of reasoning with two propositions, which seems to be complete in itself, and where we admit the conclusion without supposing any tacit or suppressed judgment in the mind, from which it follows syllogistically. This happens between propositions, where the connection is such, that the admission of the one necessarily and at the first sight implies the admission also of the other. For if it so falls out, that the proposition on which the other depends is self-evident, we content ourselves with barely affirming it, and infer that other by a direct conclusion. Thus, by admitting an universal proposition, we are forced also to admit of all the particular propositions comprehended under it, this being the very condition that constitutes a proposition universal. If then that universal proposition chances to be self-evident, the particular ones follow of course, without any farther train of reasoning. Whoever allows, for instance, that *things equal to one and the same thing are equal to one another*, must at the same time allow, that two

triangles, each equal to a square whose side is three inches, are also equal between themselves. This argument therefore,

"Things equal to one and the same thing, are equal to one another:

"Therefore these two triangles, each equal to the square of a line of three inches, are equal between themselves."

is complete in its kind, and contains all that is necessary towards a just and legitimate conclusion. For the first or universal proposition is self-evident, and therefore requires no farther proof. And as the truth of the particular is inseparably connected with that of the universal, it follows from it by an obvious and unavoidable consequence.

95  
All reducible to syllogisms of some one form or other.

XII. Now in all cases of this kind, where propositions are deduced one from another, on account of a known and evident connection, we are said to reason by immediate consequence. Such a coherence of propositions manifest at first sight, and forcing itself upon the mind, frequently occurs in reasoning. Logicians have explained at some length the several suppositions upon which it takes place, and allow of all immediate consequences that follow in conformity to them. It is however observable, that these arguments, though seemingly complete, because the conclusion follows necessarily from the single proposition that goes before, may yet be considered as real enthymemes, whose major, which is a conditional proposition, is wanting. The syllogism but just mentioned, when represented according to this view, will run as follows:

"If things equal to one and the same thing, are equal to one another; these two triangles, each equal to a square whose side is three inches, are also equal between themselves.

"But things equal to one and the same thing, are equal to one another:

"Therefore also these triangles, &c. are equal between themselves."

This observation will be found to hold in all immediate consequences whatsoever, inasmuch that they are in fact no more than enthymemes of hypothetical syllogisms. But then it is particular to them, that the ground on which the conclusion rests, namely its coherence with the minor, is of itself apparent, and seen immediately to flow from the rules and reasons of logic.

XIII. The next species of reasoning we shall take notice of here is what is commonly known by the name plain simple of a *sortes*. This is a way of arguing, in which a great number of propositions are so linked together, that the predicate of one becomes continually the subject of the next following, until at last a conclusion is formed, by bringing together the subject of the first proposition, and the predicate of the last. Of this kind is the following argument.

"God is omnipotent.

"An omnipotent being can do every thing possible.

"He that can do every thing possible, can do whatever involves not a contradiction.

"Therefore God can do whatever involves not a contradiction."

This particular combination of propositions may be continued to any length we please, without in the least weakening

weakening the ground upon which the conclusion rests. The reason is, because the *fortes* itself may be resolved into as many simple syllogisms as there are middle terms in it; where this is found universally to hold, that when such a resolution is made, and the syllogisms are placed in train, the conclusion of the last in the series is also the conclusion of the *fortes*. This kind of argument, therefore, as it serves to unite several syllogisms into one, must stand upon the same foundation with the syllogisms of which it consists, and is indeed, properly speaking, no other than a compendious way of reasoning syllogistically.

97  
A *fortes* of  
hypotheti-  
cal syllo-  
gisms.

XIV. What is here said of plain simple propositions may be as well applied to those that are conditional; that is, any number of them may be so joined together in a series, that the consequent of one shall become continually the antecedent of the next following; in which case, by establishing the antecedent of the first proposition, we establish the consequent of the last, or by removing the last consequent remove also the first antecedent. This way of reasoning is exemplified in the following argument.

"If we love any person, all emotions of hatred towards him cease.

"If all emotions of hatred towards a person cease, we cannot rejoice in his misfortunes.

"We rejoice not in his misfortunes, we certainly wish him no injury :

"Therefore, if we love a person, we wish him no injury."

It is evident that this *fortes*, as well as the last, may be resolved into a series of distinct syllogisms, with this only difference, that here the syllogisms are all conditional.

98  
The ground  
of reason-  
ing by in-  
duction.

XV. We come now to that kind of argument which logicians call *induction*; in order to the right understanding of which, it will be necessary to observe, that our general ideas are for the most part capable of various subdivisions. Thus the idea of the lowest species may be subdivided into its several individuals, the idea of any genus into the different species it comprehends, and so of the rest. If then we suppose this distribution to be duly made, and so as to take in the whole extent of the idea to which it belongs; then it is plain that all the subdivisions or parts of any idea taken together constitute that whole idea. Thus the several individuals of any species taken together constitute the whole species, and all the various species comprehended under any genus make up the whole genus. This being allowed, it is apparent, that whatever may be affirmed of all the several subdivisions and classes of any idea ought to be affirmed of the whole general idea to which these subdivisions belong. What may be affirmed of all the individuals of any species may be affirmed of the whole species; and what may be affirmed of all the species of any genus may be also affirmed of the whole genus; because all the individuals taken together are the same with the species, and all the species taken together the same with the genus.

99  
The form  
and struc-  
ture of an  
argument  
by induc-  
tion.

XVI. This way of arguing, where we infer universally concerning any idea what we had before affirmed or denied separately of all its several subdivisions and parts, is called reasoning by induction. Thus

if we suppose the whole tribe of animals subdivided into men, beasts, birds, insects, and fishes, and then reason concerning them after this manner: "all men have a power of beginning motion; all beasts, birds, and insects, have a power of beginning motion; all fishes have a power of beginning motion; therefore all animals have a power of beginning motion." The argument is an induction. When the subdivisions are just, so as to take in the whole general idea, and the enumeration is perfect, that is, extends to all and every of the inferior classes or parts; then the induction is complete, and the manner of reasoning by induction is apparently conclusive.

100  
The ground  
of argu-  
mentation  
in a dilem-  
ma.

XVII. The last species of syllogism we shall take notice of in this chapter is that commonly distinguished by the name of a *dilemma*. A dilemma is an argument by which we endeavour to prove the absurdity or falsehood of some assertion. In order to this, we assume a conditional proposition, the antecedent of which is the assertion to be disproved, and the consequent a disjunctive proposition, enumerating all the possible suppositions upon which that assertion can take place. If then it appears, that all these several suppositions ought to be rejected, it is plain, that the antecedent or assertion itself must be so too. When therefore such a proposition as that before mentioned is made the major of any syllogism; if the minor rejects all the suppositions contained in the consequent, it follows necessarily, that the conclusion ought to reject the antecedent, which, as we have said, is the very assertion to be disproved. This particular way of arguing is that which logicians call a *dilemma*; and from the account here given of it, it appears that we may in the general define it to be a hypothetical syllogism, where the consequent of the major is a disjunctive proposition, which is wholly taken away or removed in the minor. Of this kind is the following:

"If God did not create the world perfect in its kind, it must either proceed from want of in-

"clination, or from want of power.

"But it could not proceed either from want of in-

"clination, or from want of power.

"Therefore he created the world perfect in its kind." Or, which is the same thing: "It is

"absurd to say that he did not create the world perfect in its kind."

101  
An univer-  
sal descrip-  
tion of it.

XVIII. The nature then of a dilemma is universally this. The major is a conditional proposition, whose consequent contains all the several suppositions upon which the antecedent can take place. As therefore these suppositions are wholly removed in the minor, it is evident that the antecedent must be so too; inasmuch that we here always argue from the removal of the consequent to the removal of the antecedent. That is, a dilemma is an argument in the *modus tollens* of hypothetical syllogisms, as logicians love to speak. Hence it is plain, that if the antecedent of the major is an affirmative proposition, the conclusion of the dilemma will be negative; but if it is a negative proposition, the conclusion will be affirmative.

#### CHAP. V. Of Demonstration.

I. HAVING dispatched what seemed necessary to be said with regard to the forms of syllogisms, we now proceed



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Of reasoning  
by a  
concatenation  
of syllogisms.

proceed to explain their use and application in reasoning. We have seen, that in all the different appearances they put on, we still arrive at a just and legitimate conclusion: now it often happens, that the conclusion of one syllogism becomes a previous proposition in another; by which means great numbers of them are sometimes linked together in a series, and truths are made to follow one another in train. And as in such a concatenation of syllogisms all the various ways of reasoning that are truly conclusive may be with safety introduced; hence it is plain, that in deducing any truth from its first principles, especially where it lies at a considerable distance from them, we are at liberty to combine all the several kinds of arguments above explained, according as they are found best to suit the end and purpose of our inquiries. When a proposition is thus by means of syllogisms collected from others more evident and known, it is said to be *proved*: so that we may in the general define the proof of a proposition to be a syllogism, or series of syllogisms, collecting that proposition from known and evident truths. But more particularly, if the syllogisms of which the proofs consist admit of no premises but definitions, self-evident truths, and propositions already established, then is the argument so constituted called a *demonstration*; whereby it appears that demonstrations are ultimately founded on definitions and self-evident propositions.

103  
All syllogisms whatsoever reducible to the first figure.

II. All syllogisms whatsoever, whether compound, multimorph, or defective, are reducible to plain simple syllogisms in some one of the four figures. But this is not all. Syllogisms of the first figure, in particular, admit of all possible conclusions: that is, any propositions whatsoever, whether an universal affirmative or universal negative, a particular affirmative or particular negative, which fourfold division embraces all their varieties; any one of these may be inferred by virtue of some syllogism in the first figure. By this means it happens that the syllogisms of all the other figures are reducible also to syllogisms of the first figure, and may be considered as standing on the same foundation with them. We cannot here demonstrate and explain the manner of this reduction, because it would too much swell the bulk of this treatise. It is enough to take notice that the thing is universally known and allowed among logicians, to whose writings we refer such as desire farther satisfaction in this matter. This then being laid down, it is plain that any demonstration whatsoever may be considered as composed of a series of syllogisms, all in the first figure. For, since all the syllogisms that enter the demonstration are reducible to syllogisms of some one of the four figures; and since the syllogisms of all the other figures are farther reducible to syllogisms of the first figure, it is evident, that the whole demonstration may be resolved into a series of these last syllogisms. Let us now, if possible, discover the ground upon which the conclusion rests in syllogisms of the first figure; because, by so doing, we shall come at an universal principle of certainty, whence the evidence of all demonstrations in all their parts may be ultimately derived.

III. The rules then of the first figure are briefly these. The middle term is the subject of the major

proposition, and the predicate of the minor. The major is always an universal proposition, and the minor always affirmative. Let us now see what effect these rules will have in reasoning. The major is an universal proposition, of which the middle term is the subject, and the predicate of the conclusion the predicate. Hence it appears, that in the major the predicate of the conclusion is always affirmed or denied universally of the middle term. Again, the minor is an affirmative proposition, whereof the subject of the conclusion is the subject, and the middle term the predicate. Here then the middle term is affirmed of the subject of the conclusion; that is, the subject of the conclusion is affirmed to be comprehended under, or to make a part of, the middle term. Thus then we see what is done in the premises of a syllogism of the first figure. The predicate of the conclusion is universally affirmed or denied of some idea. The subject of the conclusion is affirmed to be or to make a part of that idea. Hence it naturally and unavoidably follows, that the predicate of the conclusion ought to be affirmed or denied of the subject. To illustrate this by an example, we shall resume one of the syllogisms of the first chapter.

“Every creature possessed of reason and liberty is accountable for his actions.”

“Man is a creature possessed of reason and liberty: Therefore man is accountable for his actions.”

Here, in the first proposition, the predicate of the conclusion *accountable* is affirmed of all creatures that have reason and liberty. Again, in the second proposition, *man*, the subject of the conclusion, is affirmed to be or to make a part of this class of creatures. Hence the conclusion necessarily and unavoidably follows, *viz.* that man is accountable for his actions; because, if reason and liberty be that which constitutes a creature accountable, and man has reason and liberty, it is plain he has that which constitutes him accountable. In like manner, where the major is a negative proposition, or denies the predicate of the conclusion universally of the middle term, as the minor always asserts the subject of the conclusion, to be or make a part of that middle term, it is no less evident that the predicate of the conclusion ought in this case to be denied of the subject. So that the ground of reasoning, in all syllogisms of the first figure, is manifestly this: “Whatever may be affirmed universally of any idea, may be affirmed of every or “any number of particulars comprehended under that “idea.” And again: “Whatever may be denied “universally of any idea, may be in like manner denied of every or any number of its individuals.” These two propositions are called by logicians the *dictum de omni*, and *dictum de nullo*; and are indeed the great principles of syllogistic reasoning, inasmuch as all conclusions whatsoever either rest immediately upon them, or upon propositions deduced from them. But what adds greatly to their value is, that they are really self-evident truths, and such as we cannot gain say without running into an express contradiction. To affirm, for instance, that *no man is perfect*, and yet argue that *some men are perfect*; or to say that *all men are mortal*, and yet that *some men are not mortal*, is to assert a thing to be and not to be at the same time.

IV. And

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The ground  
of reasoning  
in the  
first figure.

105  
Demonstration, an infallible guide to truth and certainty.

IV. And now we may affirm, that, in all syllogisms of the first figure, if the premises are true, the conclusion must needs be true. If it be true that the predicate of the conclusion, whether affirmative or negative, agrees universally to some idea; and if it be also true that the subject of the conclusion is a part of or comprehended under that idea; then it necessarily follows, that the predicate of the conclusion agrees also to the subject. For to assert the contrary, would be to run counter to some one of the two principles before established; that is, it would be to maintain an evident contradiction. And thus we are come at last to the point we have been all along endeavouring to establish; namely, that every proposition which can be demonstrated is necessarily true. For as every demonstration may be resolved into a series of syllogisms all in the first figure; and as in any one of these syllogisms, if the premises are true, the conclusion must needs be so too; it evidently follows, that if all the several premises are true, all the several conclusions are so, and consequently the conclusion also of the last syllogism, which is always the proposition to be demonstrated. Now that all the premises of a demonstration are true, will easily appear from the very nature and definition of that form of reasoning. A demonstration, as we have said, is a series of syllogisms, all whose premises are either definitions, self-evident truths, or propositions already established. Definitions are identical propositions, wherein we connect the description of an idea with the name by which we chuse to have that idea called, and therefore as to their truth there can be no dispute. Self-evident propositions appear true of themselves, and leave no doubt or uncertainty in the mind. Propositions, before established, are no other than conclusions gained by one or more steps from definitions and self-evident principles; that is, from true premises, and therefore must needs be true. Whence all the previous propositions of a demonstration being, we see, manifestly true; the last conclusion, or proposition to be demonstrated, must be so too. So that demonstration not only leads to certain truth, but we have here also a clear view of the ground and foundation of that certainty. For as, in demonstrating, we may be said to do nothing more than combine a series of syllogisms together, all resting on the same bottom; it is plain that one uniform ground of certainty runs through the whole, and that the conclusions are every where built upon some one of the two principles before established, as the foundation of all our reasoning. These two principles are easily reduced into one, and may be expressed thus: "Whatever predicate, whether affirmative or negative, agrees universally to any idea; the same must needs agree to every or any number of individuals comprehended under that idea." And thus at length we have, according to our first design, reduced the certainty of demonstration to one simple and universal principle; which carries its own evidence along with it, and which is indeed the ultimate foundation of all syllogistic reasoning.

106  
The rules of logic furnish a sufficient criterion for the distinguishing between truth and falsehood.

V. Demonstration therefore serving as an infallible guide to truth, and standing on so sure and unalterable a basis, we may now venture to assert, that the rules of logic furnish a sufficient criterion for the di-

stinguishing between truth and falsehood. For since every proposition that can be demonstrated is necessarily true, he is able to distinguish truth from falsehood who can with certainty judge when a proposition is truly demonstrated. Now a demonstration is, as we have said, nothing more than a concatenation of syllogisms, all whose premises are definitions, self-evident truths, or propositions previously established. To judge therefore of the validity of a demonstration, we must be able to distinguish whether the definitions that enter it are genuine, and truly descriptive of the ideas they are meant to exhibit: whether the propositions assumed without proofs as intuitive truths have really that self-evidence to which they lay claim: whether the syllogisms are drawn up in due form, and agreeable to the laws of argumentation: in fine, whether they are combined together in a just and orderly manner, so that no demonstrable propositions serve any where as premises unless they are conclusions of previous syllogisms. Now it is the business of logic, in explaining the several operations of the mind, fully to instruct us in all these points. It teaches the nature and end of definitions, and lays down the rules by which they ought to be framed. It unfolds the several species of propositions, and distinguishes the self-evident from the demonstrable. It delineates also the different forms of syllogisms, and explains the laws of argumentation proper to each. In fine, it describes the manner of combining syllogisms, so as that they may form a train of reasoning, and lead to the successive discovery of truth. The precepts of logic therefore, as they enable us to judge with certainty when a proposition is duly demonstrated, furnish a sure criterion for the distinguishing between truth and falsehood.

VI. Perhaps it may be objected, that demonstration is a thing very rare and uncommon, as being the prerogative of but a few sciences, and therefore the criterion here given can be of no great use. But wherever, by the bare contemplation of our ideas, truth is discoverable, there also demonstration may be attained. Now that is an abundantly sufficient criterion which enables us to judge with certainty in all cases where the knowledge of truth comes within our reach; for with discoveries, that lie beyond the limits of the human mind, we have, properly, no business or concernment. When a proposition is demonstrated, we are certain of its truth. When, on the contrary, our ideas are such as have no visible connection or repugnance, and therefore furnish not the proper means of tracing their agreement or disagreement, there we are sure that scientific knowledge is not attainable. But where there is some foundation of reasoning, which yet amounts not to the full evidence of demonstration, there the precepts of logic, by teaching us to determine aright of the degree of proof, and of what is still wanting to render it full and complete, enable us to make a due estimate of the measures of probability, and to proportion our assent to the grounds on which the proposition stands. And this is all we can possibly arrive at, or even so much as hope for, in the exercise of faculties so imperfect and limited as ours.

VII. Before we conclude this chapter, it may not be improper to take notice of the distinction of it into direct and indirect.

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And extending to all cases where a certain knowledge of truth is attainable.

108  
The distinction of demonstration into direct and indirect.

rest

*rect* and *indirect*. A *direct demonstration* is, when, beginning with definitions, self-evident propositions, or known and allowed truths, we form a train of syllogisms, and combine them in an orderly manner, continuing the series through a variety of successive steps, until at last we arrive at a syllogism whose conclusion is the proposition to be demonstrated. Proofs of this kind leave no doubt or uncertainty behind them; because, all the several premises being true, the conclusions must be so too, and of course the very last conclusion or proposition to be proved. The other species of demonstration is the *indirect*, or, as it is sometimes called, the *apagogical*. The manner of proceeding here is, by assuming a proposition which directly contradicts that we mean to demonstrate; and thence, by a continued train of reasoning, in the way of a direct demonstration, deducing some absurdity or manifest untruth. For hereupon we conclude, that the proposition assumed was false; and thence again, by an immediate consequence, that the proposition to be demonstrated is true. Thus Euclid, in his third book, being to demonstrate that *circles which touch one another inwardly have not the same centre*, assumes the direct contrary to this, viz. that *they have the same centre*; and thence, by an evident train of reasoning, proves that *a part is equal to the whole*. The supposition therefore leading to this absurdity he concludes to be false, viz. that *circles touching one another inwardly have the same centre*; and thence again immediately infers, that *they have not the same centre*.

109  
Ground of  
reasoning in  
indirect demonstrations.

VIII. Now, because this manner of demonstration is accounted by some not altogether so clear and satisfactory; we shall therefore endeavour to shew, that it equally with the other leads to truth and certainty. Two propositions are said to be *contradictory* one of another, when that which is asserted to be in the one is asserted not to be in the other. Thus the propositions, *Circles that touch one another inwardly have the same centre*, and *Circles that touch one another inwardly have not the same centre*, are *contradictory*; because the second asserts the direct contrary of what is asserted in the first. Now, in all contradictory propositions, this holds universally, That one of them is necessarily true, and the other necessarily false. For if it be true, that circles which touch one another inwardly have not the same centre; it is unavoidably false, that they have the same centre. On the other hand, if it be false that they have the same centre, it is necessarily true that they have not the same centre. Since therefore it is impossible for them to be both true or both false at the same time; it unavoidably follows, that one is necessarily true, and the other necessarily false. This then being allowed, which is indeed self-evident, if any two contradictory propositions are assumed, and one of them can by a clear train of reasoning be demonstrated to be false; it necessarily follows, that the other is true. For as the one is necessarily true, and the other necessarily false; when we come to discover which is the false proposition, we thereby also know the other to be true.

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Indirect demonstrations a sure guide to certainty.

IX. Now this is precisely the manner of an indirect demonstration, as is evident from the account given of it above. For there we assume a proposition which directly contradicts that we mean to demonstrate; and, having by a continued series of proofs shewn it to be false, thence

infer, that its contradictory, or the proposition to be demonstrated, is true. As therefore this last conclusion is certain and unavoidable; let us next inquire after what manner we come to be satisfied of the falsehood of the assumed proposition, that so no possible doubt may remain as to the force and validity of demonstrations of this kind. The manner then is plainly this: Beginning with the assumed proposition, we, by the help of definitions, self-evident truths, or propositions already established, continue a series of reasoning, in the way of a direct demonstration, until at length we arrive at some absurdity or known falsehood. Thus Euclid, in the example before-mentioned, from the supposition that circles touching one another inwardly have the same centre, deduces, that *a part is equal to the whole*. Since therefore, by a due and orderly process of reasoning, we come at last to a false conclusion; it is manifest, that all the premises cannot be true: for, were all the premises true, the last conclusion must be so too, by what has been before demonstrated. Now, as to all the other premises made use of in the course of reasoning, they are manifest and known truths by supposition, as being either definitions, self-evident propositions, or truths previously established. The assumed proposition is that only as to which any doubt or uncertainty remains. That alone therefore can be false; and indeed, from what has been already shewn, must unavoidably be so. And thus we see, that in indirect demonstrations, two contradictory propositions being laid down, one of which is demonstrated to be false, the other, which is always the proposition to be proved, must necessarily be true; so that here, as well as in the direct way of proof, we arrive at a clear and satisfactory knowledge of truth.

X. This is universally the method of reasoning in all *apagogical* or indirect demonstrations. But if any proposition is assumed, from which, in a direct train of reasoning, we can deduce its contradictory; the proposition so assumed is false, and the contradictory one true. For if we suppose the assumed proposition to be true, then, since all the other premises that enter the demonstration are also true, we shall have a series of reasoning consisting wholly of true premises; whence the last conclusion or contradictory of the assumed proposition must be true likewise: so that by this means we should have two contradictory propositions both true at the same time, which is manifestly impossible. The assumed proposition therefore, whence this absurdity flows, must necessarily be false; and consequently its contradictory, which is here the proposition deduced from it, must be true. If then any proposition is proposed to be demonstrated, and we assume the *contradictory* of that proposition, and thence directly infer the proposition to be demonstrated; by this very means we know that the proposition so inferred is true. For since from an assumed proposition we have deduced its contradictory, we are thereby certain that the assumed proposition is false; and if so, then its contradictory, or that deduced from it, which in this case is the same with the proposition to be demonstrated, must be true.

XI. We have a curious instance of this in the twelfth proposition of the ninth book of the Elements. Euclid there proposes to demonstrate, that in any series



A due knowledge of the principles of logic indispensably necessary to make us proper judges of demonstration.

of numbers, rising from unity in geometrical progression, all the prime numbers that measure the last term in the series will also measure the next after unity. In order to this, he assumes the contradictory of the proposition to be demonstrated; namely, that some prime number measuring the last term in the series does not measure the next after unity: and thence, by a continued train of reasoning, proves that it actually does measure it. Hereupon he concludes the assumed proposition to be false; and that which is deduced from it, or its contradictory, which is the very proposition he proposed to demonstrate, to be true. Now that this is a just and conclusive way of reasoning, is abundantly manifest from what we have so clearly established above.

XI. Having thus sufficiently evinced the certainty of demonstration in all its branches, and shown the rules by which we ought to proceed, in order to arrive at a just conclusion, according to the various ways of arguing

made use of; it is needless to enter upon a particular consideration of those several species of false reasoning which logicians distinguish by the name of *sophisms*. He that thoroughly understands the form and structure of a good argument, will of himself readily discern every deviation from it. And although *sophisms* have been divided into many classes, which are all called by sounding names, that therefore carry in them much appearance of learning; yet are the errors themselves so very palpable and obvious, that it would be lost labour to write for a man capable of being misled by them. Here therefore we choose to conclude this part of logic; and shall in the next give some account of *Method*: which, though inseparable from reasoning, is nevertheless always considered by logicians as a distinct operation of the mind; because its influence is not confined to the mere exercise of the reasoning faculty, but extends in some degree to all the transactions of the understanding.

And of itself sufficient to guard us against error and false reasoning.

## P A R T IV. O F M E T H O D.

The understanding sometimes employs in putting together known truths.

WE have now done with the three first operations of the mind, whose office it is to search after truth, and enlarge the bounds of human knowledge. There is yet a fourth, which regards the disposal and arrangement of our thoughts, when we endeavour so to put them together as that their mutual connection and dependence may be clearly seen. This is what logicians call *Method*, and place always the last in order in explaining the powers of the understanding; because it necessarily supposes a previous exercise of our other faculties, and some progress made in knowledge, before we can exert it in any extensive degree.

Sometimes in the search and discovery of such as are unknown.

II. In this view, it is plain that we must be beforehand well acquainted with the truths we are to combine together; otherwise, how could we discern their several connections and relations, or so dispose of them as their mutual dependence may require? But it often happens, that the understanding is employed, not in the arrangement and composition of known truths, but in the search and discovery of such as are unknown. And here the manner of proceeding is very different. We assemble at once our whole stock of knowledge relating to any subject, and, after a general survey of things, begin with examining them separately and by parts. Hence it comes to pass, that whereas, at our first setting out, we were acquainted only with some of the grand strokes and outlines of truth; by thus pursuing her through her several windings and recesses, we gradually discover those more inward and finer touches whence she derives all her strength, symmetry, and beauty. And here it is, that when, by a narrow scrutiny into things, we have unravelled any part of knowledge, and traced it to its first and original principles, inasmuch that the whole frame and contexture of it lies open to the view of the mind; here it is, that, taking it the contrary way, and beginning with these principles, we can so adjust and put together the parts as the order and method of science requires.

III. But as these things are best understood when illustrated by examples; let us suppose any machine, for

instance a watch, presented to us, whose structure and composition we are as yet unacquainted with, but want, if possible, to discover. The manner of proceeding, in this case, is, by taking the whole to pieces, and examining the parts separately, one after another. When, by such a scrutiny, we have thoroughly informed ourselves of the frame and contexture of each, we then compare them together, in order to judge of their mutual action and influence. By this means we gradually trace out the inward make and composition of the whole, and come at length to discern how parts of such a form, and so put together as we found in unravelling and taking them asunder, constitute that particular machine called a *watch*, and contribute to all the several motions and phenomena observable in it. This discovery being made, we can take things the contrary way, and, beginning with the parts, so dispose and connect them as their several uses and structures require, until at length we arrive at the whole itself, from the unravelling of which these parts resulted.

IV. And as it is in tracing and examining the works of art; so is it, in a great measure, in unfolding any part of human knowledge: for the relations and mutual habitudes of things do not always immediately appear upon comparing them one with another. Hence we have recourse to intermediate ideas; and, by means of them, are furnished with those previous propositions that lead to the conclusion we are in quest of. And if it so happen that the previous propositions themselves are not sufficiently evident, we endeavour, by new middle terms, to ascertain their truth; still tracing things backward, in a continual series, until at length we arrive at some syllogism where the premises are first and self-evident principles. This done, we become perfectly satisfied as to the truth of all the conclusions we have passed through, inasmuch as they are now seen to stand upon the firm and immovable foundation of our intuitive perceptions. And as we arrived at this certainty by tracing things backward to the original principles whence they flow; so may

Illustrated by the similitude of a watch.

Ground of the analytic and synthetic methods.

we at any time renew it by a direct contrary process, if, beginning with these principles, we carry the train of our thoughts forward until they lead us, by a connected chain of proofs, to the very last conclusion of the series.

<sup>118</sup>  
Division of  
method into  
analytic and  
synthetic.  
V. Hence it appears, that, in disposing and putting together our thoughts, either for our own use, that the discoveries we have made may at all times lie open to the review of the mind, or where we mean to communicate and unfold the discoveries to others, there are two ways of proceeding equally within our choice: for we may so propose the truths relating to any part of knowledge, as they presented themselves to the mind in the manner of investigation; carrying on the series of proofs, in a reverse order, until they at last terminate in first principles: or, beginning with these principles, we may take the contrary way, and from them deduce, by a direct train of reasoning, all the several propositions we want to establish. This diversity in the manner of arranging our thoughts gives rise to the twofold division of method established among logicians: for method, according to their use of the word, is nothing else but the order and disposition of our thoughts relating to any subject. When truths are so proposed and put together as they were or might have been discovered, this is called the *analytic method*, or the *method of resolution*; inasmuch as it traces things backward to their source, and resolves knowledge into its first and original principles. When, on the other hand, they are deduced from these principles, and connected according to their mutual dependence, inasmuch that the truths first in order tend always to the demonstration of those that follow; this constitutes what we call the *synthetic method*, or *method of composition*. For here we proceed by gathering together the several scattered parts of knowledge, and combining them into one whole or system, in such manner that the understanding is enabled distinctly to follow truth through all her different stages and gradations.

VI. There is this farther to be taken notice of, inre-

lation to these two species of method; that the first has also obtained the name of the *method of invention*, because it observes the order in which our thoughts succeed one another in the invention or discovery of truth. The other, again, is often denominated the *method of doctrine or instruction*; inasmuch as, in laying our thoughts before others, we generally choose to proceed in the synthetic manner, deducing them from their first principles. For we are to observe, that although there is great pleasure in pursuing truth in the method of investigation, because it places us in the condition of the inventor, and shews the particular train and process of thinking by which he arrived at his discoveries; yet is it not so well accommodated to the purposes of evidence and conviction. For, at our first setting out, we are commonly unable to divine where the analysis will lead us; inasmuch that our researches are for some time little better than a mere groping in the dark. And even after light begins to break in upon us, we are still obliged to many reviews, and a frequent comparison of the several steps of the investigation among themselves. Nay, when we have unravelled the whole, and reached the very foundation on which our discoveries stand, all our certainty, in regard to their truth, will be found in a great measure to arise from that connection we are now able to discern between them and first principles, taken in the order of composition. But in the synthetic manner of disposing our thoughts, the case is quite different: for as we here begin with the intuitive truths, and advance by regular deductions from them, every step of the procedure brings evidence and conviction along with it; so that, in our progress from one part of knowledge to another, we have always a clear perception of the ground on which our assent rests. In communicating therefore our discoveries to others, this method is apparently to be chosen, as it wonderfully improves and enlightens the understanding, and leads to an immediate perception of truth.

## L E G

## L E I

Lochoch  
||  
Lolu m.

LOHOCH, or LOCH, in pharmacy, a composition of a middle consistence between a soft electuary and a syrup, principally used in disorders of the lungs.

LOINS, in anatomy, the two lateral parts of the umbilical region of the abdomen.

LOIRE, the largest river in France, rises in the mountains of the Cevennes, and, after running a course of about 500 miles, falls into the bay of Biscay.

LOLIUM, DARNELL-GRASS; a genus of the digynia order, belonging to the triandria class of plants. The most remarkable species are, 1. The perenne, red daniel, or rye-grass. This is very common in roads and dry pastures. It makes excellent hay upon dry, chalky, or sandy soils. It is advantageously cultivated along with clover, and springs earlier than other grasses; thereby supplying food for cattle at a time when it is most difficult to be obtained. Cows, horses, and sheep, eat it; goats are not fond of it. 2. The temulentum, or white daniel, grows spontaneously in ploughed fields. If the seeds of this species are malted with barley, the ale soon occasions drunkenness; mixed with bread-corn, they produce but little effect

unless the bread is eaten hot. Sleep are not fond of Lokman.

LOKMAN the WISE, an eminent philosopher among the Easterns. The Arabians say he was the son of Baura, the son or grandson of a sister or aunt of Job. He was an Ethiopian, and a slave for some time. It is related that he was born in the time of David, and lived till the age of the prophet Jonas. Some suppose him to have been the same with Æsop the mythologist: and indeed we find in the parables or apologies of Lokman in Arabic, many particulars that are seen in Æsop's fables; so that it is not easy to determine whether the Greek or the Arabian are the originals. He is said to have been deformed in his person; but that this defect was sufficiently made up by the perfections of his mind. Some pieces of his are extant; and he was looked upon as so excellent a person, that Mahomet has inserted a chapter of the Koran, called after his name, in which he introduces God as saying, "We heretofore bestowed wisdom on Lokman."—It is related that he got his liberty on the following occasion. His master having given him a bitter

Lollards  
Lombards

melon to eat, he eat it all. His master, surprised at his exact obedience, asked, How it was possible for him to eat such a nauseous fruit? He answered, "I have received too many favours from you, that it is no wonder I should once in my life eat a bitter melon from your hand." This generous answer of the slave struck the master to such a degree, that he immediately gave him his liberty. M. Galland translated all the fables of Lokman, and Bidpai, or Pilpay, a bramin philosopher; which were published at Paris in 1724.

LOLLARDS, a religious sect which arose in Germany about the beginning of the 14th century; so called from its author Walter Lollard, who began to dogmatize in 1315.

LOLLARD, and his followers, rejected the sacrifice of the mass, extreme unction, and penances for sin; arguing that Christ's sufferings were sufficient. He is likewise said to have set aside baptism, as a thing of no effect; and repentance, as not absolutely necessary, &c.—Lollard was burnt alive at Cologne, in 1322. In England, the followers of Wickliff were called, by way of reproach, *Lollards*, from some affinity there was between some of their tenets; though others are of opinion, that the English *Lollards* came from Germany. See WICKLIFFITE. They were solemnly condemned by the archbishop of Canterbury, and the council of Oxford.

LOMBARD (Lambert), an eminent painter, born at Liege in 1500; who, after a diligent study of the antique at Rome, introduced that style of painting among his countrymen, instead of the Gothic. He painted history, architecture, and perspective; and though he could never altogether free himself from his national goût, he is ranked among the best painters of his time. He died in 1560.

LOMBARD (Peter), well known by the title of *Master of the Sentences*, was born at Novara in Lombardy; but being bred at Paris, he distinguished himself so much at that university, that he first had the canonry of Chartres conferred on him, was some time tutor to Philip son of Louis le Gros, and lastly obtained the see of Paris. He died in 1064. His work of the *Sentences* is looked on as the source of the scholastic theology of the Latin church. He wrote also *Commentaries on the Psalms*, and on *St Paul's Epistles*.

LOMBARDS, a Scandinavian nation, who formerly settled in Italy, and for some time made a considerable figure.

Etymology  
of the name.

Their name of *Lombards*, or *Longobards*, is by some derived from the word *lack*, or *lache*, signifying in the German tongue *water*; because the Lombards, while in Scandinavia, lived in marshes, or near the sea. Others think that it comes from the two German words *langen barden*, or *helleborden*, that is, from the long halberds they were supposed to use in war. But Paulus Diaconus their historian, and who was himself a Lombard, tells us, that they were called *Longobards* from the length of their beards. A nation called the *Lombards* is mentioned by Tacitus, Strabo, and Ptolemy; but these are different from the Lombards who afterwards settled in Italy, and are reckoned to be the same with the Gepidæ, whom the Italian Lombards almost exterminated. The Lombards who settled in Italy are

first mentioned by Prosper Aquitanus, bishop of Rhegium in the year 379. That writer tells us, that about this time the Lombards, abandoning the most distant coasts of the ocean, and their native country Scandinavia, and seeking for new settlements, as they were over-flooded with people at home, first attacked and overcame about this time the Vandals in Germany. They were then headed by two chiefs, Ioborus and Aion; who, dying about the year 389, were succeeded by Agilmund, who is commonly reckoned the first king of the Lombards.

Before the time of Odoacer, the Lombard history affords nothing remarkable; in this time, however, they settled on the Danube, in the country of the Rugians, whom Odoacer had almost totally exterminated or carried into captivity. During their stay in this country, they rendered themselves formidable to the neighbouring nations, and carried on successful wars with the Heruli and Gepidæ. In 526, they were allowed by the emperor Justinian to settle in Pannonia; and here they made war a second time with the Gepidæ. Alboinus, the Lombard king, killed the king of the Gepidæ with his own hand, put their army to the rout, and cut such numbers of them in pieces, that they ceased from that time to be a nation. Having caused the deceased king's head to be cut off, he made a cup of his skull, called in the language of the Lombards *schala*, which he made use of in all public entertainments. However, having taken, among many other captives of great distinction, the late king's daughter, by name *Rofamunda*, he married her after the death of his former wife Clodisvinta, the daughter of Clotaire king of France.

By this victory Alboinus gained such reputation, that his friendship was courted by Justinian; and, in consequence of the emperor's application, a body of 6000 Lombards were sent to the assistance of Narfes against the Goths. The success of the Romans in this expedition, the invasion of Italy by the Lombards, and their successes in that country, have been taken notice of under the article ITALY, n° 28—32. At last, Alboinus, having made himself master of Venetia, Liguria, Æmia, Hetruria, and Umbria, was slain by the treachery of his wife, in the year 575, the fourth of his reign. This princess was the daughter of the king of the Gepidæ, whom Alboinus had killed in battle, and made a cup of his skull, as above related. As he was one day feasting at Verona with his chief favourites and principal officers, in the height of his mirth he sent for the queen, and, filling the detested cup, commanded her to drink merrily with her father. Rofamund, struck with horror, hurried out of the room; and, highly incensed against her husband for thus barbarously triumphing over the misfortunes of her family, resolved, at all events, to make him pay dear for such an inhuman and affronting conduct. Accordingly, she discovered her intention to Helmhild the king's shield-bearer, a youth of great boldness and intrepidity. Helmhild peremptorily refused to imbrue his hands in the blood of his sovereign, or to be any way accessory to his death; and in this resolution he persisted till he was, by a shameful stratagem, forced by the queen to a compliance: for she, knowing that he carried on an intrigue with one of her

Lombards  
Vandal, de-  
feated by  
the Lom-  
bards.

They settle  
in the coun-  
ty of the  
Rugians.

4  
Destroy the  
Gepidæ.

5  
Alboinus  
king of the  
Lombards  
assassinated  
at the insti-  
gation of  
his wife.

her



<sup>Lombards</sup> her ladies, placed herself one night in her bed, and receiving the youth, indulged him as if she had been his own mistress in his amorous desires; which she had no sooner done, than, discovering herself to the deceived lover, told him that he must now either put the king to death, or be put to death by him. Helmichild, well apprized, that, after what he had done, his safety depended upon the death of the king, engaged in the treason, which he otherwise abhorred. One day, therefore, while Alboinus was sleeping in his chamber after dinner, Helmichild, with some others whom he had made privy to his design, breaking in unexpectedly, fell upon the king with their daggers. Alboinus, starting up at their first coming in, laid hold of his sword, which he had always by him; but having in vain attempted to draw it, the queen having beforehand fastened it in the scabbard, he defended himself for some time with a footstool; but was in the end overpowered, and dispatched with many wounds.

Rofamund had promised to Helmichild, that, as soon as he had dispatched the king, she would marry him, and, with her person, bestow upon him the kingdom of the Lombards. The first part of her promise she immediately performed; but was so far from being able to bestow the crown upon him, that both of them were obliged to save themselves by flight. They fled to Longinus the exarch of Ravenna, taking with them all the jewels and treasure of the late king. Longinus received her with the greatest marks of friendship and kindness, and assured her of his protection. She had not been long in Ravenna, however, before the exarch, judging that a favourable opportunity now offered of making himself king of Italy by her means, imparted his design to her, and declared his intention to marry her, provided, by some means or other, she dispatched Helmichild.—Rofamund, highly pleased with the proposal, resolved to satisfy her ambition by getting rid of the person whom she had married in order to gratify her revenge. Accordingly, having prepared a strong poison, she mixed it with wine, and gave it to her husband as he came out of the bath, and called for drink, according to his custom. Helmichild had not half emptied the cup, when, by the sudden and strange operation which he felt in his bowels, he concluded what it was; and, with his sword pointed at the queen's breast, compelled her to drink the rest. The poison had the same effect on both; for they died in a few hours. Longinus, on the death of the queen, laid aside all thoughts of making himself king of Italy, and sent the king's treasure to Constantinople, together with Albivinda the daughter of Alboinus by Rofamund, whom she had brought along with her.

After the death of Alboinus, the Lombards chose Clephis, one of the nobility, for their king. He was murdered after a short reign of 18 months; upon which ensued an interregnum of 10 years, as related under the article ITALY, n° 32. During this time, they extended their conquests in that country; but at last the Romans, jealous of their progress, resolved to put a stop to their victories, and, if possible, to drive them quite out. For this purpose, they designed not only to employ their own force, but entered into alliance with the Franks; which so alarmed the Lombards, that they re-established the monarchical form of go-

vernment among themselves, and chose Autharis the son of Clephis for their king. This monarch, considering that the power of the dukes, who had governed Lombardy for the space of 10 years, was during that length of time very much established, and that they would not probably be willing to part with the authority which they had so long enjoyed, allowed them to continue in their government; but obliged them to contribute one moiety of their revenues towards the maintenance and support of his royal dignity, suffering them to dispose of the other as they thought proper. He referred to himself the supreme dominion and authority; and took an oath of the dukes, that, in time of war, they would readily assist him to the utmost of their power. Though he could remove the dukes at pleasure, yet he deprived none of them of their dukedoms, except in cases of treason; nor gave them to others, except when their male-issue failed. Having settled matters in this manner with the dukes, he enacted several wholesome laws against theft, rapine, murder, adultery, and other vices which prevailed among his subjects; and was the first of the Lombard kings who embraced Christianity. Most of his subjects followed the example of their monarch: but, as they were all instructed by Arian bishops, they continued long infested with that heresy; which occasioned great disputes between them and the orthodox bishops of the cities subject to them.

From the re-establishment of the monarchy under Autharis, to the reign of Rotharis in 636, the history of the Lombards affords nothing memorable. This period is remarkable for the introduction of written laws among these people. Before his time they had been governed only by tradition; but Rotharis, imitation of the Romans and Goths, undertook the publishing of written laws; and to those which he enacted, many were added by the succeeding princes. Grotius prefers the method which the Lombards followed in making laws, to that which was practised by the Romans themselves. Among the latter, the emperor was the sole lawgiver; so that whatever pleased him had the force of a law. But the Lombard kings did not assume that power to themselves, since their laws were enacted in public assemblies, convened for that purpose, after they had been maturely examined and approved of by all the lords of the kingdom. From these assemblies were excluded the ecclesiastic order, and the people; so that the legislative power was lodged in the king and nobles alone.

The reign of Rotharis is remarkable, not only for his introducing written laws among his subjects, but for the conquests he made, and the successful wars carried on with the exarch of Ravenna, whom he totally defeated in several engagements, and made himself master of some part of his territories. This monarch died in 652; and the affairs of the Lombards went on prosperously, till the ambition of Luitprand laid the foundation of the total ruin of his kingdom. He ascended the throne of Lombardy in 711, and watched all opportunities of enlarging his dominions at the expence of the emperors. Of this, a fair opportunity offered in 716: for the emperor Leo Isauricus, who at that time reigned in the east, having, by his famous edict, forbidden the worship of images, and ordered them to be every-where pulled down, the people

<sup>Lombards</sup> Autharis the  
<sup>8</sup> Refused.

<sup>9</sup> Written laws when first introduced.

<sup>10</sup> Luitprand's ambition.

<sup>6</sup> Her death.

<sup>7</sup> Monarchy abolished.

Lombards.

people were so provoked at that innovation, that, in several places, they openly revolted, and, falling upon the emperor's officers, drove them out of the cities. In the east, Germanus patriarch of Constantinople opposed the emperor's design with great warmth; but Leo caused him to be deposed, and Anastasius to be raised to that see in his room, ordering at the same time all the images in the imperial city to be pulled down, and publicly burnt. He strictly enjoined his officers in the west, especially the exarch of Ravenna, to see his edict punctually obeyed in their respective governments. In compliance with these orders, Scholasticus, then exarch, began to pull down the images in all the churches and public places in Ravenna; which incensed the superstitious multitude to such a degree, that, taking arms, they openly declared they would rather renounce their allegiance to the emperor, than the worship of images.

Thus a kind of civil war being kindled in the city, Luitprand thought he had now a favourable opportunity of making himself master of the seat of the exarch, not doubting but the conquest of such an important place would be followed by that of the whole ex-

<sup>11</sup> He besieges archate. Having therefore drawn together all his forces, he unexpectedly appeared before Ravenna, and closely besieged it. The exarch little expected such a surprise, as a friendly correspondence had been maintained for many years between the exarchs and the Lombard kings. However, he defended the place with such courage and resolution, that Luitprand, despairing of success, broke up the siege, and led his army against Classis at a small distance from Ravenna, which he took, plundered, and levelled with the ground. The loss of this place, and the severe treatment the inhabitants met with from the king, threw the citizens of Ravenna into the utmost consternation; which Luitprand being informed of, he resolved to take advantage of their fears, and, returning before Ravenna while the inhabitants were thus disheartened, to attempt once more the reduction of that place. Accordingly he led his whole army against it, and, by frequent attacks, tired the inhabitants and garrison to such a degree, that the exarch, finding they could hold out no longer, and despairing of relief, privately withdrew. Luitprand, informed of his retreat, attacked the town with more violence than ever; and, having carried it by storm, gave it up to be plundered by his soldiers, who found in it an immense booty, as it had been for a long time the seat of the Roman emperors, of the Gothic kings, and the exarchs. The king stripped it of most of its valuable monuments of antiquity, and caused, among the rest, an equestrian statue of an emperor, of wonderful workmanship, to be conveyed to Pavia, where it is to be seen to this day. The reduction of Ravenna was followed by the surrender of several cities

<sup>12</sup> Reduces the of the exarchate, which Luitprand reduced to a dukedom; appointing Hildebrand, his grandson, to govern it with the title of duke; and giving him, as he was yet an infant, Peredeus duke of Vicenza for his guardian.

The conquest of Ravenna and the greater part of the exarchate, did not a little alarm Gregory II. bishop of Rome. He was then at variance with the emperor, whose edict against the worshipping of ima-

ges he had opposed with all his might, and by that means provoked Leo to such a degree, that he had threatened to drive him from the see, and send him into exile. However, the pope, no less jealous of the power of the Lombards, than all his predecessors had been, resolved, by some means or other, to put a stop to their conquests. The only prince in Italy to whom he could have recourse, was Ursus duke of Venice, the Venetians making already no inconsiderable figure. To him accordingly he wrote a very pressing

<sup>13</sup> The exarch letter; conjuring him to assist his worthy son the ex-arch, and, for the love of the holy faith, to attempt the recovery of the exarchate, which the wicked nation of the Lombards had unjustly taken from his sons Leo and Constantine emperors. Ursus and the Venetians, moved with the pope's letter, and at the same time greatly alarmed at the growth of so powerful a neighbour, promised to assist the exarch with the whole strength of their republic; and accordingly fitted out a considerable fleet, pretending it was designed for the service of the emperor against the Saracens. At the same time the exarch, who had taken refuge in Venice, abandoning that place, as it were in despair of bringing the duke over to his party, raised, in the places still subject to the emperor, what forces he was able; and, having got together a considerable body, he marched with them towards Imola, giving out that he designed to besiege that city; but, turning on a sudden towards Ravenna, as had been agreed on between him and the Venetians, he laid siege to it by land, while they invested it almost at the same instant by sea. Peredeus defended the town for some time with great courage and resolution; obliging all those who were able to bear arms, to repair to the walls. But the Venetians having, in spite of all opposition, forced open one of the gates on the side of the sea, the city was taken, and Peredeus slain, while he was attempting, at the head of a choice body, to drive the enemy from the posts they had seized. As for Hildebrand, he fell into the hands of the Venetians; who, having thus recovered Ravenna to the emperor, returned home, leaving the exarch in possession of the city. Luitprand was then at Pavia; but the town was taken before he could assemble his troops to relieve it.

And now Gregory bishop of Rome, to whom the recovery of Ravenna was chiefly owing, persuading himself, that the emperor would, out of gratitude, give ear to his remonstrances and admonitions, began to solicit him with more pressing letters than ever to revoke his edict against the worship of images; but Leo, well apprised, that the bishop, in all the measures he had taken, had been more influenced by a regard to his own interest, than to that of the empire, instead of hearkening to his remonstrances, was still more provoked against him for thus obstinately opposing the execution of his edict. Being therefore resolved at all events to have it observed in Rome itself, and, on the other hand, not doubting but the pope would oppose it to the last with all his might; in order to remove all obstacles, he sent three officers to Rome, with private orders, either to dispatch the pope, or to take him prisoner and convey him to Constantinople. At the same time he wrote to Mauritius duke of Rome, secretly enjoining him to assist his three officers

<sup>14</sup> Who retake Ravenna.

Lombards. in their undertaking : but no favourable opportunity offering to put their design in execution, the emperor, in the year 725, recalled Scholasticus, and sent Paul a patrician into Italy, to govern in his room, with private instructions to encourage the above-mentioned officers with the promise of great rewards, and to assure them of his protection.

But in the mean time the plot was discovered, and two of the conspirators were apprehended by the citizens of Rome, and put to death; the third having escaped into a monastery, where he took the monastic habit, and ended his days. Hereupon the exarch, in compliance with the emperor's orders, resolved to proceed no longer by secret plots, but by open force. Accordingly, he drew together a considerable body of troops, and set out at the head of them on his march to Rome, with a design to seize on the pope, and send him, as he had engaged to do, in chains to Constantinople. But, on this occasion, Luitprand, though highly provoked against Gregory for having stirred up the Venetians against him, yet resolved to assist him and the citizens of Rome against the exarch, in order to keep the balance even between them, and, by assisting sometimes the one and sometimes the other, weaken both. Pursuant to this resolution, he ordered the Lombards of Tuscany, and those of the dukedom of Spoleto, to join the pope and the inhabitants of Rome; who, being, by this reinforcement, far superior in strength and number to the exarch, obliged him to return to Ravenna, and give over all thoughts of any further attempt on the person of the pope.

15  
Luitprand  
assists the  
pope against  
the exarch.

In the mean time, Leo, persisting in his former resolution of suppressing throughout his dominions the worship of images, sent fresh orders to the exarch Paul, strictly enjoining him to cause his edict to be put in execution in all the cities of Italy under his empire, especially in Rome. At the same time he wrote to the pope; promising him his favour and protection, if he complied with the edict; and declaring him, if he continued to oppose it, a rebel, and no longer vested with the papal dignity. But Gregory was so far from yielding to the emperor's threats or promises, that, on the contrary, he solemnly excommunicated the exarch for attempting to put the imperial edict in execution; and at the same time wrote circular letters to the Venetians, to king Luitprand, to the Lombard dukes, and to all the chief cities of the empire, exhorting them to continue steadfast in the Catholic faith, and to oppose with all their might such a detestable innovation. These letters made such an impression on the minds of the people in Italy, that, though of different interests, and often at war with one another, they all united; protesting they would defend the Catholic faith, and the life of the pope, in so glorious a cause, at the expense of their own: nay, the citizens of Rome, and the inhabitants of Pentapolis, now Marca d' Ancona, not contenting themselves with such a protestation, openly revolted from the emperor; and, pulling down his statues, they elected, by their own authority, magistrates to govern them during the interregnum. We are even told, that, transported with a blind zeal, they were for choosing a new emperor, and conducting him to Constantinople, not doubting but the people would every-where join them. But the pope, thinking this resolution unseemly, and not to be easily

put in execution, opposed it; so that it did not take place.

In the mean time, the exarch Paul, having gained a considerable party in Ravenna, began, pursuant to the repeated orders from the emperor, to remove the images, as so many idols, out of the churches. Hereupon the adverse party, supported and encouraged by the pope, flew to arms; and, falling upon the *iconoclasts* or image-breakers, as they styled them, gave rise in Ravenna, <sup>16</sup> A civil war to a civil war within the walls of Ravenna. Great numbers were killed on both sides: but those who were for the worship of images prevailing in the end, a dreadful slaughter was made of the opposite party; and, among the rest, the exarch himself was murdered. However, the city of Ravenna continued faithful to the emperor; but most of the cities of Romagna belonging to the exarchate, and all those of Pentapolis or La Marca d'Ancona, abhorring the emperor as an heretic, submitted to Luitprand king of the Lombards; who, pretending a zeal for the Catholic religion, took care to improve the discontent of the people to his advantage, by representing to them, that they could never maintain their religious rights under a prince, who was not only an heretic, but a persecutor of the orthodox.

In Naples, Exhilaratus, duke of that city, having received preperatory orders from the emperor to cause his edict to be put in execution, did all that lay in his power to persuade the people to receive it; but finding all his endeavours thwarted by the bishop of Rome, for whom the Neapolitans had a great veneration, he hired assassins to murder him. But the plot being discovered, though carried on with great secrecy, the Neapolitans, highly provoked against the duke, tore both him and his son to pieces, and likewise put to death one of his chief officers, who had composed a libel against the pope. Luitprand, and Gregory at that time duke of Benevento, laying hold of so favourable an opportunity to make themselves masters of the dukedom of Naples, did all that lay in their power to persuade the Neapolitans to submit to them. But the Neapolitans, bearing an irreconcilable hatred to the Lombards, with whom they had been constantly at variance, rejected every overture of that nature with the utmost indignation; and, continuing steadfast in their allegiance to Leo, received from Constantinople one Peter, who was sent to govern them in the room of Exhilaratus. Some writers suppose the Neapolitans, in this general revolt of the cities of Italy, to have shaken off the yoke with the rest, and to have appointed magistrates of their own election to govern them, in the room of the officers hitherto sent from Constantinople, or named by the exarch: but they are certainly mistaken; it being manifest from history, that Peter succeeded Exhilaratus in that dukedom, and that the Neapolitans continued to live under the emperors till they were conquered many years after by the Normans.

In the mean time, Leo hearing of the murder of the exarch, and the general revolt of the cities, and not doubting but the pope was the chief author of so much mischief, sent the eunuch Eutychius into Italy, with the title and authority of *exarch*, strictly enjoining him to get the pope dispatched by some means or other, since his death was absolutely necessary for the tran-

tran-



Lombards.

tranquillity of Italy. The exarch spared no pains to get the pope into his power: but a messenger, whom he had sent to Rome, being apprehended by the citizens, and an order from the emperor being found upon him to all his officers in that city, commanding them to put the pope to death at all events, the pope's friends thenceforth guarded him with such care, that the exarch's emissaries could never afterwards find an opportunity of executing their design. As for the messenger, the Romans were for putting him to death; but the pope interposed, contenting himself with excommunicating the exarch.

17  
The Romans re-  
volt.

And now the Romans, provoked more than ever against Leo, and, on the other hand, unwilling to live under the Lombards, resolved to revolt from the emperor, and appoint their own magistrates, keeping themselves united under the pope, not yet as their prince, but only as their head. This they did accordingly; and from these slender beginnings the sovereignty of the popes in Italy took its rise, though they did not then, as is commonly supposed by historians, but many years after, become sovereign lords of Rome.

Eutychius failed in his design upon the life of the pope; but, having brought with him from Constantinople a good number of troops, he easily quelled the rebellion in Ravenna, and severely punished the authors of the late disturbances. As for the rebellious Romans, he was well apprised he could never reduce them, so long as they were supported by the king of the Lombards; and therefore he employed all his art and policy to take off that prince from the party of the Romans, and bring him over to his own.

18  
Luitprand con-  
cludes an alliance  
with the  
exarch.

Luitprand, for some time, withstood all his offers; but Thrasimund duke of Spoleto revolting at this very juncture, the exarch, laying hold of that opportunity, offered to assist the king with all his strength against the rebellious duke, provided he would, in like manner, assist him against the pope and the Romans. With this proposal Luitprand readily closed; and a league being concluded upon these terms between him and the exarch, the two armies joined, and began their march towards Spoleto. At their approach, the duke, despairing of being able to resist two such powers, came out with a small attendance to meet them, and, throwing himself at the king's feet, sued, in that humble posture, for pardon; which Luitprand not only granted him, but confirmed him in the dukedom, after he had obliged him to take a new oath of allegiance, and give hostages for his fidelity in time to come. From Spoleto the two armies marched, in pursuance of the treaty, to Rome; and encamped in the meadows of Nero, between the Tiber and the Vatican.

19  
The pope  
submits to  
Luitprand.

Gregory had caused the city of Rome to be fortified in the best manner he could: but, being sensible that the Romans alone could not long hold out against two such armies, and reflecting on the kind treatment the duke of Spoleto had met with upon his submitting to the king, he resolved to follow his example; and accordingly, taking with him some of the clergy, and the principal inhabitants of the city, he went to wait on the king in his camp; and there, with a pathetic speech, as he was a great master of eloquence, softened Luitprand to such a degree, that, throwing him-

self at his feet in the presence of the whole army, Lombards, he begged pardon for entering into an alliance against him: and, assuring him of his protection for the future, he went with him to the church of St Peter; and there, disarming himself in the presence of his chief officers, he laid his girdle, his sword, and his gantlet, with his royal mantle, his crown of gold, and cross of silver, on the apostle's sepulchre. After this, he reconciled the pope with the exarch, who was thereupon received into the city, where he continued for some time, maintaining a friendly correspondence with the pope. At this time an impostor, taking the name of *Tiberius*, and pretending to be descended from the emperors, seduced a great many people in Tuscany, and was by them proclaimed emperor. The exarch resolved to march against him; but, as he had not sufficient forces to oppose the rebels, Gregory, who let no opportunity slip of obliging Leo, persuaded the Romans to attend the exarch in this expedition; by which means the usurper being taken in a castle, his head was sent to the emperor, and the rebellion utterly suppressed. But, the emperor still insisting upon his edict against the images being received in Rome, the Romans, at the instigation of the pope, publicly renounced their allegiance to Leo, paid him no more tribute, and withdrew for ever their obedience to the emperors of the east.

Leo, informed of this revolt, and not questioning the pope was the author of it, immediately counted all the patrimonies of the church of Rome in Sicily, Calabria, and his other dominions, to be confiscated. At the same time he ordered a powerful army to be raised, with a design to recover the towns that had revolted; to chastise the Romans for their rebellion; and, above all, to be revenged on the pope, who had raised all these disturbances, by opposing himself, and persuading others to oppose, the execution of his edict. Gregory, alarmed at the warlike preparations that were carrying on throughout the empire, and well apprised that they were chiefly designed against him and the Romans, resolved to recur to the protection of the French, the only nation at that time capable of coping with the emperor, and on whom, on account of their zeal for religion, he thought he might depend. The Lombards were then very powerful; but, as they wanted to be masters of Rome, he did not think it advisable to trust them. The Venetians, though zealous in the defence of the pope, were not yet in a condition to withstand the power of the emperor; and, besides, were jealous of the Lombards, who watched all opportunities of enlarging their dominions at the expense of their neighbours. As for Spain, it was then in a most deplorable condition, being over-run, and almost wholly ruined, by the Saracens.

The French nation was at this time governed by Who ap- the celebrated Charles Martel, who had distinguished plies to the himself in a most eminent manner in the wars of France. France and Germany; and had, not long before, gained a signal victory over the Saracens in the neighbourhood of Tours; whence he was generally reputed the best commander, and the greatest hero, of his time. To him therefore Gregory sent a solemn embassy, with a great number of relics, a famous intreating him to take the Romans, and the church, under

20  
The empe-  
or seizes  
the domi-  
nions of  
the pope.

21

Lombards  
||  
Loch-  
Lomond.

der his protection, and defend them against the attempts of Leo. The embassadors were received with extraordinary marks of honour; and a treaty was soon concluded between them and Charles, who engaged to march into Italy in person, at the head of a powerful army, in defence of the Romans and the church, if they should be attacked either by the emperor or the Lombards. On the other hand, the Romans were to acknowledge him for their protector, and confer on him the honour of the consulship, as it had been formerly conferred on Clovis by the emperor Anastasius, after that prince had defeated the Visigoths. The embassadors returned from France loaded with rich presents. But Gregory did not long enjoy the fruit of their negotiations; for he died the same year 731, and was succeeded by Gregory III. in whose time some place the above-mentioned embassy.

22  
End of the  
Lombard  
monarchy.

The French nation was at this time just recovered from its distressed situation under the descendants of Clovis; and, by the bravery and conduct of Charles Martel, had become the most powerful kingdom in the west. His successor Pepin, was no less wife and powerful than his father had been; and as the ambition of the Lombard princes would be satisfied with nothing less than the entire conquest of Italy, the French monarch, Charlemagne, under colour of assisting the pope, at last put an end to the empire of Lombardy, as related under the article FRANCE, n° 21, 22.

23  
Character,  
&c. of the  
Lombards.

The Lombards were at first a cruel and barbarous nation; but, divesting themselves by degrees of their native fierceness and barbarity, especially after they had embraced the Christian religion, they governed with such equity and moderation, that most other nations envied the happiness of those who lived under them. Under the government of the Lombards, says Paulus Diaconus, no violence was committed, no one unjustly dispossessed of his property, none oppressed with taxes; theft, robberies, murder, and adultery, were seldom heard of: every one went, without the least apprehension, wherever he pleased. Their laws were so just and equitable, that they were retained in Italy, and observed there, some ages after their kingdom was at an end.—According to Paulus Diaconus, also, their dress was loose, and for the most part of linen, such as the Anglo-Saxons wore, being interwoven with various colours; that their shoes were open to the end of their foot, and that they used to button or lace them. From some ancient paintings, it appears, that they shaved the back part of their heads; but that their hair was long before; their locks being parted, and laid on each side their foreheads.

**LOMENTACEÆ**, in botany, (from *lomentum*, a colour used by painters), the name of the 33d order in Linnæus's fragments of a natural method, consisting of the following genera, many of which furnish beautiful tinctures that are used in dyeing, viz. *adenanthera*, *banhinia*, *calalpinia*, *castia*, *ceratonia*, *cercis*, *gleditkia*, *gulandina*, *hematoxylon*, *hymenaea*, *mimola*, *parkinsonia*, *poinciana*, *polygama*. See BOTANY, p. 1311.

**LOCH LOMOND**, a large lake of Dunbarton or Lennox shire in Scotland, of which Mr Pennant gives the following description. "Loch-lomond, the last, the most beautiful of the Caledonian lakes. The first view of it from Tarbat presents an extensive serpentine

winding amidst lofty hills; on the north, barren, black, and rocky, which darkens with their shade that contracted part of the water. On the west side, the mountains are clothed near the bottoms with woods of oak quite to the water-edge; their summits lofty, naked, and craggy. On the east side, the mountains are equally high; but the tops form a more even ridge parallel to the lake, except where Ben-lomond, like Saul amidst his companions, overtops the rest. The upper parts were black and barren; the lower had great marks of fertility, or at least of industry, for the yellow corn was finely contrasted with the verdure of the groves intermixed with it.

"This eastern boundary is part of the Grampian hills, which extend from hence through the counties of Perth, Angus, Meams, and Aberdeen. The road runs sometimes through woods, at others is exposed and naked; in some, so steep as to require the support of a wall; the whole the work of the soldiery: blessed exchange of instruments of destruction for those that give safety to the traveller, and a polish to the once inaccessible native!—Two great head-lands covered with trees separate the first scene from one totally different; the last is called the *Point of Firkin*. On passing this cape an expanse of water bursts at once on your eye, varied with all the softer beauties of nature. Immediately beneath is a flat covered with wood and corn; beyond, the headlands stretch far into the water, and consist of gentle risings; many have their surfaces covered with wood, others adorned with trees loosely scattered either over a fine verdure, or the purple bloom of the heath. Numbers of islands are dispersed over the lake, of the same elevated form as the little caeps, and wooded in the same manner; others just peep above the surface, and are tufted with trees; and numbers are so disposed as to form magnificent vistas between.

"Opposite Luls, at a small distance from shore, is a mountainous isle almost covered with wood; is near half a mile long, and has a most fine effect. I could not count the number of islands, but was told there are twenty-eight; the largest two miles long, and stocked with deer.

"The length of this charming lake is 24 Scotch miles; its greatest breadth, eight; its greatest depth, which is between the point of Firkin and Ben-lomond, is 120 fathoms. Besides the fish common to the lochs are guinids, called here *poans*.

"The surface of Loch-lomond has for several years past been observed gradually to increase, and invade the adjacent shore: and there is reason to suppose that churches, houses, and other buildings, have been lost in the water. Near Luls is a large heap of stones at a distance from the shore, known by the name of the old church; and about a mile to the south of that, in the middle of a large bay, between Camstraddan and the isle Inch-lavanack, is another heap, said to have been the ruins of a house. To confirm this, it is evident by a passage in Camden's *Atlas Britannica*, that an island, existing in his time, is now lost; for he speaks of the isle of Camstraddan, placed between the lands of the same name and Inch-lavanack, in which, adds he, was an house and orchard. Besides this proof, large trees with their branches still adhering are frequently found in the mud near the shore,

Loch-  
Lomond.

London, overwhelmed in former times by the increase of water. This is supposed to be occasioned by the vast quantities of stone and gravel that is continually brought down by the mountain rivers, and by the falls of the banks of the Leven; the first filling the bed of the lake, the last impeding its discharge through the bed of the river.

"Mr Golborne, at the request of the several proprietors, has made a voyage and survey of the lake, in order to plan some relief from the incroachment of the water. He proposes to form a constant navigation down the Leven, by deepening the channel, and cutting through the neck of two great curvatures: which will not only enable the inhabitants of the invirons of Loch-lomond to convey their slate, timber, bark, &c. to the market; but also, by lowering the surface of the lake, recover some thousands of acres now covered with water."

LONDON, a large city of Middlesex in England, the metropolis of Great Britain, and one of the most wealthy and populous places in the world, is situated on the river Thames, in Long. 000. N. Lat. 51. 32.

<sup>1</sup> Its different names. The most ancient name of this city is *Londinium*, or *Lundinium*, according to Ammianus. It was then changed into *Augusta*; in honour, as some say, of Helena Augusta, the mother of Constantine the Great; while others think it more probable that it had this name from the second legion, whose peculiar title was *Augusta*; and some imagine that the honourable appellation of *Augusta*, was conferred upon this city by the Romans, as upon other principal cities of their empire, on account of its being grown up to be the capital of their British province. How long the name of *Augusta* prevailed is not now certainly known; but after the establishment of the Saxons we find no more mention of *Augusta*. It was then called *Caer Lundain*, *Lundoun* Byrig, *Lunden* Cæster, *Lunden-ryce*, *Lundenne*, *Lunden-berh*, or *Lundenburg*; and since the conquest the records call it *Londonia*, *Lundonia*, *Londino*, *Londres*, and, for several ages past, *London*, a manifest corruption from Tacitus's *Londinium*. The most probable derivation of these names, according to Mr Entick, is from the British words *lbong*, "a ship," and *dinas*, "a city;" i. e. a city or harbour for ships; for which, it appears from Tacitus, to have been famous from its first foundation.

<sup>2</sup> When founded. The city of London cannot be reckoned more ancient than the time of Julius Cæsar. Geoffrey of Monmouth indeed relates, that, before the Roman invasion, London was a town encompassed with walls, and fortified with innumerable towers: but herein he deserves no credit; for Cæsar informs us, that in his time the Britons had no other towns than thick woods surrounded with a ditch, and fortified with a rampart. The foundation of the town is with the greatest probability ascribed to Ostorius Scapula, about the year 49, for the security of the Roman allies, who were before too much exposed to the incursions of the Britons. It is indeed conjectured, and that not without a great degree of probability, that at this time the river Thames, by reason of the great spreading of its waters, was fordable at the place where London now stands, and that London was built particularly with a view to secure and command this ford. The embanking of the river, and the stoppage of the tide at Lon-

don bridge, have greatly increased the depth of the water since that time, so that it is now very far from being fordable there.

At first, London had no walls or other fortifications <sup>3</sup> by to defend it, and was therefore exposed to the attacks of the Britons, of every enemy: and thus it suffered severely about the year 64, being burnt by the Britons under Boadicea, and all the inhabitants massacred. Soon after this, however, it was restored by the Romans, and increased so much, that in the reign of the emperor Severus it is called by Herodian, a great and wealthy city. About the same time it was made a Roman prefecture, in imitation of Rome itself; whose prefect was sent annually to do justice, and to act in all public matters, such as taxes, tributes, impôts, and military affairs, as directed by the Roman senate. It continued in a defenceless state till the year 296, or 298, when walls were built round it on the following occasion. The <sup>4</sup> Surrounded with walls.

province of Britain had for some time been dismembered from the empire by Carausius, who revolted from the emperors Dioclesian and Maximian; but he being murdered by one Caius Allectus, a Roman army was dispatched against this new usurper. Allectus called in the Franks to support him; but being defeated and killed, his allies determined to plunder the city of London: but while they were busy in so doing, the Romans arrived, and cut them all in pieces. To prevent disasters of a similar kind for the future, a wall of hewn stone and British bricks was erected round the city. It was three miles and 165 feet in circumference; the figure quadrangular, but not equilateral, the sides being longer from east to west than from north to south. The vestiges of this wall are still to be seen. In the Saxon times, and probably from its first foundation, it extended along the side of the river; and if it is not at present possible to trace the foundations along the river-side, this may justly be supposed owing to the many and great encroachments made by wharfs, which are continually gaining upon it, so that now they advance as far as the fourth pier of London bridge.

<sup>5</sup> Dr Woodward, in his Roman Antiquities and Present State of London, informs us, that he had an opportunity of examining the fabric and composition or materials of which these walls were built, from digging at Bishop's-gate for the foundation of certain houses to be erected in 1707. He writes, that the said wall, from the foundation, eight feet below the present surface, quite up to the top, which was in all ten feet more, was compiled alternately of layers of broad slate, bricks, and of rag-stones. The bricks lay in double ranges; and each brick being but one inch and three tenths in thickness, the whole layer, with the mortar interposed, exceeded not three inches. The layers of stone were not quite two feet thick of our measure. This was the height of the Roman work; and these were the remains of the ancient Roman wall supposed to be built by Constantine the Great. It was here very observable, that the mortar was, (as usual in the Roman work,) so very firm and hard, that the stone itself as easily broke, and gave way as soon as it. Thus far from the foundation upwards, it was nine feet in thickness: the broad thin bricks were all of Roman make, and of the very sort, as we learn from Pliny, that were in common use among that people; being in length a foot and an half of their standard, and in breadth



<sup>1</sup>London. breadth a foot. Dr Woodward found them 17 inches four-tenths in length, 11 inches six-tenths in breadth, and one inch three-tenths in thickness. On the land-side the city-wall was strengthened and embellished with stately towers; the remains of 15 of which are still to be seen. Dr Woodward discovered one built in the same manner and of the same materials as the wall, 26 feet high, in three stories, behind a house facing Gravel-lane in Houndditch; but much decayed. In searching for this tower, Mr Entick and Mr Maitland found out another, about 80 yards nearer Aldgate, of the same Roman construction, 21 feet high, perfectly found, and much more beautiful: the bricks were as found as when new laid; but most of the stones were decaying, having lain, according to the most probable computation, 1459 years.

<sup>6</sup>  
Submits to the Saxons, and becomes the metropolis of England.

The wall of London was finished about the year 306, and about the same time also it is very probable that a bridge was erected at the place where London-bridge stands; for it is not to be supposed that the city had no commerce with the country south of the river, and a ferry could not by any means be thought adequate to the business. Till the year 457, nothing remarkable happened to the city of London. It was then forced to submit to the Saxons, and became the chief city of the kingdom of Essex; and though it suffered much in the wars carried on between the Britons and Saxons, it soon recovered, so that Bede calls it a *princely mart-town*, under the government of a chief magistrate, whole title of *portgrave*, or *portreeve*, (for we find him called by both names), conveys a grand idea of the mercantile state of London in those early ages, that required a governor or guardian of the port. During the civil wars of the Saxons with each other, the Londoners had always the address to keep themselves neuter; and about the year 819, when all the seven Saxon kingdoms fell under the power of Egbert, London became the metropolis of England, which it has ever since continued.

<sup>7</sup>  
Plundered by the Danes.

During the invasions of the Danes, London suffered greatly. In 849, these invaders entered the Thames with 250 ships, plundered and burnt the city, and massacred the inhabitants; and two years after they returned with a fleet of 350 sail, fully determined to destroy every thing that had elapsed their barbarity in the former expedition. At this time, however, they were disappointed; most of their troops being cut in pieces by king Ethelwolf and his son Athelbald; yet such was the destruction made by those barbarians at London, that it suffered more from these two incursions than ever it had done before.

<sup>8</sup>  
Recovers under Alfred the Great.

In the reign of king Alfred the Great, London began to recover from its former ruinous state. He rebuilt its walls, drove out the Danish inhabitants who had settled there, restored the city to its former liberties and beauty, and committed the care of it to his son-in-law, Ethelred duke of Mercia, in hopes that this might always be a place of secure retreat within its strong walls, whatever might happen from a foreign or domestic enemy. In 893, however, he had the mortification to see his capital totally reduced to ashes by an accidental fire, which could not be extinguished, as the houses at that time were all built of wood. The walls, however, being constructed of incombustible materials, continued to afford the same protection as be-

<sup>9</sup>  
Reduced to ashes.

fore; the houses were quickly rebuilt, and the city divided into wards and precincts for its better order and government. This king also instituted the office of sheriff, the nature of which office made it necessary to have it also in London: so that here we have the glimmerings of the order of magistrates afterwards settled in the city of London; in the person of the portreeve, or portgrave, or governor of the city, as supreme magistrate; in the sheriff, and in the officer or subordinate magistrate by what name soever then distinguished, which, being placed at the head of each ward or precinct, were analogous to the more modern title of *aldermen* and *common-council men*.

<sup>10</sup>  
London. Its government settled.

Alfred having settled the affairs of England in the most prudent manner, directed his attention to the ornamenting, as much as possible, the city of London. For this purpose, he spirited up the English to an emulation in building their houses of stronger and more durable materials than formerly. At that time their houses were mostly of wood; and an house built of any other materials was looked upon as a kind of wonder. But Alfred having begun to raise his palaces of stone and brick, the opulent Londoners, and the nobility resident in and about London followed the example, though the custom did not come into general use till some ages after.

<sup>11</sup>  
Brick and stone houses first erected.

In 1015, a foreign enemy again appeared before London. Canute king of Denmark having invaded and plundered the counties of Dorset, Somerset, and Wilts, sailed up the Thames with 200 ships, and laid siege to the city. The citizens continued faithful, notwithstanding the defection of the greatest part of the kingdom; and made such a brave resistance, that Canute thought fit to withdraw his army, leaving only his fleet to blockade the city by water, that when he found a fair opportunity he might renew the siege with better success. At last, however, being defeated in several battles by Edmund Ironside, he was obliged to call off his ships to cover his own army in case of necessity. In the compromise, however, which was afterwards made between Edmund and Canute, the city of London was given to the latter, and owned him for its lawful sovereign. We have a strong proof of the opulence of London even at this time, from the tax laid upon it by Canute in order to pay his army; this being no less than 10,500*l*. while the rest of the nation was at the same time taxed only at 72,000*l*.

<sup>12</sup>  
Refused by Canute.

In 1046, we have the first instance of the Londoners sending representatives to parliament. This happened on settling the succession to the throne after Canute's death. The English in general declared for Edward son of king Ethelred, or, if that could not be carried, for Hardicanute, son of Canute by queen Emma, and then absent on a tour to Denmark. The city of London espoused the claim and interest of Harold Harefoot, son also of Canute by queen Elgiva of Northampton. Edward's party soon declined; and the Londoners agreed, for the peace of the realm, that the two brothers should divide the kingdom between them; but as Hardicanute did not return in proper time to England, a *wittenage-mote* was held at Oxford, where earl Leofric, and most of the thanes on the north of the Thames, with the pilots of London, chose Harold for their king. Here, by *pilots*, we are to understand the directors, magistrates, or leading

<sup>13</sup>  
Sends representatives to parliament.

London.

men of the city: and this manifestly shews, that London was then of such consequence, that no important national affair was transacted without the consent of the inhabitants; for the Saxon annals assure us, that none were admitted into this assembly of election but the nobility and the pilots of London.

14  
Suffers  
greatly by  
fires, hurri-  
canses, &c.

On the invasion of the Normans under William I. London submitted as well as the rest of the kingdom; and received two charters from that prince, confirming all the privileges they had under the Saxon kings, and adding several new ones. But while the citizens were promising themselves all manner of security and tranquillity under the new government, it was almost entirely reduced to ashes by an accidental fire in 1077. It had scarcely recovered from this calamity, when it was visited by another of the same kind in 1086, which began at Ludgate, and destroyed the best and most opulent part of the city; consuming, among other buildings, the cathedral of St Paul's; which, however, was soon rebuilt more magnificently than before. Under the reign of William Rufus, London suffered considerably by fires, hurricanes, and inundations, and seems to have been depressed by the tyranny of that prince; but Henry I. granted large immunities to the city, which again revived its trade, and was favourable to the progress of the arts. The king, however, still retained the privilege of appointing the portreeve, or chief magistrate; but the immunities granted to the Londoners secured their affections, and tended much to secure him on the throne. At the same time there was such a plenty of all kinds of provisions, that as much corn was sold for 1 s. as would suffice 100 people for a day; 4 d. would purchase as much hay and corn as would maintain 20 horses for a day; and a sheep could be bought for a groat.

15  
Monstrous  
licentious-  
ness of the  
Normans.

Henry thought proper also to check the licentious behaviour of the Normans, which, by the favour shewed them under the two Williams, had carried them into the most barbarous practices. Those who followed William Rufus in his excursions, harassed and plundered the country at discretion. Many of them were so extravagant in their barbarity, that what they could not eat or drink in their quarters, they either obliged the people to carry to market and sell for their use, or else they would throw it into the fire; and, at their going off, they frequently washed their horses' heels with the drink, and flaved the casks containing the remainder. King Henry resolved to put a stop to these excesses and savage customs; and therefore published a proclamation at London, commanding that thenceforward all persons who should be convicted of such barbarities should have their eyes pulled out, or their hands or feet cut off, as the ministers of justice should think fit. This effectually checked the insolence of the Normans, and the city continued to flourish throughout the reigns of Henry I. and Stephen. The attachment of the citizens to Stephen, however, was a crime which never could be forgiven by Henry II. and of consequence he made them sensible of his displeasure by making frequent demands of money from them. About this time, indeed, the Londoners were arrived at such a pitch of licentiousness, that their prosperity seemed a curse rather than a blessing. The sons of the most eminent and wealthy citizens entered into a confederacy to commit burglaries, and to rob

16  
Of the  
Londoners.

and murder all that came in their way in the night-time. The king took an opportunity from these irregularities to enrich himself. He demanded several loans and free gifts; till at last the Londoners, to prevent further inquiries into their conduct, paid into the exchequer 5000 l. in three years. These disorders, however, were at last stopped by the execution of John Senex; who, though a very rich and reputable citizen, had engaged in these enterprizes. He offered 500 lb. weight of silver, a prodigious sum in those days, for his pardon, but was refused. The king, however, still continued to drain the citizens of their money by free gifts; and at last fined every separate guild, fraternity, or company, that had presumed to act as bodies corporate without the royal letters-patent.

On the death of Henry II. the title of the first magistrate of London was changed from *portreeve* to that of *bailliff*; and in 1189 claimed and acted in the office of the *chief butler* at the coronation of Richard I. In 1191 this monarch permitted the bailliff, named *Henry Fitz Alwine*, to assume the title of *mayor*. For, in 1192, we find certain orders of the mayor and aldermen to prevent fires; whereby it was ordained, that "all houses thereafter to be erected in London and the liberties thereof, should be built of stone, with party-walls of the same; and covered either with slates or tiles, to prevent those dreadful calamities by fire, which were frequently and chiefly occasioned by houses built of wood, and thatched with straw or reeds." And for this purpose it was also provided by the discreeter men of the city, "that 12 aldermen of the city should be chosen in full husting, and there sworn to assist the mayor in appeasing contentions that might arise among neighbours in the city upon inclosure betwixt land and land, and to regulate the dimensions of party-walls, which were to be of stone, 16 feet high, and three feet thick; and to give directions about girders, windows, gutters, and wells." Such confidence also did Richard put in the wisdom and faithfulness of the city of London, that when it was resolved to fix a standard for weights and measures for the whole realm, his majesty committed the execution thereof to the sheriffs of London and Middlesex, whom he commanded to provide measures, gallons, iron rods, and weights for standards, to be sent to the several counties of England. This happened in 1198, at which time corn was advanced to the enormous price of 18. 4d. per quarter.

The city of London was much favoured by king John, who granted them three charters soon after his accession. The first was a recital and confirmation of those granted by Henry I. and II. with the farther privilege of being free from toll and every other duty or custom in his majesty's foreign dominions; for which they paid the sum of 3000 merks. The second was a confirmation of one granted by king Richard. By this the citizens of London had the jurisdiction and conservancy of the river Thames; with a clause to extend that jurisdiction, and the powers therewith granted, to the river Medway; and with another clause to enable the said city, as conservators of the rivers Thames and Medway, to inflict a penalty of 10 l. upon any person that should presume to erect a wear in either of these rivers. The third charter contains a fee-farm-rent of the sherifficks of London and Middlesex.

London.

17  
The office  
of mayor,  
when first  
instituted.

18  
Favours  
granted to  
the city by  
king John.

**London.** Middlesex at the ancient rent, of which they had been deprived by queen Maud; granting them also the additional power of choosing their own sheriffs. This charter was given by way of conveyance from the crown to the citizens for a valuable consideration, by which the sheriffwick became their freehold; and this is the first covenant or conveyance we find on record with the legal terms of *to have and to hold*, which are at this time accounted an essential part in all conveyances of property.

<sup>19</sup>  
**London** profited by Henry III. During the reign of Henry III. the city of London was oppressed in many different ways. In 1218, he exacted a fine of 40 marks for selling a sort of cloth not two yards within the lifts; and a 15th of the citizens personal estates for the enjoyment of their ancient rights and privileges. In 1221, he commanded by proclamation all the foreign merchants to depart the city; which drew 30 marks from the Ancatic company of the *Steelyard*, to have seisin of their guild or hall in Thames-street. But it was the wrestling-match at St Giles's in the fields that brought on their greatest burden. In the year 1221, on St James's day, the citizens of London having carried off the victory from the people of Westminster and other neighbouring villages, the steward of the abbot of Westminster, meditating revenge against the Londoners, proposed another wrestling match with them, and gave a ram for the prize. The citizens resorted to the place at the time appointed; but were unexpectedly assaulted by a great number of armed men, who killed and wounded many, and dispersed the rest. This raised a great commotion in the city. The populace breathed revenge; and, by the instigation of Constantine Fitz-Arnulph, a great favourite of the French party during the troubles in king John's reign, they proceeded to Westminster, and pulled down the houses both of the steward and abbot. Hearing afterwards that the abbot was come into the city with his complaint to Philip Daubney the king's counsel, they pursued him, beat his servants cruelly, took away 12 of his horses, and would have murdered himself, had he not escaped by a back-door. Upon this tumult, Hubert de Bury, then chief justiciary, summoned the mayor and many of the principal citizens to attend him in the tower of London; and inquiring for the authors of the riot, Constantine, the ringleader, boldly answered, that "he was one; that they had done no more than they ought; and that they were resolved to avow what they had done, let the consequence be what it would." In this he was seconded by his nephew and one Geoffrey; but the justiciary, having dismissed all the rest, detained these three, and ordered them to be hanged next morning, though Constantine offered 15,000 marks for his pardon. Hubert then coming into the city with a strong guard, caused the hands and feet of most of the principal rioters he could seize to be cut off; all which was executed without any legal proceedings or form of trial. After these arbitrary cruelties, he degraded the mayor and all the magistrates; placed a *custos* over the city, and obliged 30 persons of his own choosing to become securities for the good behaviour of the whole city. Several thousand marks were also exacted by the king, before he would consent to a reconciliation.

This arbitrary behaviour alarmed the whole nation.

**London.** The parliament of 1224 began to be uneasy for themselves, and addressed his majesty that he would be pleased to confirm the charter of liberties which he had sworn to observe; and the consequence of this application was a confirmation of the magna charta in the full parliament at Westminster in the year 1225. At this time also all the rights and privileges of the citizens were confirmed. They were exempted from prosecutions for burels, *i. e.* lifted-cloth; and were granted the right of having a common seal. The necessities circumstances of this monarchy, however, made him often exact money arbitrarily as long as he lived.

Under the succeeding reigns, as the liberty of the people in general was augmented, so the liberty, opulence, and power of the citizens of London increased, until they became a kind of balance to the power of the crown itself, which in some measure they still continue to be. Riots indeed, for which they generally suffered, were by no means infrequent; the city often suffered by fires, and plagues. Nothing, however, happened which materially affected the welfare of the city, till the reign of Charles II. in 1665.—This year London was ravaged by the most violent plague ever known in Britain, plague in The whole summer had been remarkably still and warm, so that the weather was sometimes suffocating even to people in perfect health; and by this unusual heat and sultry atmosphere, people were undoubtedly prepared for receiving the infection, which appeared with violence in the months of July, August, and September. A violent plague had raged in Holland in the year 1663; on which account the importation of merchandise from that country was prohibited by the British legislature in 1664. Notwithstanding this prohibition, however, it seems the plague had actually been imported; for in the close of the year 1664, two or three persons died suddenly in Westminster, with marks of the plague on their bodies. Some of their neighbours, terrified at the thoughts of their danger, removed into the city; but their removal proved too late for themselves, and fatal to those among whom they came to reside. They soon died of the plague; and communicated the infection to so many others, that it became impossible to extinguish the seeds of it by separating those that were infected from such as were not. It was confined, however, through a hard frosty winter, till the middle of February, when it again appeared in the parish of St Giles's, to which it had been originally brought; and after another long rest till April, shewed its malignant force afresh, as soon as the warmth of the spring gave it opportunity.—At first it took off one here and there, without any certain proof of their having infected each other, and houses began to be shut up, with a design to prevent its spreading. But it was now too late; the infection gained ground every day, and the shutting up of houses only made the diseases spread wider. People, afraid of being shut up, and secluded from all communication with society, concealed their illness, or found means to escape from their places of confinement; while numbers expired in the greatest torments, destitute of every assistance; and many died both of the plague, and other diseases, who would in all probability have recovered, had they been allowed their liberty, with proper exercise and air.—A house was shut up on account of a maid-servant, who had only spots,



London.

spots, and not the gangrenous plague-blotches, upon her, so that her distemper was probably a petechial fever. She recovered; but the people of the house obtained no liberty to stir, either for air or exercise, for 40 days. The bad air, fear, anger, and vexation, attending this injurious treatment, cast the mistress of the family into a fever. The visitors appointed to search the houses, said it was the plague, though the physicians were of a different opinion: the family, however, were obliged to begin their quarantine anew, though it had been almost expired before; and this second confinement affected them so much, that most of the family fell sick, some of one distemper, and some of another. Every illness that appeared in the family produced a fresh prolongation of their confinement; till at last the plague was actually brought in by some of those who came to inquire into the health of the family, and almost every person in the house died.—Many examples of a similar kind happened, and this was one of the worst consequences of shutting up houses. All means of putting a stop to the infection were evidently ineffectual. Multitudes fled into the country; many merchants, owners of ships, &c. shut themselves up, on board their vessels, being supplied with provisions from Greenwich, Woolwich, and single farm-houses on the Kentish side. Here, however, they were safe; for the infection never reached below Deptford, though the people went frequently on shore to the country-towns, villages, and farm-houses, to buy fresh provisions. As the violence of the plague increased, the ships, which had families on board, removed farther off; some went quite out to sea, and then put into such harbours and roads as they could best get at.

In the mean time the distemper made the most rapid advances within the city. In the last week of July, the number of burials amounted to 2010; but the first week of August it rose to 3817; thence to 3880; then to 4237; the next week, to 6102; and at last to 7000 and 8000 weekly. In the last week of September, however, the fury of the disease began to abate; though vast numbers were sick, yet the number of burials decreased from 7155 to 5538; the next week there was a farther decrease to 4929, then to 4327, next to 2605, then to 1421, and the next week to 1031.

All this while, the poor people had been reduced to the greatest distresses, by reason of the stagnation of trade, and the sicknesses to which they were peculiarly liable on account of their manner of living. The rich, however, contributed to their subsistence in a most liberal manner. The sums collected on this occasion are, indeed, almost incredible; being said to amount to 100,000*l.* per week. The king is reported to have contributed 1000*l.* weekly; and in the parish of Cripplegate alone 17,000*l.* was distributed weekly among the poor inhabitants.—By the vigilance also of the magistrates, provisions continued remarkably cheap throughout the whole time of this dreadful calamity, so that all riots and tumults on that account were prevented; and at last, on the cessation of the disease in the winter of 1665, the inhabitants who had fled returned to their habitations, and London to appearance became as populous as ever, though it was computed that 100,000 persons had

been carried off by the plague.

The city was scarcely recovered from the desolation occasioned by the plague, when it was almost totally laid in ashes by a most dreadful fire. This broke out in a baker's shop in Pudding-lane, on Saturday-night, September 2. 1666. In a few hours Billingsgate ward was entirely burnt down; and before morning the fire had crossed Thames-Street, and destroyed the church of St Magnus. From thence it proceeded to the bridge, and consumed a great pile of buildings there; but was stopped by the want of any thing more to destroy. The flames, however, being scattered by a strong east wind, continued their devastation in other quarters. All efforts to stop it proved unsuccessful throughout the Sunday. That day it proceeded up as far as Garlick-hithe; and destroying Canon-street, invaded Cornhill and the exchange. On Monday, the flames having proceeded eastward against the wind through Thames-street, invaded Tower-street, Grace-church-street, Fenchurch-street, Dowgate, Old-fish-street, Watling-street, Thread-needle-street, and several others, from all which it broke at once into Cheapside. In a few hours Cheapside was all in flames, the fire having reached it from so many places at once. The fire then continuing its course from the river on one side, and from Cheapside on the other, surrounded the cathedral of St Paul's. This building flooded by itself at some distance from any houses; yet such was the violence of the flames, and the heat of the atmosphere occasioned by them, that the cathedral took fire at top. The great beams and masonry stones broke through into Faith-church underneath, which was quickly set on fire; after which, the flames invaded Paternoster-row, Newgate-street, the Old Bailey, Ludgate-hill, Fleet-street, Iron-monger-lane, Old-Jury, Laurence-lane, Milk-street, Wood-street, Gutter-lane, Foster-lane, Lothbury, Cateaton-street; and, having destroyed Christ-church, burnt furiously thro' St Martin's Le Grand towards Aldergate.

The fire had now attained its greatest extent, and was several miles in compass. The vast clouds of smoke obscured the sun so, that he either could not be seen at all, or appeared through it as red as blood. The flames reached an immense way up into the air, and their reflection from the smoke, which in the night-time seemed also like flame, made the appearance still more terrible. The atmosphere was illuminated to a great extent, and this illumination is said to have been visible as far as Jedburgh in Scotland. Some of the light ashes also are said to have been carried to the distance of 16 miles. Guildhall exhibited a singular appearance. The oak with which it was built was so solid that it would not flame, but burnt like charcoal, so that the building appeared for several hours like an enchanted palace of gold or burnished brass.

At last, on Wednesday morning, when every one expected that the suburbs as well as the city were to have been burnt, the fire began of itself to abate by reason of the wind having ceased, and some other changes no doubt taking place in the atmosphere. It was checked by the great building in Leaden-hall-street, and in other streets, by the blowing up several houses with gun-powder; and on Thursday the flames were quite extinguished.—The following is a calculation of the damage done by this extraordinary

London.

21  
Account of  
the great  
fire in 1666.

London. conflagration.

|   |   |            |   |   |
|---|---|------------|---|---|
| 22<br>Calculation<br>of the da-<br>mage done, | Thirteen thousand two hundred<br>houses, at 12 years purchase, sup-<br>posing the rent of each 25 l. Ster-<br>ling, | 3,960,000  | o | o |
|   | Eighty-seven parish-churches, at<br>8000 l.   | 696,000    | o | o |
|   | Six consecrated chapels, at 2000l.  | 12,000     | o | o |
|   | The royal exchange  | 50,000     | o | o |
|   | The custom-house  | 10,000     | o | o |
|   | Fifty-two halls of companies, at<br>1500 l. each  | 78,000     | o | o |
|   | Three city-gates at 3000l. each   | 9000       | o | o |
|   | Jail of Newgate   | 15,000     | o | o |
|   | Four stone-bridges  | 6000       | o | o |
|   | Schions-house   | 7000       | o | o |
|   | Guildhall, with the courts and<br>offices belonging to it   | 40,000     | o | o |
|   | Blackwell-hall  | 3000       | o | o |
|   | Bridewell   | 5000       | o | o |
|   | Poultry Compter   | 5000       | o | o |
|   | Woodstreet Compter  | 3000       | o | o |
|   | St Paul's church  | 2,000,000  | o | o |
|   | Wares, household-stuff, money,<br>and moveable-goods lost or spoiled  | 2,000,000  | o | o |
|   | Hire of porters, carts, wag-<br>gons, barges, boats, &c. for re-<br>moving goods                                    | 200,000    | o | o |
|   | Printed books and paper in<br>shops and warehouses  | 150,000    | o | o |
|   | Wine, tobacco, sugar, &c. of<br>which the town was at that time<br>very full  | 1,500,000  | o | o |
|   |   | 10,689,000 | o | o |

It was never certainly known whether this fire was accidental or designed. A suspicion fell upon the Papists; and this gained such general credit, that it is ascribed for a truth on the monument which is erected in memory of the conflagration. Of the truth of this ascription, however, though there was not sufficient proof, it had the effect of making the Papists most violently suspected and abhorred by the Protestants, which some time after proved very prejudicial to the city itself.

From this calamity, great as it was, London soon recovered itself, and became much more magnificent than before; the streets, which were formerly crooked and narrow, being now built wide and spacious; and the industry of its inhabitants repaired the losses they had sustained. In 1679, the city was again alarmed by the discovery of a design to destroy it by fire a second time. Elizabeth Osly, servant to one Rind in Fetter-lane, having let her master's house on fire, was apprehended on suspicion, and confessed, that she had been hired to do it by one Stubbs a Papist, for a reward of 5 l. Stubbs being taken into custody, acknowledged that he had persuaded her to it; and that he himself had been prevailed upon by one father Gifford his confessor, who had assured him, that by burning the houses of heretics he would do a great service to the church. He also owned that he had several conferences with Gifford and two Irishmen on the affair. The maid and Stubbs also agreed in declaring, that the Papists intended to rise in London, expecting

to be powerfully supported by a French army. In consequence of this discovery, the Papists were banished from the city and ten miles round, and five jesuits were hanged for the abovementioned plot.

The Papists thought to revenge themselves, by forcing what was called the *meal-tub plot*, in which the Presbyterians were supposed to hatch treacherous designs against the life of the king. Sir Edmondbury Godfrey also, who had been very active in his proceedings against the Papists, was murdered by some unknown persons; and this murder, together with their discovering the falsehood of the meal-tub plot, so exasperated the Londoners, that they resolved to shew their detestation of Popery by an extraordinary exhibition on the 17th of November, queen Elizabeth's accession to the throne, on which day they had usually burnt the pope in effigy. The procession began with a person on horseback personating Sir Edmondbury Godfrey, attended by a bell-man proclaiming his execrable murder. He was followed by a person carrying a large silver-crofs, with priests in copes, Carmelites, and Gray-friars, followed by six jesuits: then proceeded divers waiters, and after them some bishops with lawn-sleeves, and others with copes and mitres. Six cardinals preceded the pope, enthroned in a stately pageant, attended by divers boys with pots of incense, and the devil whispering in his ear. In this order they marched from Bishopgate to Fleet-street; and there, amidst a great multitude of spectators, committed his holiness to the flames.

This procession gave great offence to the court, at which the duke of York, afterwards James II. had a great influence. The breach was farther widened by the choice of sheriffs for that year. The candidates set up for the court were rejected by a majority of almost two to one; but this did not deter their party from demanding a poll in their behalf, upon which a tumult ensued. This was represented by the Popish party in such colours to the king, that he issued out a commission that same evening for trying the rioters; which, however, was so far from intimidating the rest, that they grew more and more determined, not only to oppose the Popish party, but to exclude the duke of York from his succession to the crown.

In the mean time, the king prorogued the parliament, to prevent them from proceeding in their inquiry concerning the Popish plot, and the exclusion-bill. Upon this the lord-mayor, aldermen, and common-council, presented a petition to his majesty, in which they requested, that he would permit the parliament to sit in order to complete their salutary measures and councils. This petition was highly resented by the king; who, instead of granting it, dissolved the parliament, and could never afterwards be reconciled to the city. From this time it was determined to seize their charter; and fresh provocations having been given about the election of sheriffs, a *quo warranto* was at last produced by the attorney-general, in order to overthrow their charter, and thereby to deprive the citizens of the power to choose sheriffs. This information set forth, That "the mayor and commonalty and citizens of the city of London, by the space of a month then last past and more, used, and yet do claim to have and use, without any lawful warrant or regal grant, within the city of London aforesaid,

London.

24

Which gives occasion to a quarrel with the court.

25

A *quo warranto* granted against the city.

23  
A design to set it on fire again.

London.

faid, and the liberties and privileges of the fame city, the liberties and privileges following, viz.

" 1. To be of themselves a body corporate and politic, by the name of *mayor and commonalty and citizens of the city of London*.

" 2. To have sheriffs *civitat. et coram London. & com. Middlesex*, and to name, make, elect, and constitute them.

" 3. That the mayor and aldermen of the said city should be justices of the peace, and hold sessions of the peace.

All which liberties, privileges, and franchises, the said mayor and commonalty, and citizens of London, upon the king did by the space aforesaid usurp, and yet do usurp."

Though nothing could be more unjust than this prosecution, the ministry were determined at all events to crush the Londoners; rightly judging, that it would be an easy matter to make all other corporations surrender their charters into the king's hands, and that they had no other body in the nation to fear. Accordingly they displaced such judges as would not approve of their proceedings; and, on the 12th of June 1683, Justice Jones pronounced the following sentence: "That a city might forfeit its charter; that the malversations of the common-council were acts of the whole city; and that the points set forth in the pleadings were just grounds for the forfeiting of a charter."

Notwithstanding this sentence, however, the attorney-general, contrary to the usual custom in such cases, was directed to move that the judgment might not be recorded; being afraid of the consequences. Yet it was judged that the king might seize the liberties of the city. A common-council was immediately summoned to deliberate on this exigency. The country party moved to have the judgment entered; but they were over-ruled by the court-party, who insisted upon an absolute submission to the king before judgment was entered: and though this was in effect a voluntary surrender of the city-liberties, and depriving themselves of the means of getting the judgment reversed, the act of submission was carried by a great majority: and in a petition from the lord-mayor, aldermen, and common-council, they "acknowledged their own misgovernment, and his majesty's lenity; begged his pardon, and promised constant loyalty and obedience; and humbly begged his majesty's commands and directions." To this his majesty answered, that he would not reject their suit, if they would agree upon the following particulars.

1. That no lord-mayor, sheriff, recorder, common sergeant, town-clerk, or coroner, of the city of London, or steward of the borough of Southwark, shall be capable of, or admitted to, the exercise of their respective offices before his majesty shall have approved of them under his sign manual.

2. That if his majesty shall disapprove the choice of any person to be lord mayor, and signify the same under his sign manual to the lord mayor, or, in default of a lord mayor, to the recorder or senior alderman, the citizens shall, within one week, proceed to a new choice: and if his majesty shall in like manner disapprove the second choice, his majesty may, if he please, nominate a person to be lord-mayor for the

year ensuing.

3. If his majesty shall, in like manner, disapprove the persons chosen to be sheriffs, or either of them, his majesty may appoint sheriffs for the year ensuing.

4. That the lord-mayor and court of aldermen may, with the leave of his majesty, displace any alderman, recorder, &c.

5. Upon the election of an alderman, if the court of aldermen shall judge and declare the person present to be unfit, the ward shall choose again; and upon a disapproval of a second choice, the court may appoint another in his room.

6. That the justices of the peace should be by the king's commission; and the settling of those matters to be left to his majesty's attorney-general, and council learned in the law.

To these the lord keeper added in the king's name, "That these regulations being made, his majesty would not only pardon this prosecution, but would confirm their charter in such a manner as should be consistent with them;" concluding thus: "My lord mayor, the term draws towards an end, and midsummer-day is at hand, when some of the officers used to be chosen; whereof his majesty will reserve the approbation. Therefore, it is his majesty's pleasure, that you return to the city, and consult the common-council, that he may speedily know your resolutions thereupon, and accordingly give his directions. That you may see the king is in earnest, and the matter is not capable of delay, I am commanded to let you know he hath given orders to his attorney-general to enter upon judgment on Saturday next; unless you prevent it by your compliance in all these particulars."

A common-council was summoned, when the friends of liberty treated those slavish conditions as they deserved; and even declared, that they were ready to sacrifice all that was near or dear to them, rather than submit to such arbitrary impositions: but when it was put to the vote, there appeared a majority of 18 for submission.

Thus the king got the government of the city into his own hands, though he and his brother entirely lost the affections of the Londoners. But, not content with their submission, his majesty departed from his promise; commanded the judgment upon the *quo warranto* to be entered; and commissioned Sir William Pritchard, the lord mayor, to hold the same office during his majesty's pleasure. In the same manner he appointed or displaced the other magistrates as he thought proper; after which the ministry, having nothing to fear, proceeded in the most arbitrary manner.

In this subjection to the will of the court, the city of London continued till the revolution: but, in 1689, the immediate restoration of the Londoners to their franchises was ordered; and in such a manner and form, as to put it out of the powers of an arbitrary ministry and a corrupt judge and jury to deprive them of their chartered liberties for the time to come. Accordingly a bill was brought into parliament, and passed, for reversing the judgment of the *quo warranto* against the city of London, and for restoring the same to its ancient rights and privileges. Since that time the city of London hath enjoyed tranquillity; its commerce hath been carried to the highest pitch; and for the politeness, riches,

London.

25  
Conditions  
of reconcili-  
ation betw-  
the king and  
city.

26  
The king  
breaks his  
promise.

27

Privileges  
of the city  
restored.



London. riches, and number of its inhabitants, as well as its extent and the magnificence of its buildings, is inferior to no city in Europe.

28  
Description  
of the city. London stands on a spot where the Thames is formed into a half-moon, and at the distance of 60 miles by water from the mouth of the river, but where the flux and reflux of the tide is very perceptible. But the part particularly distinguishing by the name of the *city of London*, stands on the north shore from the Tower to the Temple, and is covered from the cold north winds by the hills of Hampstead and Highgate. In its present extent, it has included one city, one borough, and 49 villages. For within it we find the city of Westminster, the borough of South-wark and the villages of Mora, Finsbury, Wenlexbarn, Clerkenwell, Islington, Hoxton, Shoreditch, Norton-falgate, the Spital, Whitechapel, Mile-end new town, Mile-end old town, Bethnal Green, Stepney, Bow, Bromley, Blackwall, Poplar, Limehouse, Ratcliff, Shadwell, Wapping-Stepney, Wapping, East-Smithfield, Hermitage, St Catherine's, the Minories, St Clement's Danes, the Strand, Charing-croft, St James's, Knightbridge, Marybone, Soho, St Giles's in the fields, St Martins in the fields, Bloomsbury, Port-pool, Saffron-hill, Holborn. And on the south-side of the Thames are Vauxhall, Lambeth, Lambeth-marsh, Kennington, Newington-Butts, Bermondsey, the Grange, Horsley Down, and Rotherhithe; beyond which, a very little to the eastward, stand the two villages of Deptford and Greenwich, the former of which contains between 1800 and 1900 houses, and the latter between 1300 and 1400, each of them excelling the capitals of three or four foreign princes put together, both in number of houses, inhabitants, and riches. The length of the ground on which all these buildings stand is seven miles and a half and 176 yards, its breadth three miles 170 yards and an half.

By the *city of London*, we are to understand no more than that part formerly encompassed by the wall, which in circumference measures only three miles and 165 feet. In this wall there were eight gates: but the wall hath long since been pulled down to make way for new buildings in several places; and there is now left standing only one of the city-gates called *New-gate*, the others being removed to widen the streets, and to make the avenues to the city more commodious and airy. The liberties, or those parts of this great city which are subject to its jurisdiction, and lie without the walls of London, are bounded on the east, in White-chapel, the Minories, and Bishopsgate, by bars, which were formerly polls and chains, that were frequently taken away by arbitrary power, when it was thought proper to seize the franchises of the city of London: on the north, they are bounded in the same manner in Pick-ax street, at the end of Fan-alley, and in St John's street: on the west, by bars in Holborn: at the east end of Middle Row, and at the west end of Fleet-street, by the gate called *Temple-bar*: on the south, we may include the jurisdiction which the city holds on the river Thames, and over the borough of Southwark, to which the city of London has an undoubted right by charter, and for which they paid a valuable consideration to king Edward VI. and which was confirmed to them by the 2d of William & Mary, c. 8.—The city is at present divided into 26 wards.

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1. *Aldersgate ward* takes its name from a city-gate London. which lately stood in the neighbourhood. It is bounded on the east by Cripplegate ward; on the west, by Farringdon ward within and without; and on the south, by Farringdon ward within. It is very large, and is divided into Aldersgate-within and Aldersgate-without. Each of these divisions consists of four precincts, under one alderman, eight common-council men, of whom two are the alderman's deputies, eight constables, fourteen inquest-men, eight scavengers, and a beadle; exclusive of the officers belonging to the liberty of St Martin's le Grand, which contains 168 houses.

2. *Aldgate* takes its name also from a gate, which was of great antiquity, being mentioned in king Edgar's charter to the knights of the Knighton guild about the year 967; and was probably of a much more ancient foundation, for it was the gate through which the Roman Vicinal way lay to the ferry at Oldford. It was pulled down some years ago by parliamentary authority, at the petition of the corporation.—The ward of Aldgate is bounded on the east by the city-wall, which divides it from Portoken-ward; on the north, by Bishopsgate ward; on the west, by Lime-street and Langborn wards; and on the south, by Tower-street ward. It is governed by an alderman, six common-council men, six constables, twenty inquest-men, seven scavengers, and a beadle; besides the officers belonging to St James's, Duke's Place.—It is divided into seven precincts.

3. *Basilbar or Basinghall ward*, is bounded on the east and south by Coleman-street ward, on the north by part of Cripplegate, and on the west by part of the wards of Cheap and Cripplegate. On the south, it begins at Blackwell-hall; and runs northward to London-wall, pulled down some time ago to make way for new buildings in *Fore-street*, and spreads 88 feet east, and 54 feet west against the place where that wall stood. This is a very small ward, and consists only of two precincts: the upper precinct contains no more than 66, and the lower only 76 houses. It is governed by an alderman, four common-council men, of whom one is the alderman's deputy, three constables, seventeen inquest-men, three scavengers, and a beadle. It has its name from Basinghall the mansion-house of the family of *Basing*, which was the principal house in it, and stood in the place of Blackwell-hall.

4. *Billinggate ward* is bounded on the east by Tower-street ward; on the north, by Langbourn ward; on the west, by the ward of Bridge-within; and on the south, by the river Thames. It is divided into 12 precincts; and is governed by an alderman, 10 common-councilmen, one of whom is the alderman's deputy, 11 constables, 14 inquest-men, six scavengers, and a beadle. The origin of its name is unknown. Its situation on the river gives it great advantages with respect to trade and merchandize; so that it is well inhabited, and is in a continual hurry of business at the several wharfs or quays.

5. *Bishopsgate ward* is bounded on the east by Aldgate ward, Portoken ward, and part of the Tower-liberty, or Norton-falgate; on the west, by Broad-street ward and Moorfields; and on the south, by Langbourn ward. It is very large, and divided into Bishopsgate-

24 H within,

6. *Bread-street ward* is encompassed on the north and north-west, by the ward of Farringdon-within; on the east, by Cordwainer's ward; on the south by Queenhithe ward; and on the west, by Castle-Baynard ward. It is divided into 13 precincts; and is governed by an alderman, 12 common-council men, of whom one is the alderman's deputy, 13 constables, 13 inquest-men, 13 scavengers, and a beadle; and yet contains no more than 331 houses. It takes its name from the ancient bread-market, which was kept in the place now called *Bread-street*; the bakers being obliged to sell their bread only in the open market, and not in shops.

7. *Bridge-ward within* is bounded on the south by the river Thames and Southwark; on the north, by Langbourn and Bishopgate ward; on the east, by Billingsgate; and on the west, by Candlewick and Dowgate wards. It is divided into 14 precincts, three of which were on London-bridge; and is governed by an alderman, 15 common-council men, one of whom is the alderman's deputy, 14 constables, 15 inquest-men, 14 scavengers, and a beadle. It takes its name from its connection with London-bridge.

8. *Broad-street ward* is bounded on the north and east, by Bishopgate ward; on the south, by Cornhill and Wallbrook ward; and on the west by Coleman-street ward. It is divided into 10 precincts; and governed by an alderman, 10 common-council men, one of whom is the alderman's deputy, 10 constables, 13 inquest-men, eight scavengers, and a beadle. It has its name from that part of it now distinguished by the name of *Old Broad-street*; and which, before the fire of 1666, was accounted one of the broadest streets in London.

9. *Candlewick-ward, Candlewick-street, or Candle-wright-street ward*, as it is called in some ancient records, is bounded on the east by Bridge ward; on the south, by Dowgate, and part of Bridge ward; on the west, by Dowgate and Wallbrook; and on the north, by Langbourn ward. It is but a small ward, consisting of about 286 houses; yet is divided into seven precincts. It is governed by an alderman, eight common-council men, of whom one is the alderman's deputy, seven constables, 13 inquest-men, seven scavengers, and a beadle. It has its name from a street formerly inhabited chiefly by candle-wrights or candle-makers, both in tallow and wax; a very profitable business in the times of Popery, when incredible quantities of wax-candles were consumed in the churches. That street, however, or at least its name, *Candlewick*, is lost since the great conflagration, for which the name *Canon-street* is substituted, the candle-wrights being at that time burnt out and dispersed through the city.

10. *Castle-Baynard ward* is bounded by Queen-

hithe and Bread-street wards on the east; on the south, by the Thames; and on the west and north, by the ward of Farringdon-within. It is divided into 10 precincts, under the government of an alderman, 10 common-council men, one of whom is the alderman's deputy, nine constables, 14 inquest-men, seven scavengers, and a beadle. It takes its name from a castle built on the bank of the river by one Baynard, a soldier of fortune, who came in with William the Conqueror, and was by that monarch raised to great honours and authority.

11. *Cheap ward* is bounded on the east by Broad-street and Wallbrook wards; on the north, by Coleman-street, Bassishaw, and Cripple-gate; and on the south, by Cordwainer's ward. It is divided into nine precincts; and is governed by an alderman, 12 common-council men, of whom one is the alderman's deputy, 11 constables, 13 inquest-men, nine scavengers, and a beadle. It has its name from the Saxon word *chepe*, which signifies a market, kept in this division of the city, now called *Cheapside*; but then known by the name of *Westsheap*, to distinguish it from the market then also kept in Eastcheap, between Canon or Candlewick street and Tower-street.

12. *Coleman street ward* is bounded on the east by Bishopgate, Broadstreet, and Cheap wards; on the north, by Cripple-gate ward, Middle Moorfields, and Bishopgate; on the south, by Cheap ward; and on the west, by Bassishaw ward. It is divided into six precincts; and is governed by an alderman, six common-council men, one of whom is the alderman's deputy, six constables, 13 inquest-men, six scavengers, and a beadle. The origin of the name is not certainly known.

13. *Cordwainer's ward* is bounded on the east by Wallbrook, on the south by Vintry ward, on the west by Bread-street, and on the north by Cheap ward. It is divided into eight precincts; and is governed by an alderman, eight common-council men, one of whom is the alderman's deputy, eight constables, 14 inquest men, eight scavengers, and a beadle. Its proper name is *Cordwainers-street-ward*; which it has from Cordwainers-street, now Bow-lane, formerly occupied chiefly by shoemakers and others that dealt or worked in leather.

14. *Cornhill ward* is but of small extent. It is bounded on the east by Bishopgate, on the north by Broadstreet, on the west by Cheap ward, and on the south by Langbourn ward. It is divided into four precincts, which are governed by one alderman, six common-council men, of whom one is the alderman's deputy, four constables, 16 inquest-men, four scavengers, and a beadle. It takes its name from the principal street in it, known from the earliest ages by the name of *Cornhill*, because the corn-market was kept there.

15. *Cripple-gate ward* is bounded on the east by Moorfields, Coleman-street ward, Bassishaw ward, and Cheap-ward; on the north, by the parish of St Luke's, Old-street; on the west, by Aldersgate ward; and on the south, by Cheap ward. It is divided into 13 precincts, nine within and four without the wall; and is governed by an alderman, 12 common-council men, of whom two are the alderman's deputies, 13 constables, 34 inquest-men, 16 scavengers, and three beadle. It takes

London. takes its name from *Cripplegate*, which stood on the north-west part of the city wall. It was an old plain structure, void of all ornament, with one postern; but had more the appearance of a fortification than any of the other gates. It was removed in order to widen the entrance into Wood-street, which, by the narrowness of the gateway was too much contracted and rendered dangerous for passengers and great wag-gons.

16. *Dowgate ward* is bounded on the east by Candle-wick and Bridge wards, on the north by Wallbrook ward, on the west by Vintry ward, and on the south by the Thames. It is divided into eight precincts, under the government of an alderman, eight common-council men, of whom one is the alderman's deputy, eight constables, 15 inquest-men, five scavengers, and a beadle. It has its name from the ancient water-gate, called *Dowgate*, which was made in the original wall that ran along the north-side of the Thames, for the security of the city against all attempts to invade it by water.

17. *Farringdon ward within* is bounded on the east by Cheap ward and Baynard-castle ward; on the north, by Aldergate and Cripplegate wards, and the liberty of St Martin's le Grand; on the west, by Farringdon-without; and on the south, by Baynard-castle ward, and the river Thames. It is divided into 18 precincts; and governed by one alderman, 17 common-council men, of whom one is the alderman's deputy, 19 constables, 17 inquest-men, 19 scavengers, and two beadles. It takes its name from William Farringdon citizen and goldsmith of London, who, in 1279, purchased all the aldermanry with the appurtenances, within the city of London and suburbs of the same, between Ludgate and Newgate, and also *without* these gates.

18. *Farringdon ward without* is bounded on the east by *Farringdon-within*, the precinct of the late priory of St Bartholomew near Smithfield, and the ward of Aldergate; on the north, by the charter-house, the parish of St John's Clerkenwell, and part of St Andrew's parish without the freedom; on the west, by High Holborn, and St Clement's parish in the Strand; and on the south, by the river Thames. It is governed by one alderman, 16 common-council-men, of whom two are the alderman's deputies, 23 constables, 48 inquest-men; 24 scavengers; and four beadles. It takes its name from the same goldsmith who gave name to Farringdon-within.

19. *Langborn ward* is bounded on the east by Ald-gate ward; on the north, by part of the same, and Lime-street ward; on the south, by Tower-street, Bill-ingsgate, Bridge, and Candlewick wards; and on the west by Wall brook. It is divided into 12 precincts. It had its name from a rivulet or long bourn of fresh-water, which anciently flowed from a spring near Mag-pye alley adjoining to St Catherine Coleman's church.

20. *Lime-street ward* is bounded on the east and north by Aldgate ward, on the west by Bishopsgate; and on the south by Langbourn ward. It is divided into four precincts; and governed by an alderman, four common councilmen, one of whom is the alderman's deputy, four constables, 13 inquest men, four scavengers, and a beadle. It is very small; and has its name from some lime-kilns that were formerly built in or

near Lime-street.

21. *Portoken ward* is bounded on the east by the parishes of Spitalfields, Stepney, and St George's in the east; on the south, by Tower hill; on the north, by Bishopsgate ward, and on the west by Aldgate ward. It is divided into five precincts; and is gov-erned by an alderman, five common-council men, one of whom is the alderman's deputy, five constables, 19 inquest-men, five scavengers, and a beadle. Its name signifies the *franchise of the liberty gate*. This Portoken was for some time a guild; and had its beginning in king Edgar, when 13 knights, "well-beloved of the king and realm, for services by them done," requested to have a certain portion of land on the east part of the city, left desolate and forsaken of the inhabitants by reason of too much servitude. They besought the king to have this land, with the liberty of a guild for ever. The king granted their request on the following condi-tions, viz. that each of them should victoriously accom-plish three combats, one above the ground, one under ground, and the third in the water; and after this, at a certain day, in East Smithfield, they should run with spears against all comers. All this was gloriously per-formed; upon which the king named it *Knights Guild*, and extended it from Aldgate to the places where the bars now are on the east, and to the Thames on the south, and as far into the water as an horseman could ride at low water and throw his spear.

22. *Queen-hithe ward* is bounded on the east by Dowgate, on the north by Bread-street and Cord-wainer's wards, on the south by the Thames, and on the west by Castle-Baynard ward. It is divided into nine precincts; and is governed by one alderman, six com-mon-councilmen, one of whom is the alderman's depu-ty, and nine constables. It has its name from the *hithe*, or harbour for large boats, barges, and lighters; for which, and even for ships, it was the anchoring place, and the key for lading and unloading vessels almost of any burden used in ancient times. It has the name of *queen*, because the queens of England usually possessed the tolls and customs of vessels that unloaded goods at this *hithe*, which were very considerable.

23. *Tower ward, or Tower-street ward*, is bounded on the south by the river Thames, on the east by Tower-hill and Aldgate ward, on the north by Lang-bourn ward, and on the west by Billingsgate ward. It is governed by one alderman, 12 common-council men, of whom one is the alderman's deputy, 12 constables, 13 inquest-men, 12 scavengers, and one beadle. It takes its name from *Tower-street*, so called because it leads out of the city in a direct line to the principal en-trance of the Tower of London.

24. *Vintry ward* is bounded on the east by Dow-gate, on the south by the Thames, on the west by Queen-hithe ward, and on the north by Cordwainers ward. It is a small ward, containing only 418 houses; but is divided into nine precincts, and governed by an alderman, nine common-council men, one of whom is the alderman's deputy, nine constables, 13 inquest-men, three scavengers, and a beadle. It takes its name from the vintners or wine-merchants of Bour-deaux, who formerly dwelt in this part of the ci-ty, were obliged to land their wines on this spot, and to sell them in 40 days, till the 28th of Ed-ward I.

London.



London.

London.

25. *Wall brook ward* is bounded on the east by Langbourn, on the south by Dowgate ward, on the west by Cordwainers ward, and on the north by Cheap ward. It is small, containing only 306 houses; but is divided into seven precincts, and governed by an alderman, eight common-council men, of whom one is the alderman's deputy, seven constables, 13 inquest-men, six scavengers, and a beadle. It has its name from the rivulet *Wall-brook*, that ran down the street of this name into the river Thames near Dowgate; but in process of time it was so lost by covering it with bridges, and buildings upon those bridges, that its channel became a common sewer.

26. The ward of *Bridge without* includes the borough of Southwark, and the parishes of Rotherhithe, Newington, and Lambeth. It has its name from London-bridge, with the addition of the word *without*, because the bridge must be passed in order to come at it. This borough was incorporated in 1327. At this time, the citizens finding themselves greatly infested by felons, thieves, and disturbers of the peace, who escaped to and took shelter in Southwark, petitioned King Edward III. and his parliament for a grant of jurisdiction over the said village of Southwark: and their petition appeared so just, that his majesty, with consent of his parliament, granted to the said citizens, for himself and his heirs, the said village of Southwark, with the appurtenances, to have and to hold, to them and their heirs and successors, citizens of the said city, of the crown for ever, paying at the exchequer the farms due and accustomed. This ward is governed in a manner similar to the others. However, the magistracy of London seem to have adopted this ward only as a *secure* for the senior alderman for the time being; and thus neglecting the interests of Southwark, the justices of the county of Surry at last encroached so far upon the rights of the city of London as to contend with the citizens concerning their jurisdiction within the borough.

Of the many public buildings worthy of notice about London, the following are selected as the most remarkable.

1. *The Tower.* This building was at first designed as a fortress, and most probably erected in the time of the Romans. It was enlarged and strengthened by William the Conqueror, who garrisoned it with some of his best Norman troops, in order to keep the city in awe. In 1079, he built an addition to it, called the *White Tower*, on account of the colour of the stones with which it was constructed: and this being much damaged by an hurricane in 1093, repairs became necessary; at which time a new foundation was laid for a castle under the south side of the white tower, which was castellated round at a great expence, but not finished till the reign of Henry I. It is indeed perhaps the best chosen situation for a fortress of any in the world. It lies to the eastward of the city, but sufficiently near to preserve it from any invasion by water; being only 800 yards from the bridge; and to the north of the river Thames, from which it is parted by a narrow ditch and a convenient wharf. With the latter it communicates by a draw-bridge, for the readier issuing and receiving ammunition and military stores. On this wharf there is a long and beautiful platform, on which are planted 61 pieces of cannon, mounted on new and very elegant iron-carriages. They are chiefly used on

days of state and for proclaiming any good news to the public. Parallel to the wharf, within the walls, is a platform 70 yards in length, called the *Ladies Line*, because much frequented by the ladies in the summer; it being shaded in the inside with a row of lofty trees, and without it is a delightful prospect of the shipping with boats passing and repassing on the river Thames. You ascend this line by stone steps, and being once upon it you may walk almost round the walls of the tower without interruption.

The principal entrance into the tower is by a gate to the west, large enough to admit coaches and heavy carriages; but these are first admitted through an outward gate, situated without the ditch upon the hill, and must pass a stout stone bridge built over the ditch before they can approach the main entrance. There is, besides, an entrance near the very south-west corner of the Tower outward wall, for persons on foot, over the draw-bridge already mentioned, to the wharf. There is also a water-gate, commonly called *Traitor's gate*, through which it has been customary to convey traitors and other false-prisoners to or from the Tower, and which is seldom opened on any other occasion; but the lords committed to the Tower in 1746 were publicly admitted at the main entrance. Over this gate is a regular building, terminated at each end by two round towers, on which are embrasures for pointing cannon. In this building there are the infirmary, the mill, and the water-works that supply the tower with water.

The white tower is a large square irregular building, situated almost in the centre, no one side answering to another; nor are any of its watch-towers, of which there are four that ornament the top, built alike: one of these towers is now converted into an observatory, and seems very well situated for the purpose. The building itself consists of three very lofty stories; under which are most spacious and commodious vaults, chiefly filled with salt-petre. It is covered at top with flat leads, from whence there is an extensive and delightful prospect. For a more particular description of the tower and the curiosities contained in it, see the article *TOWER of London*.

2. *The Royal Exchange* was founded in the year 1566. Sir Thomas Gresham, merchant in London, made an offer to the lord mayor and citizens, to build at his own expence, a commodious edifice for merchants to meet and transact business, provided the city would find him a convenient situation for the same. The citizens accordingly purchased, for the sum of 3532l. 8s houses in the two alleys called *New St Christophers*, and *Swan-alley*, leading out of Cornhill into Threadneedle street. The materials of those houses were sold for 478l. and the ground, when cleared, was conveyed to Sir Thomas Gresham, who, accompanied by several aldermen, laid the first brick of the new building on the 7th of June that year. Each alderman also laid his brick, and left a piece of gold for the workmen; who set about it with such assiduity and resolution, that the whole fabric was roofed by the month of November 1567, and was soon after completed under the name of the *Burse*. Sir Thomas, by his will dated the 26th of November 1579, devised this stately fabric to the mayor and citizens of London and the company of mercers, to be equally enjoyed and possessed by them, with all its appurtenances and the profits arising there-  
by,

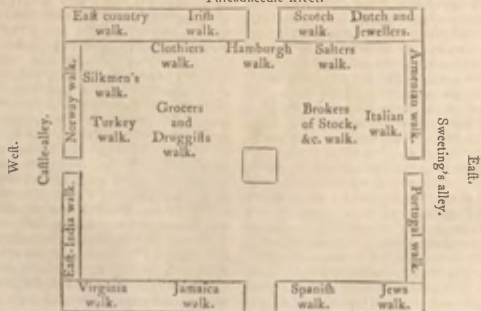
London. by, on condition that the citizens out of their moiety should pay a salary of 50 l. per annum each to four lecturers, to read lectures in divinity, astronomy, music, and geometry, in his mansion-house, *vis.* Gresham-college: and to pay 6 l. 13 s. 4 d. per annum each, to eight alms-people, situate behind the said college, in Broadstreet; and 10 l. yearly to each of the prisoners of Newgate, Ludgate, King's-bench, Marshalsea, and Woodstreet Compter: And that the merchants out of their moiety should pay 50 l. each per annum, to three lecturers to read lectures in law, physic, and rhetoric, in his mansion-house; and 100 l. per annum for four quarterly dinners at their own hall, for the entertainment of the whole company; and 10 l. yearly to Christ's, St Bartholomew's, Bethlehem, and St Thomas's hospitals. The same sum was also to be paid annually to the Spital, and to the Poultry Compter. This building was totally destroyed by the fire in 1666; and in its place the present magnificent structure was erected at the expence of 80,000 l. which stands upon a plat of ground 203 feet in length and 171 in breadth, containing an area in the middle, of 61 square perches, surrounded with a substantial and regular stone building, wrought in rustic. It has two fronts, north and south, each of which is a piazza; and in the centre are the grand entrances into the area, under a very lofty and noble arch. The south front in Cornhill is the principal; on each side of which are Corinthian demi-columns, supporting a compass pediment; and, in the intercolumniation on each side, in the front next the street, is a niche, with the statues of king Charles I. and II. in Roman habits, and well executed. Over the aperture, on the cornice between the two pediments, are the king's arms in relief: on each side of this entrance is a range of windows placed between demi-columns, and pilasters of the composite order, above which runs a balustrade. This building is 56 feet high: and from the centre, in this front, rises a lantern and turret 178 feet high, on the top of which is a fan of gilt brass made in the shape of a grasshopper, the crest of Sir Thomas Gresham's arms. The north front in Threadneedle-street is adorned with pilasters of the com-

posite order; but has neither columns nor statues on the outside; and has a triangular, instead of compass, pediments. The inside of the area is also surrounded with piazzas, forming ambulatories for merchants, &c. to shelter themselves from the weather, when met there upon business. Above the arches of this piazza is an entablature with curious ornaments; and on the cornice a range of pilasters with an entablature extending round, and a compass pediment in the middle of the cornice of each of the four sides. Under the pediment on the north side are the king's arms; on the south, the city's arms; on the east, Sir Thomas Gresham's arms; and on the west, the mercer's arms, with their respective enrichments. In these intercolumns are 24 niches, 20 of which are filled with the statues of the kings and queens of England. Under these piazzas, within the area, are 28 niches, all vacant but that in which Sir Thomas Gresham's statue is placed in the north-west angle, and that in the south-west, where the statue of Sir John Barnard was placed in his lifetime by his fellow-citizens to express their sense of his merit. The centre of this area also is ornamented with a statue of king Charles II. in a Roman habit, standing upon a marble pedestal about eight feet high, and encompassed with iron rails; which pedestal is enriched on the south side with an imperial crown, a sceptre, sword, palm-branches, and other decorations, with a very flattering inscription to the king. On the west side is a cupid cut in relief, resting his right hand on a shield with the arms of France and England quartered, and holding a rose in his left hand. On the north side is another cupid supporting a shield with the arms of Ireland; and on the east-side are the arms of Scotland, with a cupid holding a thistle; all done in relief: the whole executed by that able statuary Mr Gibbon.

In this area, merchants, and such as have business with them, meet every day between twelve at noon and three in the afternoon: and for the more regular and readier dispatch of business, they dispose of themselves into separate walks, according to the following plan.

North.

Threadneedle-street.



South.

In

London.

In building this expensive structure there was an eye not only to magnificence, and to accommodate the merchants, but also to reimburse the expence. For this reason a gallery was built over the four sides of the royal exchange. This was divided into 200 shops, which were let out to haberdashers, milliners, &c. and which for several years were well occupied. But these shops have now for a long time been deserted, and the galleries are let out to the Royal Exchange assurance office, the merchant-seamens office, the Marine society, and to auctioneers, &c. Under the whole area there are the finest dry vaults that can be found any where, which are let out to the East India company to deposit their pepper. In the turret is a good clock with four dials, which is well regulated every day, so that it becomes a standard of time to all the mercantile part of the town; and it goes with chimes at three, six, nine, and twelve o'clock, playing upon twelve bells. The outside of this grand fabric suffers very much in its elegance from the shops that surround it, and are built within its walls; and which are occupied by bookellers, toy-men, cutlers, hosiery, watch-makers, &c.

3. *St Paul's cathedral* is said by some to have been founded on that very spot where formerly stood a temple dedicated to the heathen goddess Diana. This, however, is refuted by Mr Entick, "Because (says he) there must have been found ox-skulls, horns of stags, and tusks of boars, used in sacrifices to that goddess, in the earth about her temple. But Sir Christopher Wren, who had more opportunity than any other person to discover the bowels of the earth, in digging the foundation of St Paul's as it now stands, declares that he found no indications to support such a tradition; but adds, that it was manifest the north side of this ground had been anciently a great burying-place; because he found, under the graves of the latter ages, in a row below them, the burial-places of the Saxon people, who were accustomed to line their graves with chalk-stones, or to be buried in coffins hewn out of the solid stone: and, in a row below the Saxons, he met with British graves. In these last were found ivory and wooden pins, the latter made of box or other hard wood, about six inches long, and in great numbers, which were used to pin up the corpse in a woollen shroud. And in the same row, but deeper, were Roman urns intermixed: this burial-place was upwards of 18 feet deep, and belonged to the colony of London, when the Romans and Britons lived together. The surveyor's curiosity led him deeper; and upon searching for the natural ground below these graves, he discovered that the foundation of the old church stood upon a layer of very close and hard pot-earth. Then he dug wells in different places; and found that this pot-earth on the north-side of the church-yard was about six feet thick or more, but thinner and thinner towards the south, till it decreased to scarce four feet at the declining of the hill, under which he found nothing but dry sand, mixed sometimes unequally, but loose, so that it would run through the fingers. Thence he dug down to the level of low-water-mark; where he met with water and sand, mixed with periwinkles and other sea-shells. He continued boring, till he first came to a hard beach, and under that to the natural hard clay, upon which the city, country, and river of Thames, are founded:

whence he drew this inference, That the sea, or current of the river, had been where now the hill is, on which the cathedral of St Paul's stands. For which Sir Christopher accounted in this manner: "The whole country between Camberwell hill and the hills of Essex, (says he), might have been a great frith or sinus of the sea, and much wider near the mouth of the Thames; which made a large plain of sand at low-water, through which the river found its way: but at low-water, in the summer-season, when the sun dried the surface of the sand, and strong wind happened at the same time, before the flood came on, the sands would dry with the winds, and raise heaps, which in time increased to large and lofty sand-hills, such as those raised in the same manner on the coasts of France and Flanders. For sands are known, upon a conjuncture of sunshine and wind, to drive into visible clouds; and this might be the effect many ages before history, without having recourse to the flood. The sand hill at St Paul's, in the time of the Roman colony, was about 12 feet lower than the present surface thereof; and the river-sand, easily driven with the wind, lay uppermost, and the hard coat of the earth might be thus made. For, pot-earth dissolved in water, and viewed by a microscope, is but impalpable sand, which with the fire will vitrefy."

The cathedral was finished in a very magnificent manner about the year 610, in the reign of Ethelbert king of Kent. It is, however, supposed to have been at first built only of wood; for it was accidentally burnt in 601, and re-built again the same year. A similar disaster befel it in the year 1086, when a considerable part of the city shared the same fate. However, such was the activity of Maurice bishop of London, and such the devotion of the people to the apostle Paul, that the cathedral was rebuilt in a much more magnificent manner than any structure applied to the purposes of devotion had ever been in England before. Maurice obtained a grant of the materials found in the ruins of a tower, called the *great palatine tower*, near Fleet-ditch, which had been burnt down at the same time, to help forward St Paul's. But the good bishop had planned this cathedral so extensively, that he was obliged to leave the finishing of it to posterity; though he prosecuted the work with the greatest diligence for 20 years. It was not fully completed till the year 1240, under the reign of Henry III. In 1444, the wooden part of the steeple was consumed by lightning. A misfortune of the same nature happened to it in 1561. The lightning struck the steeple within a yard of the weather-cock. A small light, like a torch, appeared at that place, which increased with such rapidity, that in a quarter of an hour the weather-cock fell down. The wind rising high at the same time, the whole steeple was burnt down to the battlements in an hour's time. The falling of the burning timber-work soon set fire to that which supported the bells, which by the vehemence of the conflagration were melted, and at the same time the roofs of the cathedral taking fire, the whole fabric was ruined.

After this conflagration, there was a general contribution among the clergy, nobility, great officers of state, the city of London, and queen Elizabeth herself, who gave 1000 merks of gold towards its speedy repair, with a warrant for 1000 loads of timber to be

cut

London.



London. cut in any of her woods: and the zeal shewn on this occasion, by persons of all ranks, had so good an effect, that in five years time, the timber roofs (the two largest whereof were framed in Yorkshire and brought from thence by sea) were entirely finished and covered with lead. But some difference in opinion arising about the model of the steeple, that part of the work was left unattempted, and never afterwards rebuilt: for, upon raising the roofs, the walls, by the corroding quality of the coal-smoke, were found to be so much decayed, that a general repair of the whole building was judged absolutely necessary; and though this was delayed from time to time, yet by the indefatigable application of Henry Farley, a private gentleman, king James came to this resolution, to undertake the arduous task of repairing the cathedral. For this purpose it was agreed to issue a proclamation under the great seal, empowering several principal personages, or any six of them, to inquire into the true state of the decays, with the cause thereof, and to consider of the necessary repairs, and the means of raising money for carrying them into execution. But it being afterwards found, that the ruin of the bishop, and of the principal dignitaries of the cathedral, was chiefly aimed at by the commissioners, the whole matter came at last to nothing. In the time of Charles I. however, between the years 1631 and 1643, no less than 101,330l. 4s. 8d. was laid out in repairing this cathedral. In 1643, the money, goods, and materials, bought or given for the repair of this cathedral, were seized by order of the parliament, and the body of the church was afterwards converted into horse-quarters for soldiers; a part of the building towards the east being partitioned off by a brick-wall, in the year 1649, for a preaching place. In 1660, this was made the choir, and the other parts of the church were repaired, when the whole was destroyed by the great fire in 1666. So vehement was the heat at that time, that the stones of the walls were splintered, and came off in great flakes; so that, instead of being repaired, this magnificent cathedral now required to be rebuilt from the foundation. Immediate attention was paid to this by the king and parliament; a tax was laid upon coals for the purpose; and it was rebuilt in such a manner, as to be excelled for its architecture by no structure in the world.

The old church was 690 feet long, and 130 broad; the height of the roof of the west part from the floor being 102 feet, that of the east only 88, and that of the body 150 feet. The height of the tower was 260 feet; from whence rose a wooden spire, covered with lead, 274 feet in height. On the top of this was a ball capable of holding ten bushels of corn; and upon that ball was a cross 15 feet high, whose traverse measured six feet. This fabric covered three acres and a half, one rood and a half, and six perches, of ground. Its ornaments exceeded those of every church in the kingdom. The chapels, chantries, monuments, inscriptions, anniversaries, and all other structures in and about the old church, are largely treated of in Dugdale's history of this cathedral.

It being resolved to erect a new cathedral, which should equal, if not exceed the magnificence of the old fabric, letters patent were issued under the great seal, authorising commissioners to give directions, and to

manage that work; and appointing Sir Christopher Wren, surveyor-general of all his majesty's works, to prepare a suitable design for the fabric; and king Charles II. was graciously pleased to give 1000l. per annum out of his privy purse, for carrying it on. Sir Christopher endeavoured to gratify the connoisseurs with a design antique and well-studied, conformable to the best style of the Greek and Roman architecture. Of this design he caused a curious large model to be made of wood, accurately wrought, with all its proper ornaments, and presented it to his majesty: but, the bishops not approving it, as not being enough of a cathedral fashion, the surveyor was ordered to amend it; and at length produced the scheme of the present structure, which was honoured with his majesty's approbation. The surveyor, however, set a higher value on the first design than on any other he ever drew. It was only of one order, viz. the *Corinthian*, like St Peter's at Rome; and the author of his life assures us, that he would have put it in execution with more cheerfulness than that which was afterwards erected.—This original model is still preserved in the cathedral, and may be seen at a small expence.

The work was begun in 1675, and finished in 1710, at the expence of 736,752l. 2s. 3d. according to Mr Entick; of 800,000l. according to others; and of more than a million, according to Smoliet. It hath three grand porticoes, supported by stately columns, on the north, south, and west sides; the nave and choir are paved with marble, and the altar with porphyry finely polished. The dome is painted by Sir James Thornhill, with the history of St Paul's conversion; and has on its vertex a neat balcony; and above that a beautiful stone lantern near 70 feet high, with a ball and fine gilt cross at top. The church is built of Portland stone, in form of a cross, in imitation of St Peter's at Rome.

The length of the cathedral from east to west is 500 feet within the walls; the breadth, from north to south within the doors of the porticoes, 223 feet; at the entrance, 100 feet; its circuit, 2292 feet; its height within, 110 feet; to the gallery of the dome, 208 feet; to the upper gallery 276; the diameter of the dome 108 feet; from thence to the top of the cross, 64 feet; of the cross from the ball, 30 feet; the diameter of the ball, six feet; the diameter of the columns of the porticoes four feet; their height 48 feet; to the top of the west pediment under the figure of St Paul, 120 feet; of the towers at the west front 280 feet; and the extent of the ground-plot whereon it stands, two acres, 16 perches, 23 yards, one foot. This vault fabric is surrounded at a proper distance with strong iron palisades, in number about 2500; and in the area of the grand west front, on a pedestal of excellent workmanship, stands a statue of queen Anne, with proper decorations. The figures on the base represent Britannia with her spear, Gallia with a crown in her lap, Hibernia with her harp, and America with her bow; all the workmanship of the same ingenious artist. The following are the dimensions of the old cathedral compared with the new and with the church of St Peter's at Rome.

|  | Old<br>St Paul's.<br>Feet. | New<br>St Paul's.<br>Feet. | St<br>Peter's.<br>Feet. |
|--|----------------------------|----------------------------|-------------------------|
| Length within                          | 690                        | 500                        | 669                     |
| Breadth at the entrance                |                            | 100                        | 226                     |
| Front without                          |                            | 180                        | 395                     |
| Broad at the crofs                     | 130                        | 223                        | 442                     |
| Cupola clear                           |                            | 108                        | 139                     |
| Height from the level of the<br>ground | 520                        | 440                        | 578                     |
| Height of the churches                 | 150                        | 110                        | 146                     |
| Height of cupola and lan-<br>thorn     |                            | 330                        | 432                     |

The cathedral of St Paul's is governed by a bishop, a dean, a precentor, chancellor, treasurer, five archdeacons, 30 prebendaries, 12 petty canons or minor canons, six vicars coral, and several other inferior officers. All the prebends or canopies are in the collation of the bishop of the diocese; and out of these 30 canons there are three residentiaries, besides the dean; so called from their continual residence in the church, to transact the business of the church in the chapter, and take care of her daily concerns.

4. *Westminster abbey* was founded in 610, but soon after ruined by the Danes. It was rebuilt in 1053 by the recommendation of a religious hermit, who pretended to bring a commission for that purpose from God himself. It was endowed with great privileges by king Edward the Confessor; who had them confirmed by a bull from pope Nicholas. The king also thought proper to insert that bull of confirmation in the charter granted by himself; in which bull and charter there is a remarkable clause, setting forth, "That the place where the said church and monastery were built, was anciently the seat of kings: therefore, says the pope, by the authority of God and his holy apostles and this Roman see, and our own, we grant, permit, and most solidly confirm, that hereafter for ever, it be the place of the king's consecration or coronation, and consecration; the repository of the royal crown and ensigns of majesty; and a perpetual habitation of monks, who shall be subject to no other person at all, but only to the king himself."

Westminster abbey is at present a collegiate church; and the dean and 12 prebendaries were incorporated by the name of the *dean and chapter of the collegiate church of St Peter, Westminster*, by queen Elizabeth, who also placed therein a school. The church is a magnificent pile of Gothic building, and has been adorned on the outside with the statues and figures of all the princes that have contributed towards the finishing of it. But this abbey suffered so much at the dissolution of the monastery, and during the civil commotions in the time of Charles I. that it gradually decayed almost to the present time, when the parliament ordered a thorough reparation at the national expence. In consequence of this interposition, the whole fabric has been new coated, except that part called *king Henry VII.'s chapel*, and the west end has been made more magnificent by the addition of two towers rebuilt in as masterly a manner as any other part of the abbey, but the beautiful carving and the statues with which it was once adorned are now lost.

The extent of this building is 360 feet within the walls, 72 feet broad at the nave, and 195 at the crofs.

The Gothic arches and side ailes are supported by 48 pillars of grey marble, each composed of clutters of very slender ones, and covered with ornaments. The grand entrance into the choir is by a pair of fine iron gates, on each side of which is a very magnificent tomb. The floor is paved with the handfomest blue and white marble. The stalls are covered with Gothic acute arches, supported by small iron pillars, and painted purple. At the east end is the altar, made of a beautiful piece of marble, the gift of queen Anne, inclosed by a curious balustrade, and upon a pavement of porphyry, jasper, Lydian, and serpentine stones, laid in the Mosaic stile, at the expence of abbot Ware, A. D. 1272; and is said to be one of the most beautiful of its kind in the world.

On each side of this altar a door opens into St Edward's chapel; round which are ten other chapels, ranging from the north to the south crofs ailes, and are dedicated, 1. To St Andrew. 2. To St Michael. 3. To St John Evangelist. 4. Isip's chapel. 5. To St John Baptist. 6. To St Paul. 7. Henry V.'s chapel. 8. To St Nicholas. 9. To St Edmund. 10. To St Benedict.

In St Edward's chapel are still to be seen the remains of his shrine; which, though now in obscurity, and robbed of all its riches and lustre, was once esteemed the glory of England, so far as art and riches could make it. Here are the tombs of king Edward I. and several other kings and queens of England; and here also is shown the famous chair in which the kings of Scotland used to be crowned at Secon. Henry V.'s chapel is divided from St Edward's by an iron screen, on each side of which are statues as big as life.—St Andrew's chapel, which is next the north crofs, and the others which surround the choir, are crowded with the monuments of noble personages, worth the attention of the curious.—At the corner of St Benedict's chapel, an iron gate opens into the south crofs aile; which from the number of monuments erected therein to celebrated English poets, has obtained the name of the *poets corner*: though here we find a most magnificent monument erected at the south end in memory of the late John duke of Argyle and Greenwich; another to William Camden the antiquarian; and others to the celebrated divine Dr Isaac Barrow, to Thomas Parr who died at the age of 152 years, &c.

The fourth aile is adorned with 19 curious monuments of the pious, the brave, and the learned. Amongst whom, next the entrance at the west end, is a noble monument, erected by order of parliament, in honour of the brave captain Cornwall. And turning northward from the west door, we view 48 more monuments worthy of notice.

On the east of the abbey, and which, though separate from the other chapels in the choir, seems to be one and the same building with the abbey, stands the chapel of king Henry VII. which that king founded in the year 1502, and was at that time styled *the wonder of the world*, and is now one of the most expensive remains of the ancient English taste and magnificence. There is no looking upon it without admiration: it conveys an idea of the fine taste of Gothic architecture in that age; and the inside is so noble, majestic, and of such curious workmanship, that it would take a volume to describe each part with justice and propriety.

Its original intention was to be a dormitory for the royal blood: and so far the will of the founder has been observed, that none have been interred therein, but such as have traced their descent from ancient kings. The tomb of king Henry VII. is most magnificent, inclosed with a screen of cast brass, most admirably designed, and as well executed. Within the rails are the figures of that king and his royal consort, in their robes of state, on a tomb of black marble: and at the head of this tomb lie the remains of Edward VI. In different parts of this chapel are the monuments of Lewis Stuart duke of Richmond, George Villars duke of Buckingham, John Sheffield duke of Buckingham, Charles Montague marquis of Halifax, Edward V. and his brother Richard; the vault of James I. and his queen Anne, and daughter Mary, on which is a small tomb adorned with the figure of a child; a lofty monument of queen Elizabeth, and another of Mary queen of Scots; the monuments for Margaret Douglas, daughter of Margaret queen of Scots, Margaret countess of Richmond mother to Henry VII. the vault of king Charles II. and William III. queen Mary his consort, queen Anne and prince George. Over these royal personages are their effigies (except that of prince George) in waincoat pannels, made of wax to resemble life, and dressed in their coronation robes. And at the corner of the great east window, in another waincoat panel, stands the effigy of Mary duchess of Richmond, daughter to James duke of Richmond and Lennox, dressed in the very robes she wore at the coronation of queen Anne. On leaving the aisle, you are shewn another panel, containing the effigy of general Monk, who, on account of his loyalty, and part he took in the restoration of king Charles II. had a vault appropriated to him and his family, amongst the royal blood. It only remains to observe, that the royal family of the house of Hanover are interred in a vault under the centre of this chapel; without any monumental inscription or ornaments.

5. *Westminster-hall*, built by William Rufus, as an addition to the palace of Westminster, was rebuilt, A.D. 1397, by king Richard II. with additional apartments on the east and west sides, and called the *new palace*, to distinguish it from the old palace, where the house of lords and commons now assemble. The front of this hall is narrow, built with stone in the Gothic taste, with a tower on each side the entrance, adorned with much carved work. The part called the *hall*, is supposed to be the largest room in Europe not supported by pillars, being 270 feet long, and 74 broad. It is a regular Gothic structure. In this hall we find the high courts of equity and justice; the high court of chancery at the north-west corner, and the court of king's bench at the south-west corner: about the middle on the north-side is the court of common-pleas; and at the north-east corner is his majesty's court of exchequer.

In the south-west angle of new palace-yard stands the exchequer, or the office of the receipt of his majesty's exchequer: a plain old building of wood and plaster, where the king's revenue is received and disbursed: and to which belong the several offices called the *pipe-office* in Gray's inn, *foreign exchequer's office* and *king's remembrancer's office* in the Temple; *clerk of the pleas office*, in Lincoln's-inn, &c.

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Behind, to the westward of Westminster-hall and the exchequer, we come to the seat of judicature, the house of commons and the house of lords.

The house of commons, composed of the representatives of the people, and elected by them for counties, cities, and boroughs, sit upon national affairs in St Stephen's chapel, at the south-west angle of Westminster-hall, built originally by king Stephen; and has been appropriated to its present use ever since the reign of king Edward VI. and now called the *house of commons*; to which there is a communication and an ascent from Westminster-hall, by a dark entry and a grand flight of stone stairs.

From hence passing through a kind of hall paved with stone, called the *court of requests*, used chiefly by those who attend the parliament to walk in, we come, on the left hand, into the house of Lords, a spacious lofty room, well disposed for the convenience of the peers of the realm, who sit there upon national affairs, and concur with the commons in making laws to be signed by the sovereign upon the throne, and hung with tapestry representing the defeat of the Spanish armada.

6. *Guild hall* stands at the north end of King street. In it the nine courts of the city are kept, viz. 1. The court of common-council. 2. The court of the lord-mayor, and his brethren the aldermen. 3. The court of husting. 4. The court of orphans. 5. The two courts of the sheriffs. 6. The court of the wardmote. 7. The court of hallmote. 8. The court of requests, commonly called the *court of conscience*. 9. The chamberlain's court for binding apprentices, and making them free.

The guildhall stood formerly in or near Aldermanbury, or Aldermens-court, from which situation of this hall the street is said to take its denomination, and consequently the hall must have been founded before the year 1189; for then we find this street to have had that name. And it is not unlikely that Edward the Confessor, who began to reign in 1042, had a considerable share in the first foundation, his arms being in several places of this present hall: "Which (Robert Fabian saith) was begun to be new-built in the year 1411, the 12th of Henry IV. by Thomas Knowles, then mayor, and by his brethren the aldermen. The same was made, of a little cottage, a large and great house, as it now stands. Towards the charge whereof the companies gave great benevolences. Also offences of men were pardoned for sums of money towards this work; and extraordinary fees were raised, fines, amerciaments, and other things employed, during seven years, and a continuation thereof three years more; all to be employed to this building."

This stately hall being much damaged by the unhappy conflagration of the city in the year 1666, was restored anno 1679, and extremely well beautified and repaired both in and out-side, which cost about 2500l. The portico is adorned with a stately Gothic frontispiece, enriched with the king's arms under a cornice, pediment, and vase, and between two cartouches and the city-supporters, on acroters, and these between two other vases, under which are niches; and in the middle of this front are dependant in gold these words:

*Reparata & ornata Thoma Ralifon, milit. Majore,*  
*An. Dom. MDCCVI.*

24 I

Above



London. Above the balcony are the figures of Moses and Aaron; on the sides beneath, are the four cardinal virtues, over the aperture; and below the balcony are depicted the arms of the 24 companies.

The roof of the inside is flat, divided into pannels; the walls on the north and south sides are adorned with four Gothic demi-pillars, painted white, and veined with blue, and the capitals gilt with gold, upon which are the royal arms, and those of Edward the Confessor. Going up nine or ten steps to the mayor's court, on each side, at some height, are two giants of an enormous size, the one holding a pole ax, the other an halbert; supposed by Mr Strype to be an ancient Briton and a Saxon.

Between these, and over the steps and aperture leading to the mayor's court, is a balcony, supported at each end by four iron pillars in the form of palm trees, which compose something like two arbours; under these are the following large capital letters, S. P. Q. L. i. e. *Senatus Populusque Londinensis*.

Round the hall, on 14 demi pillars above the capitals, are the king's arms on the north-eastward, and the arms of London on the south-eastward pillar; and westward from thence are the arms of the 12 companies; at the east end are the king's arms between the portraits, finely painted, of their late majesties king George II. and queen Caroline: close by the first is the picture of queen Anne, at the foot of an anabathrum, under a rich canopy; by the latter, his late majesty king George I. and at the same end of the hall, but on the north and south sides, the pictures of king William III. and queen Mary, fronting each other. The intercolumns are painted in imitation of porphyry, and embellished with the pictures, in full proportion, of 18 judges, which were there put up by the city in gratitude for their signal services done in determining differences between landlord and tenant (without the expense of law-suits), in rebuilding the city, pursuant to an act of parliament, after the fire in 1666.

This hall is in length 153 feet, breadth 48, and altitude within 55. It is used by the city for the session of the several courts of judicature before named; for feasting our kings, queens, and other potentates, foreign ministers, &c.; and lastly, for choosing the lord-mayor, sheriffs, members of parliament, &c. it being capacious enough to contain 7000 persons.

7. The college of physicians stands on the west side of Warwick-lane in Farringdon-ward without. It is a most noble edifice of brick and stone. The entrance is grand, under an octagonal theatre, finishing in a dome, with a cone at the top making a lantern to it. The inside is elegant, finely enlightened, and very capacious; designed by Sir Christopher Wren. The central building, which contains the library and other rooms of state and convenience, was the design of Inigo Jones. The ascent to the door is by a flight of steps, and in the under part is a calemment story. On one side, over the door-case, is the statue of king Charles II. in a niche; on the other side, the statue of Sir John Cutler. The whole front is decorated with pilasters of the Ionic and Corinthian orders. The buildings at the two sides of the court are uniform, with window-cases handsomely ornamented. Within is a great hall for the quarterly meetings of the doctors, adorned with pictures and sculpture; a theatre for anatomical dissection; a

preparing room, where there are 13 tables, containing all the muscles, &c. of the human body; a library well furnished with books; a committee-room; a hall in which the physicians sit to give advice gratis to the poor; besides the different apartments for the servants, officers, &c.

The physicians were incorporated in the 10th of Henry VIII. An account of their constitution and privileges is given under the article COLLEGE.

8. The *British Museum*, a magnificent building situated in Russell-Street, and containing an amazing number of curiosities, is described under the article MUSEUM.

9. *Ranelagh Gardens* are one of those public places of pleasure about this metropolis, which are not to be equalled in any part of Europe. The gardens themselves are very beautiful; but the amphitheatre is much more to be admired. It is a circular building, whose external diameter is 185 feet. Round the whole is an arcade; over that, a gallery and ballustrade, (to admit the company into the upper-boxes,) except where the entrances break the continuity; and over this are the windows and roof. The internal diameter is 150 feet; and the architecture of the inside corresponds with the outside, except that over every column, between the windows, termini support the roof. In the middle of the area is a chimney with four faces, which makes it warm and comfortable in cold weather. The orchestra fills up the place which was originally one of the entrances. The orchestra then stood on the centre, where the chimney is at present. The entertainment consists of a fine band of music, with an organ, and some of the best voices: and the regale is tea and coffee, included in the money paid for entrance.

10. *Vauxhall Gardens*, which take their name from the village of Vauxhall, about two miles from London bridge, in the parish of Lambeth and county of Surrey, are also celebrated all over Europe for the entertainment they afford. A noble gravel-walk, of about 900 feet in length, planted on each side with very lofty trees, which form a fine villa, leads from the great gate, and is terminated by a landscape of the country, a beautiful lawn of meadow-ground, and a grand Gothic obelisk. At the corners of the obelisk are painted a number of slaves chained, and over them this inscription:

SPECTATOR  
FASTIDIOSUS  
SIBI MOLESTUS.

To the right of this walk, and a few steps within the garden, is a square, which, from the number of trees planted in it, is called the *grove*; in the middle of it is a magnificent orchestra of Gothic construction, ornamented with carvings and niches, the dome of which is surmounted with a plume of feathers, the crest of the prince of Wales. In fine weather, the musical entertainments are performed here. At the upper extremity of this orchestra a very fine organ is erected; and at the foot of it are the seats and desks for the musicians, placed in a semicircular form, leaving a vacancy at the front for the vocal performers. The concert is opened with instrumental music at six o'clock; which having continued about half an hour, the company are entertained with a song; and in this manner several other songs are performed, with sonatas and

and concertos between each, till the close of the entertainment, which is generally about 10 o'clock. A curious piece of machinery is exhibited about 9 o'clock, in a hollow on the left hand, about half-way up the walk already described, representing a beautiful landscape in perspective, with a miller's house, a water-mill, and a cascade. The grove is illuminated in the evening with about 1500 glass lamps; in the front of the orchestra they are contrived to form three triumphal arches, and are all lighted, as it were, in a moment. In cold or rainy weather, the musical performance is in a rotunda 70 feet in diameter, on the left side of the entrance into the gardens, nearly opposite to the orchestra. Along the front, next the grove, is a piazza formed by a range of pillars, under which is the entrance from the grove. The front of the ceiling is supported by four columns of the Ionic order, embellished with foliage from the base a considerable way upwards; and the remaining part of the shaft, to the capital, is finely wreathed with a Gothic ballustrade, where boys are represented ascending it. In the centre hangs a magnificent chandelier, 11 feet in diameter, containing 72 lamps in three rows. The top is a dome, slated on the outside, and painted within like a shell. The roof is so contrived, that sounds never vibrate under it. A part of the rotunda is laid open for receiving a saloon; and its entrance here is formed and decorated with columns like those in the front of the orchestra. In the roof, which is arched and elliptic, are two little cupolas in a peculiar taste, and adorned with painting; and in the summit of each is a sky-light, divided into 10 compartments, with frames in the Gothic style. Above each cupola is an arch divided into compartments; from the centre of each of which, depends a large chandelier, in the form of a basket of flowers. Adjoining to the walls are 10 three-quarter columns. Between these columns are four paintings by Hayman, on subjects of British glory.

The entrance into this saloon from the gardens is through a Gothic portal. The pavilions or alcoves are ornamented with paintings from the designs of Mr Hayman and Mr Hugarth, on subjects adapted to the place; and each pavilion has a table in it large enough for six or eight persons. The pavilions continue in a sweep, which leads to a beautiful piazza, and a colonnade 500 feet in length, in the form of a semicircle, of Gothic architecture, embellished with rays. This semicircle leads to a sweep of pavilions that terminate in the great walk. Near the centre of the gardens is a cross gravel-walk formed by stately trees on each side. On the right hand, it is terminated by the trees which shade the lover's walk; and at the extremity on the left, is a beautiful landscape painting of ruins and running water. At each end of another walk is a beautiful painting: one is a building, with a scaffold and a ladder before it, which has often deceived the eye; the other is a view in a Chinese garden. The principal part of all those walks forms the boundaries of wildernesses composed of trees which shoot to a great height, and are all inclosed with an espalier in the Chinese taste.

11. *The Monument* is a great fluted pillar, of the Doric order, erected in memory of the conflagration in 1666. It is situated on the east side of Fish-street

hill, facing Crooked-lane. It was begun by Sir Christopher Wren in 1671, and finished by him in 1677. Its height from the pavement is 202 feet; the diameter of the shaft, or body of the column, is 15 feet; the ground-plinth, or lowest part of the pedestal, is 28 feet square; and the pedestal is 40 feet high. Over the capital is an iron balcony encompassing a cone 32 feet high, which supports a blazing urn of gilt brass. Within is a large stair-case of black marble, containing 345 steps, each 10 inches and a half broad, and six inches thick. The well side is adorned with a curious emblem in alto-relief, denoting the destruction and restoration of the city. The first female figure represents London sitting in ruins, in a languishing posture, with her head dejected, her hair dishevelled, and her hand carelessly lying on her sword. Behind is *Time*, gradually raising her up: at her side is a woman touching her with one hand, whilst a winged sceptre in the other directs her to regard the goddesses in the clouds; one with a cornucopia, denoting *Plenty*; the other with a palm branch, the emblem of *Peace*. At her feet is a bee-hive, shewing, that by industry and application the greatest misfortunes are to be overcome. Behind the figure of *Time* are citizens exulting at his endeavours to restore her; and beneath, in the midst of the ruins, is a dragon, who, as the supporter of the city-arms, with his paw endeavours to preserve the same. Opposite to the city, on an elevated pavement, stands the king, in a Roman habit, with a laurel on his head, and a truncheon in his hand; and approaching her, commands three of his attendants to defend to her relief. The first represents the *Sciences*, with a winged head, and circle of naked boys dancing thereon; and holding *Nature* in her hand, with her numerous breasts, ready to give assistance to all. The second is *Architecture*, with a plan in one hand, and a square and pair of compasses in the other; and the third is *Liberty*, waving a hat in the air, shewing her joy at the pleasing prospect of the city's speedy recovery. Behind the king stands his brother the duke of York, with a garland in one hand to crown the rising city, and a sword in the other for her defence. The two figures behind are *Justice* and *Fortitude*; the former with a coronet, and the latter with a reined lion; and under the royal pavement lies *Envy*, gnawing a heart, and incessantly emitting pestiferous fumes from her mouth. On the plinth the reconstruction of the city is represented by builders and labourers at work upon houses. On the north, south, and east sides, are inscriptions relating the destruction occasioned by the conflagration, the regulations about rebuilding the city, and erecting the monument; and round it is the following one:—"This pillar was set up in perpetual remembrance of the most dreadful burning of this Protestant city, begun and carried on by the treachery and malice of the Popish faction, in the beginning of September, in the year of our Lord 1666, in order to their carrying on their horrid plot for extirpating the Protestant religion and old English liberty, and introducing Popery and slavery."

The city and liberties of London are under a civil, ecclesiastical, and military government. 30  
Government of the city.

The *civil* divides itself into wards and precincts, under a lord-mayor, aldermen, and common-council;

London. the ecclesiastical into parishes, under a bishop, archdeacon, and ministers or pastors; and the *military* is the militia, under the power of a lord-lieutenant, which is lodged in the mayor and aldermen, and some of the principal citizens, the city being erected by charter a county-corporate, and a lieutenancy by itself. London.

The civil government of this city, in its present form, may be said, in every respect, to resemble the legislative power of the nation; the mayor, aldermen, and common-council men, making laws and governing the city of London, as the king, lords, and commons, preside over, govern, and make laws for the whole nation.

31  
I.ord-  
mayor.

The mayor, or lord-mayor, is the supreme magistrate of London, chosen annually by the citizens, pursuant to a charter of king John. The present manner of electing a lord-mayor is by the liverymen of the several companies, assembled in Guildhall annually on Michaelmas-day, according to an act of common-council, A. D. 1476, where, and when, the livery-men choose, or rather nominate, two aldermen below the chair, who have served the office of sheriff, to be returned to the court of aldermen, who may choose either of the two; but generally declare the senior of the two, so returned, to be lord-mayor elect. The election being over, the lord-mayor elect, accompanied by the recorder and divers aldermen, is soon after presented to the lord-chancellor (as his majesty's representative in the city of London) for his approbation; and on the 9th of November following is sworn into the office of mayor, at Guildhall; and, on the day after, before the barons of the exchequer at Westminster; the procession on which occasion is exceedingly grand and magnificent.

The lord-mayor sits every morning at the mansion-house, or place where he keeps his mayoralty, to determine any difference that may happen among the citizens, and to do other business incident to the office of a chief magistrate. Once in six weeks, or eight times in the year, he sits as chief judge of Oyer and Terminer, or gaol-delivery of Newgate for London and the county of Middlesex. His jurisdiction extends all over the city and suburbs, except some places that are exempt. It extends also from Colneyditch, above Staines bridge in the west, to Yeudale, or Yenleste, and the mouth of the river Medway, and up the river to Upnor castle, in the east: by which he exercises the power of punishing or correcting all persons that shall annoy the streams, banks, or fish. For which purpose his lordship holds several *courts of conservancy* in the countries adjacent to the said river, for its conservation, and for the punishment of offenders.

32  
Aldermen.

The title of dignity, *alderman*, is of Saxon original, and of the greatest honour, answering to that of earl; though now it is nowhere to be found but in chartered societies. And from hence we may account for the reason why the aldermen and commonalty of London were called *barons* after the conquest. These magistrates are properly the subordinate governors of their respective wards under the lord-mayor's jurisdiction; and they originally held their aldermannies either by inheritance or purchase; at which time the aldermannies or wards changed their names as often as their governors or aldermen. The oppressions, to which the

citizens were subject from such a government, put them upon means to abolish the perpetuity of that office; and they brought it to an annual election. But that manner of election being attended with many inconveniences, and becoming a continual bone of contention amongst the citizens, the parliament, 17 Richard II. A.D. 1394, enacted, That the aldermen of London should continue in their several offices during life or good behaviour. And so it still continues: though the manner of electing has several times varied. At present it is regulated by an act of parliament, passed in the year 1724-5; and the person so elected is to be returned by the lord mayor (or other returning officer in his stead, duly qualified to hold a court of wardmote) to the court of lord mayor and aldermen, by whom the person so returned must be admitted and sworn into the office of aldermen before he can act. If the person chosen refuseth to serve the office of alderman, he is fineable 500*l*.

These high officers constitute a second part of the city legislature when assembled in a corporate capacity, and exercise an executive power in their respective wards. The aldermen who have passed the chair, or served the high office of lord mayor, are justices of the quorum; and all the other aldermen are not only justices of the peace, but by the statute of 43 Eliz. intitled, *An act for the relief of the poor*, "every alderman of the city of London, within his ward, shall and may do and execute, in every respect, so much as is appointed and allowed by the said act to be done or executed by one or two justices of peace of any county within this realm." They every one keep their *wardmote*, or *court*, for choosing ward-officers and settling the affairs of the ward, to redress grievances, and to prevent all defaults found within their respective wards.

The next branch of the legislative power in this Common-council. 33  
city is the *common-council*. The many inconveniences that attended popular assemblies, which were called *folk-mote*, determined the commonalty of London to choose representatives to act in their name and for their interest, with the lord-mayor and aldermen, in all affairs relating to the city. At first these representatives were chosen out of the several companies; but that not being found satisfactory, nor properly the representatives of the whole body of the inhabitants, it was agreed to choose a certain number of discreet men out of each ward: which number has from time to time increased according to the dimensions of each ward: and at present the 25 wards, into which London is divided, being subdivided into 236 precincts, each precinct sends a representative to the common-council, who are elected after the same manner as an alderman, only with this difference, that as the lord-mayor presides in the wardmote, and is judge of the poll at the election of an alderman, so the alderman of each ward is judge of the poll at the election of a common-council man.

Thus the lord-mayor, aldermen, and common-council, when assembled, may be deemed the city parliament, resembling the great council of the nation. For it consists of two houses; one for the lord-mayor and aldermen, or the upper-house; another for the commoners or representatives of the people, commonly called the *common-council men*. And they have power in their incorporate capacity to make and repeal by-laws;



London,

laws; and the citizens are bound to obey or submit to those laws. When they meet in their incorporate capacity, they wear deep-blue silk gowns: and their assemblies are called the *court of common-council*, and their ordinances *acts of common-council*. No act can be performed in the name of the city of London without their concurrence. But they cannot affirm without a summons from the lord-mayor: who, nevertheless, is obliged to call a common-council, whenever it shall be demanded, upon extraordinary occasions, by six reputable citizens and members of that court.

<sup>34</sup> This corporation is assisted by two sheriffs and a recorder. The sheriffs are chartered officers, to perform certain suits and services, in the king's name, within the city of London and county of Middlesex, chosen by the liverymen of the several companies on Midsummer-day. Their office, according to Camden, in general, is to collect the public revenues within their several jurisdictions; to gather into the exchequer all fines belonging to the crown; to serve the king's writs of process; to attend the judges, and execute their orders; to impanel juries; to compel headstrong and obdurate men by the *pisse comitatus* to submit to the decisions of the laws; and to take care that all condemned criminals be duly punished and executed. In particular, in London, they are to execute the orders of the common-council, when they have resolved to address his majesty, or to petition parliament.

The sheriffs, by virtue of their office, hold a court at Guildhall every Wednesday and Friday, for actions entered at Wood-street Compter; and on Thursdays, and Saturdays for those entered at the Poultry Compter: of which the sheriffs being judges, each has his assistant, or deputy, who are called the judges of those courts; before whom are tried actions of debt, trespass, covenant, &c. and where the testimony of any absent witness in writing is allowed to be good evidence. To each of these courts belong four attorneys, who, upon their being admitted by the court of aldermen, have an oath administered to them.

To each of these courts likewise belong a secondary, a clerk of the papers, a prothonotary, and four clerks-fitters. The secondary's office is to allow and return all writs brought to remove clerks out of the said courts; the clerk of the papers files and copies all declarations upon actions; the prothonotary draws and ingrosses all declarations; the clerks-fitters enter actions and attachments, and take bail and verdicts. To each of the compters, or prisons belonging to these courts, appertain 16 sergeants at mace, with a yeoman to each, besides inferior officers, and the prison-keeper.

In the sheriffs court may be tried actions of debt, case, trespass, account, covenant, and all personal actions, attachments, and sequestrations. When an erroneous judgment is given in either of the sheriffs courts of the city, the writ of error to reverse this judgment must be brought in the court of hustings before the lord mayor; for that is the superior court. The sheriffs of London may make arrests and serve executions on the river Thames.

We do not read of a recorder till the year 1304, who, by the nature of his office, seems to have been intended as an assistant, or assessor with, the lord mayor, in the execution of his high office, in matters of justice

and law. He is chosen by the lord-mayor and aldermen only; and takes place in all courts, and in the common-council, before any one that hath not been mayor. Of whom we have the following description in one of the books of the chamber. "He shall be, and is wont to be, one of the most skilful and virtuous apprentices of the law of the whole kingdom; whose office is always to sit on the right hand of the mayor, in recording pleas, and passing judgments; and by whom records and process, had before the lord-mayor and aldermen at Great St Martin's, ought to be recorded by word of mouth before the judges assigned there to correct errors. The mayor and aldermen have therefore used commonly to fet forth all other business, touching the city, before the king and his council, as also in certain of the king's courts, by Mr Recorder, as a chief man, endued with wisdom, and eminent for eloquence."

Mr recorder is looked upon to be the mouth of the city, to deliver all addresses to the king, &c. from the corporation; and he is the first officer in order of precedence that is paid a salary, which originally was no more than 10*l.* Sterling *per annum*, with some few perquisites; but it has from time to time been augmented to 280*l.* *per annum*, and become the road to preferment in the law. This office has sometimes been executed by a deputy.

The next chartered officer of this corporation is the chamberlain; an office of great repute and trust, and is in the choice of the livery annually. This officer, though chosen annually on Midsummer-day, is never displaced during his life, except some very great crime can be made out against him. He has the keeping of the moneys, lands, and goods, of the city-orphans, or takes good security for the payment thereof when the parties come to age. And to that end he is deemed in the law a sole corporation, to him and his successors, for orphans; and therefore a bond or a recognizance made to him and his successors, is recoverable by his successors. This officer hath a court peculiarly belonging to him. His office may be termed a public treasury, collecting the customs, moneys, and yearly revenues, and all other payments belonging to the corporation of the city. It has been generally customary for the government to appoint the chamberlain receiver of the land-tax.

The other officers under the lord-mayor are, 1. The <sup>35</sup> Other officers. common serjeant. He is to attend the lord-mayor and court of aldermen on court-days, and to be in council with them on all occasions, within or without the precincts or liberties of the city. He is to take care of orphans estates, either by taking account of them, or to sign their indentures, before their passing the lord-mayor and court of aldermen. And likewise he is to let, set, and manage the orphan's estates, according to his judgment, to the best advantage.

2. The town-clerk; who keeps the original charter of the city, the books, rolls, and other records, wherein are registered the acts and proceedings of the city; so that he may not be improperly termed the city-registrar: he is to attend the lord-mayor and aldermen at their courts, and signs all public instruments.

3. The city-remembrancer; who is to attend the lord-mayor on certain days, his business being to put

his

London.

4. The sword-bearer; who is to attend the lord-mayor at his going abroad, and to carry the sword before him, being the emblem of justice. This is an ancient and honourable office, representing the state and princely office of the king's most excellent majesty, in his representative of the lord-mayor; and, according to the rule of armory, "He must carry the sword upright, the hilts being holden under his bulk, and the blade directly up the midst of his breast, and so forth between the sword-bearer's brows."

5. The common-hunt; whose business is to take care of the pack of hounds belonging to the lord-mayor and citizens, and to attend them in hunting in those grounds to which they are authorized by charter.

6. The common-crier. It belongs to him and the serjeant at arms, to summon all executors and administrators of freemen to appear, and to bring in inventories of the personal estates of freemen, within two months after their decease: and he is to have notice of the appraisements. He is also to attend the lord-mayor on set days, and at the courts held weekly by the mayor and aldermen.

7. The water-bailiff; whose office is to look after the preservation of the river Thames, against all encroachments; and to look after the fishermen for the preservation of the young fry, to prevent the destroying them by unlawful nets. For that end there are juries for each county, that hath any part of it lying on the sides or shores of the said river; which juries, summoned by the water-bailiff at certain times, do make inquiry of all offences relating to the river and the fish, and make their presentments accordingly. He is also bound to attend the lord-mayor on set days in the week.

N. B. These seven purchase their places; except the town-clerk, who is chosen by the livery.

There are also three serjeant-carvers; three serjeants of the chamber; a serjeant of the channel; four yeomen of the water-side; an under water-bailiff; two yeomen of the chamber; two meal weighers; two yeomen of the wood wharfs; a foreign taker; city-marshals. There are besides these, seven gentlemen men; as, The sword bearer's man, the common hunt's two men, the common-crier's man, and the carver's three men.

Nine of the foregoing officers have liveries of the lord-mayor, viz. the sword-bearer and his man, the three carvers, and the four yeomen of the water-side. All the rest have liveries from the chamber of London.

The following officers are likewise belonging to the city; farmer of the markets, auditor, clerk of the chamber, clerk to the commissioners of the sewers, clerk of the court of conscience, beadle of the same court, clerk of the city-works, printer to the city, justice of the Bridge-yard, clerk-comptroller of the Bridge-house, steward of the Borough, bailiff of the Borough.

There are also a coroner, called so from *corona*, i. e. a *crown*, because he deals principally with the crown,

or in matters appertaining to the imperial crown of England. As to the antiquity of this office, there were coroners in the time of king Alfred, as appears by the book intitled *The mirror*. The lord-mayor for the time being, is coroner; but hath his deputy for the management thereof. In ancient time, this office was of such great esteem, that none could execute it under the degree of a knight. As the sheriff may inquire of all felonies, so the coroner is to inquire of all sudden deaths; and to that end he impannels a jury, takes evidence upon oath, and gives the charge to the jury.

Besides these officers, there are several courts in this city for the executing of justice, viz. the court of hustings, lord-mayor's court, &c. In the city there are also two subordinate kinds of government. One executed by the alderman, deputy, and common council men, and their inferior officers, in each ward; under which form are comprehended all the inhabitants, free or not free of the city. Every ward is therefore like a little free state, and at the same time subject to the lord-mayor as chief magistrate of the city. The housekeepers of each ward elect their representatives the common-council, who join in making bye-laws for the government of the city. The officers and servants of each ward manage the affairs belonging to it, without the assistance of the rest; and each has a court called the *wardmote*, as has been already described, for the management of its own affairs. The other, by the master, wardens, and court of assistants, of the incorporate companies; whose power reaches no further than over the members of their respective guilds or fraternities; except that in them is invested the power to choose representatives in parliament for the city, and all those magistrates and officers elected by a common-hall: which companies are invested with distinct powers, according to the tenor of their respective charters.

With regard to the number of inhabitants in London, they have commonly been reckoned at a million, or at least upwards of 700,000; but Mr Entick reduces this number to 500,000, and indeed considerably reduces the supposed number of inhabitants in several other great cities, altho' he estimates the number of houses in London at 100,000.

"If we compare London, (says he), with other cities both ancient and modern, we shall find that our metropolis is the most numerous. Nineveh, though its walls are said to encompass 480 furlongs, or 60 miles, does not appear to have contained above 403,000 citizens, which is 97,000 less than London. Babylon was also 60 English miles in compass, and not allowed to contain more than 487,921 inhabitants, which is 12,079 less than London. As to Jerusalem, the inhabitants did not amount to more than a sixth part of the present inhabitants of this metropolis. Rome has been the subject of many panegyrics; but, in its utmost extent, it never entertained more than 367,448, which is 132,552 less than in London. Constantinople is at this time allowed to have no more than 420,000 inhabitants; Grand Cairo no more than 300,000; Peking in China no more than 412,610: and to conclude this parallel, it may be concluded that Paris, whose enormity has been so extravagantly published, does not contain more than 437,438 inhabitants.

"Another method to arrive at some certainty about the

36  
Number of  
inhabitants.

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the number of inhabitants in such a vast place, is, that it has been calculated upon a presumption of the number of mouths, which consume yearly 369,635 quarters, and upwards, of wheat flour; 98,244 cattle; 711,123 sheep and lambs: 194,760 calves; 186,932 hogs; 52,000 sucking pigs; 115,536 bushels of oysters; 14,740,000 mackarel; 16,366,728 pounds of butter; 21,066,000 pounds of cheese; besides the infinite quantities of fowls of all sorts, of fish of all sorts, and of garden-stuff and milk: of which last article, reckoning only a gallon to each house in a week, there is expended annually 5,200,000 gallons. And in the year from Midsummer 1759 to 1760 there were brewed in the city and suburbs, 975,217 barrels and three firkins of beer.

LONDONDERRY, or COLERAINE, a county of Ireland, in the province of Ulster. It is bounded on the south and south-west by the county of Tyrone; by Antrim on the east, from which it is parted by the river Bann; by Donegal, on the west; and that county and the Deucaliedonian ocean, on the north. Its greatest length is about 36 miles, its breadth 30, containing about 251,510 acres. The bogs and heaths of this country are manured with sea-shells, as those of Donegal. Like that too, it is pretty champaign, and not unfruitful. It is particularly noted for a very clear river called the *Bann*, abounding with salmon, a fish said to delight in limpid streams. This river, to distinguish it from a lesser of the same name, is called the *Greater or Lower Bann*. In order to cultivate, settle, and civilize this county, king James I. granted it, by letters-patent, to a society, by the name of the *Governor and Assistants at London of the new plantation of Ulster in the realm of Ireland*. It contains six baronies; and, besides the two knights of the shire, sends to parliament two members for the city of Londonderry, and two each for Coleraine, and Newton-Limavady or Lamevady.

LONDONDERRY, or *Derry*, the capital of the county, and the see of a bishop, stands at the bottom of Lough-Foyle. This city has a very good port, to which ships of the greatest burden have access, and a considerable trade. It will be ever famous for the gallantry and perseverance with which it defended itself in three memorable sieges, in defiance of the greatest hardships and discouragements, namely, 1st, In 1641, when the rebels could not reduce it either by fraud or force. 2dly, In 1649, when it was besieged by the lord Ardes, and reduced almost to extremity by famine, till at last relieved by troops sent from England. 3dly, When it held out against the French and Irish from the 7th of December 1688, to the last day of July 1689, though it was neither well fortified, nor provided with a garrison or stores of provision and ammunition, and hardly any attempt made to relieve it during so long a time. Though the city is 20 miles up the river, yet very large ships can come up to the quay, where there is four or five fathoms of water. It is now well fortified with a strong wall, besides outworks; and along the banks of the river are several callies, and a fort. This city is of no great antiquity, having been built and planted in the reign of James I. by a colony sent by the society abovementioned. The trade of the town is very considerable, having not only a large

share in the herring-fishery, but sending ships also to the West-Indies, New-England, and Newfoundland, for which they are so advantageously situated, that a vessel bound from thence to America often arrives there before a London ship can get clear of the soundings, or arrive in the latitude of Londonderry. 'Tho' there are a great many shallows in Lough-Foyle, which serves it instead of a road; yet they are easily avoided, as there are deep channels between them. Those points called *Eniffone*, *Rufferhall*, or *Cully-head*, which lie a little to the west of the mouth of the harbour, are counted the most northerly of Ireland, lying in lat. 55. 20. The inhabitants of this city are almost all Protestants. It gives title of *earl* and *baron* to a branch of the family of Pitt. A late traveller says, "Derry is, perhaps, the cleanest, best built, and most beautifully situated town in Ireland; and, excepting Corke, as convenient as any for commerce, foreign and domestic; and, but for the restrictions on the trade of Ireland, would in a few years become a flourishing and wealthy city." The lake almost surrounds it; and the whole ground-plot both of it and its liberties belongs to the 12 great companies of London. Great quantities of salmon, salted and barrelled, are exported from hence to America.

LONG, an epithet given to whatever exceeds the usual standard of length.

LONG-BOAT, the largest and strongest boat belonging to any ship. It is principally employed to carry great burdens, as anchors, cables, ballast, &c. See BOAT.

LONGEVITY, length of life.

From the different longevities of men in the beginning of the world, after the flood, and in these ages, Mr Derham draws an argument, for the interposition of a divine Providence.

Immediately after the creation, when the world was to be peopled by one man and one woman, the ordinary age was 900 and upwards.—Immediately after the flood, when there were three persons to stock the world, their age was cut shorter, and none of those patriarchs, but Shem, arrived at 500.—In the second century we find none that reached 240: in the third, none but Terah that came to 200 years; the world, at least a part of it, by that time being so well peopled, that they had built cities, and were cantoned out into distant nations.—By degrees, as the number of people increased, their *longevity* dwindled, till it came down at length to 70 or 80 years: and there it stood, and has continued to stand ever since the time of Moses.—This is found a good medium, and by means hereof the world is neither overstocked, nor kept too thin; but life and death keep a pretty equal pace.

That the common duration of man's life has been the same in all ages since the world was peopled, is plain both from sacred and profane history. To pass by others, Plato lived to 81, and was accounted an old man: and the instances of *longevity* produced by Pliny, L. vii. c. 48. as very extraordinary, may most of them be matched in modern histories. Mr Carew (A) tells us, that there lived in his time, in Cornwall, one Polzew, who reached the age of 130; a kinsman of his lived to 112; one Mr



Longevity, Mr Beauchamp, to 106; and that there died in his own parish, in the short space of 14 weeks, four persons, whose years made together 340. The famous Thomas Par, who was born at Alderbury in Shropshire, lived to 152 years (B). In Oxfordshire, Dr Plott tells us of Richard Clifford, living, at Bolcot, to 114; Brian Stevens, at Woodstock, and two or three persons then living at Oxford, above 100 (C). Dr Willet informs us of a man who lived at Everden, in Bedfordshire, to the age of 124 (D). Dr Hakewill observes of William, marquis of Winchester, that he reached 107 (E). Dr Plott tells us, that Mr Biddulph, of Biddulph in Staffordshire, had 12 tenants living, whose ages, put together, made 1000 (F). Henry Jenkins, of Yorkhire, died at 168 (G). In Scotland also, some persons have attained to a very great ages. Buchanan mentions one, who at 140, was able to go out to fish, in a tempestuous sea, in his own little boat (H); and Mr Martin affirms, that one Tairville lived, in Shetland, to 180 (I). The counts of Desmond, in Ireland, who was known to Sir Walter Raleigh and Lord Bacon, lived to 140 (K).

No certain causes have hitherto been discovered to which the longevity of mankind can always be attributed. Some have attributed it to temperance and a country life; but instances of longevity are as rare among people who live in this way as among others who live more freely, provided they go not to great excesses. It would seem therefore, that at the first formation of the human body, the original stamina in some are of such a nature as to be capable of continuing life for a much longer time than in others, even where circumstances are otherwise very much alike. Hence we may easily see how it becomes exceedingly difficult, or rather impossible, to lay down a rule by following of which he may expect to attain to long life;—a deficiency in the original stamina cannot be supplied by art, though temperance and sobriety are undoubtedly the best methods of avoiding any waste of that strength which nature has originally given, or of shortening our life by bringing on diseases. See ABSTINENCE.

LONGFORD, a county of Ireland, 25 miles in length, and 16 in breadth, bounded on the east and south by West-Meath, on the north and north-west by Leirum and Cavan, and on the west by the river Shannon. It contains upwards of 5000 houses, 24 parishes, 6 baronies, 4 boroughs, and sends 10 members to parliament. It is a small, but rich and pleasant country, and the principal town is of the same name.

LONG-ISLAND, is an island of North America, in the colony of New-York, which is separated from the continent by a narrow channel; and is about 100 miles in length, and 12 in breadth, containing Queen's-county, Suffolk-county, and Richmond-county. There is a fine plain in the middle of the island, called *Salisbury-plain*, on which they have

horse-races; and gentlemen come to it from the neighbourhood of New-Market. The produce of this island is chiefly provisions for the mouth, such as wheat, Indian-corn, salt, beef, pork, fish, and strong-beer, which they send to the Caribbee Islands; and, in lieu of them, receive sugar, rum, cotton, and indigo.

LONGIMETRY, the art of measuring lengths, both accessible and inaccessible. See GEOMETRY and TRIGONOMETRY.

LONGING, is a preternatural appetite in pregnant women, and in some sick persons when about to recover. It is called *pica*, from the bird of that name, which is said to be subject to the same disorder. The disorder consists of both a desire of unusual things to eat and drink, and in being soon tired of one and wanting another. It is called *malacia*, from *μαλακία*, “weakness.” In pregnant women it is somewhat relieved by bleeding, and in about the fourth month of their pregnancy it leaves them. Chlorotic girls, and men who labour under suppressed hemorrhoids, are very subject to this complaint, and are relieved by promoting the respective evacuations. In general, whether this disorder is observed in pregnant women, in persons recovering from an acute fever, or in those who labour under obstructions of the natural evacuations, this craving of the appetite should be indulged.

LONGINICO, a town of Turkey in Europe, in the Morea, anciently called *Olympia*, famous for being the place where the Olympic games were celebrated, and for the temple of Jupiter Olympus, about a mile distant. It is now but a small place, seated on the river Alpheus, 10 miles from its mouth, and 50 fouth of Lepanto. E. Long. 22. o. N. Lat. 37. 30.

LONGINUS (Dionysius), a celebrated Greek critic of the third century, was probably an Athenian. His father's name is unknown, but by his mother he was allied to the celebrated Plutarch. His youth was spent in travelling with his parents, which gave him an opportunity to increase his knowledge, and improve his mind. After his travels he fixed his residence at Athens, and with the greatest assiduity applied to study. Here he published his Treatise on the Sublime; which raised his reputation to such a height, and gave the Athenians such an opinion of his judgment and taste, that they made him sovereign judge of all authors, and every thing was received and rejected by the public according to his decisions. He seems to have staid at Athens a long time; here he taught the academic philosophy, and among others had the famous Porphyry for his pupil. But it was at length his fortune to be drawn from Athens, and to mix in more active scenes; to train up young princes to virtue and glory; to guide the busy passions of the great to noble objects; to struggle for, and at last to die, in the cause of liberty. Zenobia, queen of the East, prevailed on him to undertake the education of her sons; and he soon gained an uncommon share in her esteem: she spent the vacant hours of her life in his conversation, and modelled her senti-

(B) Philosophical Transactions, No xlv. p. 886.—(C) Natural History of Oxfordshire, chap. ii. p. 19.—(D) Dr Andrew Willet's Hexapla in Gen. chap. v. §. 5. p. 68.—(E) Hakewill's Apology, lib. iii. p. 183.—(F) Natural History of Staffordshire, chap viii. p. 529.—(G) Philosophical Transactions, No cxxii. p. 266.—(H) *Reum Scot. Hist. lib. i.* Roberti Sibbaldi Prodr. Hist. Nat. Scot. lib. i. cap. 20. p. 44.—(I) Description of the Western Islands of Scotland, p. 373.—(K) Sir Walter Raleigh's History of the World, b. i. chap. 5. §. 5. Lord Bacon's Works, edit. 1753. vol. i. p. 241. See also Dr Baynard's Appendix to Sir J. Floyer's Treatise on Cold Baths.

Longi-  
mus,  
Longo-  
montanus.

sentiments and conduct by his instructions. That prince was at war with Aurelian; and being defeated by him near Antioch, was compelled to shut herself up in Palmyra, her capital city. The emperor wrote her a letter, in which he ordered her to surrender; to which she returned an answer, drawn up by Longinus, which filled him with resentment. The emperor laid siege to the city; and the Palmyrians were at length obliged to open their gates, and receive the conqueror. The queen and Longinus endeavoured to fly into Persia; but were unhappily overtaken and made prisoners when they were on the point of crossing the Euphrates. The queen, intimidated, weakly laid the blame of vindicating the liberty of her country on its true author; and the brave Longinus, to the disgrace of the conqueror, was carried away to immediate execution. The writings of Longinus were numerous, some on philosophical, but the greater part on critical subjects. Dr Pearce has collected the titles of 25 treatises, none of which, excepting that on the Sublime, have escaped the depredations of time and barbarians. On this imperfect piece the great fame of Longinus is raised, who, as Pope expresses it—"is himself the great sublime he draws." The best edition of his works is that by Toulus, printed at Utrecht in 1694, *cum notis variorum*. It has been translated into English by Mr Smith.

LONGISSIMUS DORSI. See ANATOMY, *Table of the Muscles*.

LONGITUDE of a STAR, in astronomy, an arch of the ecliptic, intercepted between the beginning of Aries and the point of the ecliptic cut by the star's circle of longitude.

LONGITUDE of any place on the surface of the earth. See GEOGRAPHY, ASTRONOMY, and NAVIGATION. See also HARRISON.

*Method of finding the LONGITUDE at Sea.* See NAVIGATION.

LONGITUDINAL, in general, denotes something placed lengthwise; thus some of the fibres in the vessels of the human body are placed longitudinally, others transversely or acrofs.

LONGOMONTANUS (Christian), a learned astronomer, born in a village of Denmark, in 1562. He was the son of a ploughman; and was obliged to suffer during his studies all the hardships to which he could be exposed, dividing his time, like the philosopher Cleantes, between the cultivation of the earth and the lessons he received from the minister of the place. At last, when he was 15, he stole away from his family, and went to Wiburg, where there was a college, in which he spent 11 years; and though he was obliged to earn a livelihood, he applied himself to study with such ardour, that among other sciences he learned the mathematics in great perfection. He afterwards went to Copenhagen; where the professors of that university in a short time conceived so high an opinion of him, that they recommended him to the celebrated Tycho Brahe. Longomontanus lived eight years with that famous astronomer, and was of great service to him in his observations and calculations. At length, being extremely desirous of obtaining a professor's chair in Denmark, Tycho Brahe consented, though with some difficulty, to deprive himself of his service; gave him a discharge, filled with the highest testimonies of his esteem; and furnished him with money for the

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expense of his long journey. He obtained a professorship of mathematics in the university of Copenhagen, in 1605; and discharged the duty of it worthily till his death, which happened in 1647. He wrote many learned works; amused himself with endeavouring to square the circle, and pretended that he had made that discovery; but Dr John Pell, an English mathematician, attacked him warmly on that subject, and proved that he was mistaken.

LONGUEVILLE, a town of France, in Upper Normandy, and in the territory of Caux, seated on the small river Lee, 17 miles north of Rouen. It has the title of a duchy. E. Long. 1. 10. N. Lat. 49. 46.

LONGWY, a town of France, on the frontiers of the duchy of Luxemburg, with a castle, divided into the old and new towns. This last was built and fortified by Lewis XIV. It is seated on an eminence. E. Long. 5. 51. N. Lat. 40. 32.

LONGUS, a Greek poet, author of a book, intitled *Ποιηματα*, or Pastorals, and a romance containing the loves of Daphnis and Chloe. Huetius, bishop of Avranches, speaks very advantageously of this work; but he censures the obscene touches with which it is interperfed. None of the ancient authors mention him, so the time when he lived cannot be certainly fixed. There is an English translation of this author, which is ascribed to the late J. Craggs, Esq; secretary of state.

Loniceræ, HONEYSUCKLE; a genus of the monogynia order, belonging to the pentandria class of plants.

*Species.* 1. The albigena, or upright red-berried honeysuckle, rises with a shrubby, short, thick, upright stem, branching strong and erectly four or five feet high; largely, spear-shaped leaves, in pairs opposite; and from the sides of the branches many red flowers by two's on long footstalks, each succeeded by two red berries joined together at their base; it flowers in August, and the berries ripen in autumn. 2. The cærulea, or blue-berried upright honeysuckle, rises with a shrubby upright stem, branching moderately three or four feet high, with many white flowers proceeding from the sides of the branches; appearing in May, and succeeded by blue berries joined together at their base. 3. The nigra, or black-berried upright honeysuckle, rises with a shrubby stem branching three or four feet high, with white flowers succeeded by single and distinct black-berries. 4. The tartarica, or Tartarian honeysuckle, rises with a shrubby upright stem, branching erectly three or four feet high; heart-shaped, opposite leaves, and whitish erect flowers succeeded by red berries, sometimes distinct, and sometimes double. 5. The diervilla, or yellow-flowered Acadian honeysuckle, rises with shrubby upright stalks, branching erect to the height of three or four feet; the branches terminated by clusters of pale yellow flowers, appearing in May and June, and sometimes continuing till autumn; but rarely ripening seeds here. 6. The xylum, or fly honeysuckle, rises with a strong shrubby stem, branching erect to the height of seven or eight feet; with erect white flowers proceeding from the sides of the branches; each succeeded by large double red berries, joined together at their base. The flowers appear in June, and the berries ripen in September. 7. The lymphoricarpa, or shrubby St Peter's-wort, rises with a shrubby, rough stem, branching erect four or five feet high,

Lonsdale,  
Looking  
glasses.

Loom.

high, with small greenish flowers appearing round the stalk in August. 8. The periclymenum, or common climbing honeysuckle, hath two principal varieties, viz. The English wild honeysuckle, or woodbine of our woods and hedges, and the Dutch or German honeysuckle. The former rises with shrubby, weak, very long slender stalks, and branches trailing on the ground, or climbing round any support; all terminated by oval imbricated heads, furnishing smallish flowers of white or red colours, and appearing from June or July till autumn. The Dutch honeysuckle rises with a shrubby declinated stalk, and long trailing purplish branches, terminated by oval imbricated heads, furnishing large beautiful red flowers of a fragrant odour, appearing in June and July. 9. The caprifolium, or Italian honeysuckle, rises with shrubby declinated stalks, sending out long slender trailing branches, terminated by verticillate or whorled bunches of close-fitting flowers, very fragrant, and white, red, and yellow colours. 10. The sempervirens, or evergreen trumpet-flowered honeysuckle, rises with a shrubby declinated stalk, sending out long slender trailing branches, terminated by naked verticillate spikes, of long, unreflexed, deep scarlet flowers, very beautiful, but of little fragrance.

*Culture.* The most easy method of propagating these plants is by layers or cuttings, especially the latter; both of these readily emit roots, and form plants in one year fit for transplantation. Some sorts are also propagated by suckers and feed.

**LONSDALE**, or *Kirkby LONSDALE*, a town of Westmoreland, seated on the river Lon, in a pleasant and rich valley of the same name. It is a large well-built town, has a handsome church, and a fine stone-bridge over the river. It is well inhabited; and is the best town in the county, except Kendal. W. Long. 2. 27. N. Lat. 54. 10.

**LOO**, a town of the United Provinces, in Guelderland, eight miles west of Deventer, where the prince of Orange has a fine palace. E. Long. 6. o. N. Lat. 52. 18.

**LOOF**, the after part of a ship's bow; or that part of her side forward where the planks begin to be incurved into an arch as they approach the stem.

**LOOK-OUT**, in the sea-language, a watchful attention to some important object or event which is expected to arise from the present situation of a ship, &c. It is principally used in navigation when there is a probability of danger from the real or supposed proximity of land, rocks, enemies, and, in short, whatever peril he may encounter through inattention, which might otherwise have been avoided by a prudent and necessary vigilance.

There is always a look-out kept on a ship's fore-castle at sea, to watch for any dangerous objects lying near her track, and to which she makes a gradual approach as the advances: the mate of the watch accordingly calls often from the quarter-deck, "Look out afore there!" to the persons appointed for this service.

**LOOKING-GLASSES**, are nothing but plain mirrors of glass; which, being impervious to the light, reflect the images of things placed before them; for the theory whereof, see the articles **MIRROR** and **REFLECTION**.

For the casting, grinding, and polishing of looking-

glasses, see the article **GLASS**.

For foliating of looking-glasses. See the article **FOLIATING**.

**LOOM**, a frame composed of a variety of parts, used in all the branches of weaving; for a particular description of which, see the article **WEAVING**.

*Heir-LOOM*, in law, are such goods and personal chattels, as, contrary to the nature of chattels, shall go by special custom to the heir along with the inheritance, and not to the executor of the last proprietor. The termination, *loom*, is of Saxon original; in which language it signifies a limb or member; so that an heir-loom is nothing else but a limb or member of the inheritance. They are generally such things as cannot be taken away without damaging or dismembering the freehold: otherwise the general rule is, that no chattel-interest whatsoever shall go to the heir, notwithstanding it be expressly limited to a man and his heirs, but shall vest in the executor. But deer in a real authorized park, fishes in a pond, doves in a dove-house, &c. though in themselves personal chattels, yet they are so annexed to, and so necessary to the well-being of, the inheritance, that they shall accompany the land wherever it vests, by either descent or purchase. For this reason also the ancient jewels of the crown are held to be heir-looms; for they are necessary to maintain the state, and support the dignity, of the sovereign for the time being. Charters likewise, and deeds, court-rolls, and other evidences of the land, together with the chests in which they are contained, shall pass together with the land to the heir, in the nature of heir-looms, and shall not go to the executor. By special custom also, in some places, carriages, utensils, and other household implements, may be heir-looms; but such custom must be strictly proved. On the other hand, by almost general custom, whatever is strongly affixed to the freehold or inheritance, and cannot be severed from thence without violence or damage, *quod ad edibus non facile revellitur*, is become a member of the inheritance, and shall thereupon pass to the heir; as chimney-pieces, pumps, old fixed or dormant tables, benches, and the like. A very similar notion to which prevails in the duchy of Brabant; where they rank certain things moveable among those of the immovable kind, calling them by a very peculiar appellation, *prædia volantia*, or volatile estates: such as beds, tables, and other heavy implements of furniture, which (as an author of their own observes) *dignitatem istam nacta sunt, ut villis, sylvis, et edibus, aliisque prædiis, comparantur; quod solidiora mobilia ipsi edibus ex destinatione patrisfamilias coherere videantur, et pro parte ipsarum adium æstimantur*.

Other personal chattels there are, which also descend to the heir in the nature of heir-looms; as a monument or tomb-stone in a church, or the coat-armour of his ancestor there hung up, with the penons and other ensigns of honour suited to his degree. In this case, albeit the freehold of the church is in the parson, and these are annexed to that freehold, yet cannot the parson or any other take them away or deface them, but is liable to an action from the heir. Pews in the church are somewhat of the same nature, which may descend by custom immemo-

Blackstone's  
Comment.

rial



Looking  
up  
Lophius.

rial (without any ecclesiastical concurrence) from the ancestor to the heir. But though the heir has a property in the monuments and effigies of his ancestors, yet he has none in their bodies or ashes; nor can he bring any civil action against such as indecently at least, if not impiously, violate and disturb their remains, when dead and buried. The parson indeed, who has the freehold of the soil, may bring an action of trespass against such as dig and disturb it: and, if any one in taking up a dead body steals the shroud or other apparel, it will be felony; for the property thereof remains in the executor, or whoever was at the charge of the funeral.

Heir-looms, though they be mere chattels, yet cannot be devised away from the heir by will; but such a devise is void, even by a tenant in fee-simple. For, though the owner might during his life have sold or disposed of them, as he might of the timber of the estate, since, as the inheritance was his own, he might mangle or dismember it as he pleased; yet, they being at his death instantly vested in the heir, the devise (which is subsequent, and not to take effect till after his death) shall be postponed to the custom, whereby they have already descended.

LOOMING, in the sea-language, an indistinct appearance of any distant object, as the sea-coast, ships, mountains, &c. as, "the shoals large before the wind;" "the looming of the land is high above the water, &c."

LOPES LE VEGA, See VEGA.

LOPHIUS, FISHING-FROG, *Toad-fish*, or *Sea-devil*; a genus of the branchioplegious order of fishes, whose head is in size equal to all the rest of the body. There are three species, the most remarkable of which is the piscatorius, or common fishing-frog, an inhabitant of the British seas. This singular fish was known to the ancients by the name of *Βατραχίου*, and *Rana*; and to us by that of the *fishing-frog*, for it is of a figure resembling that animal in a tadpole state. Pliny takes notice of the artifice used by it to take its prey: *Eminentia sub oculis cornicula turbato limo erit, assultantes pisciculos attrahens, donec tam prope accedunt, ut assiliat.* "It puts forth the slender horns it has beneath its eyes, enticing by that means the little fish to play round, till they come within reach, when it springs on them." The fishing-frog grows to a large size, some being between four and five feet in length; and Mr Pennant mentions one taken near Scarborough, whose mouth was a yard wide. The fishermen on that coast have a great regard for this fish, from a supposition that it is a great enemy to the dog-fish; and whenever they take it with their lines, let it at liberty.

It is a fish of very great deformity: the head is much bigger than the whole body; is round at the circumference, and flat above; the mouth of a prodigious wideness. The under jaw is much longer than the upper: the jaws are full of slender sharp teeth: in the roof of the mouth are two or three rows of the same: at the root of the tongue, opposite each other, are two bones of an elliptical form, thick set, with very strong sharp teeth. The nostrils do not appear externally, but in the upper part of the mouth are two large orifices that serve instead of them. On each side the upper jaw are two sharp

spines, and others are scattered about the upper part of the head. Immediately above the nose are two long tough filaments, and on the back three others; these are what Pliny calls *cornicula*, and says it makes use of to attract the little fish. They seem to be like lines flung out for that end. Along the edges of the head and body are a multitude of short fringed skins, placed at equal distances. The aperture to the gills is placed behind; each of these is very wide, so that some writers have imagined it to be a receptacle for the young in time of danger. The body grows slender near the tail, the end of which is quite even. The colour of the upper part of this fish is dusky, the lower part white; the skin smooth.

LORANTHUS, in botany, a genus of the monogynia order, belonging to the hexandria class of plants. There is only one species, a native of America, discovered by Father Plumier, and found growing naturally at La Vera Cruz by Dr Houlton. It rises with a shrubby stalk, eight, or 10 feet high, dividing into several branches, having at their ends clusters of small scarlet-coloured flowers, succeeded by oval berries with a pulpy covering, and a hard shell with one cell, inclosing several compressed seeds. It is propagated by seeds, which should be sown soon after they are ripe; otherwise they are very apt to miscarry, or lie a year in the ground without germinating. The plants require always to be kept in a bark-stove.

LORD, a title of honour given to those who are noble either by birth or creation. In this sense, it amounts to much the same as *peer of the realm*, or *lord of parliament*. The title is by courtesy also given to all the sons of dukes and marquises, and to the eldest sons of earls: and it is also a title of honour bestowed on those who are honourable by their employments; as *lord advocate*, *lord chamberlain*, *lord chancellor*, &c. The word is Saxon, but abbreviated from two syllables into one; for it was originally *Illaford*, which, by dropping the aspiration, became *Laforde*, and afterwards, by contraction, *Lord*. "The etymology of the word (says J. Coates) is well worth observing: for it was composed of *illaf*, "a loaf of bread," and *ford*, "to give, or afford;" so that *Illaford*, now *Lord*, implies "a giver of bread;" because, in those ages, such great men kept extraordinary houses, and fed all the poor; for which reason they were called *givers of bread*, a thing now much out of date; great men being fond of retaining the title, but few regarding the practice for which it was first given. See LADY.

House of LORDS, one of the three estates of parliament, and composed of the Lords Spiritual and Temporal.

1. The *Spiritual Lords* consist of 2 archbishops, and 24 bishops; and, at the dissolution of monasteries by Henry VIII. consisted likewise of 26 mitred abbots, and two priors: a very considerable body, and in those times equal in number to the temporal nobility. All these hold, or are supposed to hold, certain ancient baronies under the king: for William the Conqueror thought proper to change the spiritual tenure of frank-almoign or free-alms, under which the bishops held their lands during the Saxon government, into the feudal or Norman tenure by barony; which subjected

Lords.

their estates to all civil charges and affluents, from which they were before exempt; and, in right of succession to those baronies, which were alienable from their respective dignities, the bishops and abbots were allowed their seats in the house of lords. But though these lords spiritual are in the eye of the law a distinct estate from the lords temporal, and are so distinguished in most of our acts of parliament; yet in practice they are usually blended together under the name of *the lords*; they intermix in their votes, and the majority of such intermixture joins both estates. And from this want of a separate assembly, and separate negative of the prelates, some writers have argued very cogently, that the lords spiritual and temporal are now in reality only one estate: which is unquestionably true in every effectual sense, though the ancient distinction between them still nominally continues. For if a bill should pass their house, there is no doubt of its validity, tho' every lord spiritual should vote against it; of which Selden and Sir Edward Coke give many instances: as, on the other hand, doubtless it would be equally good, if the lords temporal present were inferior to the bishops in number, and every one of those temporal lords gave his vote to reject the bill; though this Sir Edward Coke seems to doubt of.

2. The temporal lords consist of all the peers of the realm, (the bishops not being in strictness held to be such, but merely lords of parliament), by whatever title of nobility distinguished; dukes, marquises, earls, viscounts, or barons\*. Some of these fit by descent, as do all ancient peers; some by creation, as do all new-made ones; others, since the union with Scotland, by election, which is the case of the 16 peers, who represent the body of the Scots nobility. Their number is indefinite, and may be increased at will by the power of the crown: and once, in the reign of queen Anne, there was an instance of creating no less than 12 together; in contemplation of which, in the reign of king George I. a bill passed the house of lords, and was countenanced by the then ministry, for limiting the number of the peerage. This was thought by some to promise a great acquisition to the constitution, by restraining the prerogative from gaining the ascendant in that august assembly, by pouring in at pleasure an unlimited number of new-created lords. But the bill was ill relished, and miscarried in the house of commons, whose leading members were then desirous to keep the avenues to the other house as open and easy as possible.

The distinction of ranks and honours is necessary in every well-governed state: in order to reward such as are eminent for their services to the public, in a manner the most desirable to individuals, and yet without burthen to the community; exciting thereby an ambitious yet laudable ardour and generous emulation in others. And emulation, or virtuous ambition, is a spring of action which, however dangerous or invidious in a mere republic or under a despotic sway, will certainly be attended with good effects under a free monarchy; where, without destroying its existence, its excesses may be continually restrained by that superior power, from which all honour is derived. Such a spirit, when nationally diffused, gives life and vigour to the community; it sets all the wheels of government in motion, which, under a wise regulator, may be directed to any bene-

facial purpose; and thereby every individual may be made subservient to the public good, while he principally means to promote his own particular views. A body of nobility is also more peculiarly necessary in our mixed and compounded constitution, in order to support the rights of both the crown and the people, by forming a barrier to withstand the encroachments of both. It creates and preserves that gradual scale of dignity, which proceeds from the peasant to the prince; rising like a pyramid from a broad foundation, and diminishing to a point as it rises. It is this ascending and contracting proportion that adds stability to any government; for when the departure is sudden from one extreme to another, we may pronounce that state to be precarious. The nobility therefore are the pillars, which are reared from among the people, more immediately to support the throne; and, if that falls, they must also be buried under its ruins. Accordingly, when in the last century the commons had determined to extirpate monarchy, they also voted the house of lords to be useless and dangerous. And since titles of nobility are thus expedient in the state, it is also expedient that their owners should form an independent and separate branch of the legislature. If they were confounded with the mass of the people, and like them had only a vote in electing representatives, their privileges would soon be borne down and overwhelmed by the popular torrent, which would effectually level all distinctions. It is therefore highly necessary that the body of nobles should have a distinct assembly, distinct deliberations, and distinct powers from the commons. See also KING, NOBILITY, PARLIAMENT, COMMONS, and COMMONALTY.

As to the peculiar laws and customs relating to the house of lords: One very ancient privilege is that declared by the charter of the forest, confirmed in parliament 9 Hen. III.; viz. that every lord spiritual or temporal summoned to parliament, and passing thro' the king's forests, may, both in going and returning, kill one or two of the king's deer without warrant; in view of the forester if he be present, or on blowing a horn if he be absent; that he may not seem to take the king's venison by stealth.

In the next place, they have a right to be attended, and constantly are, by the judges of the court of king's-bench and common-pleas, and such of the barons of the exchequer as are of the degree of the coif, or have been made sergeants at law; as likewise by the king's learned counsel, being sergeants, and by the masters of the court of chancery; for their advice in point of law, and for the greater dignity of their proceedings. The secretaries of state, with the attorney and solicitor general, were also used to attend the house of peers, and have to this day (together with the judges, &c.) their regular writs of summons issued out at the beginning of every parliament, *ad tractandum et consilium impendendum*, though not *ad consentiendum*: but, whenever of late years they have been members of the house of commons, their attendance here hath fallen into disuse.

Another privilege is, that every peer, by licence obtained from the king, may make another lord of parliament his proxy, to vote for him in his absence: A privilege, which a member of the other house can

by

\* See Nobility.

Loretto. by no means have, as he is himself but a proxy for a multitude of other people.

Each peer has also a right, by leave of the house, when a vote passes contrary to his sentiments, to enter his dissent on the journals of the house, with the reasons for such dissent; which is usually styled his protest.

All bills likewise, that may in their consequences any way affect the rights of the peerage, are by the custom of parliament to have their first rise and beginning in the house of peers, and to suffer no changes or amendments in the house of commons.

There is also one statute peculiarly relative to the house of lords; 6 Ann. c. 23. which regulates the election of the 16 representative peers of North Britain, in consequence of the 22 and 23 articles of the union: and for that purpose prescribes the oaths, &c. to be taken by the electors; directs the mode of balloting; prohibits the peers electing from being attended in an unusual manner; and expressly provides, that no other matter shall be treated of in that assembly, save only the election, on pain of incurring a præmunire. See also the articles *NOBILITY* and *PEERS*.

LORETTO, a town of Italy, in the Marca or Marche of Ancona, with a bishop's see. It is small, but fortified; and contains the *casa santa*, or the house of Nazareth, in which they pretend Jesus Christ was brought up. They tell us, that it was carried by angels into Dalmatia, and thence to the place where it now stands. The inner part of this house or chapel is very old, but it is surrounded by a marble wall, and within a church built of free-stone. The famous lady of Loretto, who holds the infant Jesus in her arms, stands upon the principal altar: this statue is of cedar wood, three feet high; but her face can hardly be seen, on account of the smoke of the numerous lamps round about her. She is clothed with cloth of gold, set off with jewels; and the little Jesus is covered with a shirt. He holds a globe in his hand, and is adorned with rich jewels. There are prodigious numbers frequently go in pilgrimage to Loretto, particularly at Easter and Whitsuntide, among whom there are many of the first distinction. Every pilgrim, after having performed his devotion, makes the Virgin a present proportionable to his ability; whence it may be readily concluded, that this chapel must be full of immense riches.—Christina, queen of Sweden, made the Virgin a present of a crown of gold, worth above 100,000 crowns; and Isabella, infanta of Spain, sent her a garment which cost 40,000 ducats. Lewis XIII. of France, and his queen, sent her two crowns of gold, enriched with diamonds. Besides these crowns, they sent an angel of massy silver, holding in his hand the figure of the dauphin, of solid gold. The place where the governor resides stands near the church, and the ecclesiastics who are employed in it lodge in the same palace, where they receive the pilgrims of high distinction. As for the town itself, exclusive of the chapel, it is neither very considerable nor very agreeable; nor does it contain above 300 inhabitants, who are almost all shoemakers, taylor, or sellers of chaplets. The environs of this town are very agreeable, and in fine weather the high mountains of Croatia may be seen from hence. It is seated on a mountain, in E. Long. 13. 50. N. Lat. 43. 24.

LORIMERS, one of the companies of London, that make bits for bridles, spurs, and such like small iron ware. They are mentioned in statute 1 Rich. II. c. 12.—The word seems derived from the Latin word *lorum*, a thong.

LORME (Philibert de), one of the most celebrated architects of the 16th century, was born at Lyons. Queen Catharine de Medicis gave him the superintendence of buildings; and he had the direction of those of the Louvre, the Tuilleries, the castle of St Anet, St Germain, and other edifices erected by her orders. He wrote several books of architecture, which are esteemed; and died about the year 1577.

LORNE, a division of Argyleshire in Scotland, which gives the title of marquis to the duke of Argyle. It extends above 30 miles in length from north to south, and about nine at its utmost breadth; bounded on the east by Braidalbin; on the west, by the islands; on the north, by Lochaber; and is divided from Knapdale on the south, by Loch Etivich, on the banks of which stands the castle of Bergomarn, wherein the courts of justice were anciently held. This district, abounding with lakes, is the most pleasant and fertile part of Argyleshire, producing plenty of oats and barley. It once belonged to the ancient family of Mac Dougal, still residing on the spot; but devolved to the lords of Argyle, in consequence of a marriage with the heiress, at that time a branch of the Stuart family. The only place of note in this district is the castle of Dunstaffnage, or St Stephen's mountain, which formerly belonged to the kings of Scotland, some of whom are here interred: at present it is possessed by the duke of Argyle, and governed by an hereditary captain.

LORRAIN, a sovereign state of Europe, bounded on the north by Luxemburg and the archbishoprick of Treves, on the east by Alsace and the duchy of Deux Ponts, on the south by Franche Comté, and on the west by Champagne and the duchy of Bar. It is about 100 miles in length, and 75 in breadth; and abounds in all sorts of corn, wine, hemp, flax, rape-seed, game, and fish, with which it carries on some trade, and in general all the necessities of life. There are fine meadows and large forests, with mines of iron, silver, and copper, as also salt-pits. There are a great number of rivers; of which the principal are the Maële or Meuse, the Moselle, the Seille, the Meure, and the Sarre. It is divided into three parts; the duchy of Lorrain, properly so called, which was heretofore a sovereign state; the duchy of Bar, which formerly belonged to the dukes of Lorrain, but afterwards came under the government of France; and the third comprehends the three bishopricks of Metz, Toul, and Verdun, which have belonged to France ever since the year 1552. In 1733, the emperor of Germany being at war with France, this last got possession of the duchy of Lorrain; and when there was a peace made in 1735, it was agreed, that Stanislaus king of Poland, father-in-law to the king of France, should possess these duchies, and that after his death they should be united for ever to the crown of France. It was also then agreed, that Francis Stephen, duke of Lorrain, and the emperor's son-in-law, should have the grand duchy of Tuscany as an equivalent for Lorrain. After the death of the great duke of Tuscany, in 1737, king

Lorimers,  
Lorrain.



Lorrain,  
 ↓  
 Lothian.

Stanislaus and the duke of Lorrain took possession of their respective dominions, and the cessation was confirmed and guaranteed by a treaty in 1738. The inhabitants are laborious and valiant, and their religion is the Roman Catholic. They have but little trade with strangers, because they have no navigable rivers, and because they have all necessaries within themselves: but what little trade they have consists of corn and linen cloth. Nanci is the capital town.

LORRAIN (Robert le), an eminent sculptor, born at Paris in 1666. From his infancy, he made so rapid a progress in the art of designing, that at the age of 18 the celebrated Girardon intrusted him with the care of teaching his children and correcting his disciples. He committed to him also, in conjunction with Noulsson, the execution of the famous tomb of cardinal Richlieu in the Sorbonne, and his own tomb at St Landres in Paris. On his return from Rome, he finished several pieces at Marcilles, which had been left imperfect by the death of Mr Puget. He was received into the academy of Sculpture in 1701. His *chief d'œuvre* is Galatea, a work universally admired. Lorrain afterwards made a Bacchus for the gardens at Versailles, a Faun for those of Marly; and several bronzes, among which is an Andromeda; all in an excellent taste. This artist succeeded chiefly in heads; and more particularly in that of young girls, which he performed with incomparable delicacy and truth.

LORRAIN (Claude.) See CLAUD.

LOTEN (John), a good landscape-painter of the English school; though a native of Switzerland. His taste led him to solemn and dreary scenes, as landscapes accompanied with showers of rain, &c. and he seldom omitted to introduce oak-trees in his prospects: his landscapes are generally large, and he painted with nature, truth, and force. But the effect of his composition had been much greater if he had been less cold in his colouring: for the judicious eye is not pleased with the darkish tint that predominates in it.

LOTHIAN, a name given to three counties of Scotland, viz. Linlithgow-shire, Haddington-shire, and Edinburgh-shire. An account is given of Linlithgow shire, or west Lothian, under the article LINLITHGOW.

East-Lothian, or Haddington-shire, is bounded on the north by the Frith of Forth; on the south, by the hills of Lammermuir; and on the west, by the shire of Edinburgh or Mid Lothian. It is about 20 miles in length, and 12 in breadth; and is one of the most fruitful counties in Scotland, producing great quantities of wheat and all sorts of grain, well-watered, and plentifully supplied with fish, fowl, fuel, and all the necessaries of life. It abounds with towns, villages, and farms, interspersed with a great number of agreeable houses belonging to persons of rank and fortune. For cultivation, populousness, and fertility, this shire may vie with any tract of land in the island of Great Britain. Over and above the farming, which turns out to great account, the people towards the sea-coast employ themselves in the fishery, salt-making, and in foreign trade; and some of the more inland inhabitants engage in the linen and woollen manufactures. Lime-stone and coal are found in most parts of the country, and great numbers of sheep are fed on the hills of Lammermuir.

Edinburgh-shire, or Mid-Lothian, is 20 miles long, but varies in its breadth in different places from five to 16 miles. It is bounded on the east by East-Lothian; on the west, by the shire of Linlithgow; on the south, by Tweeddale; and on the north, by part of West-Lothian and the Frith of Forth. The aspect of the country is in general level and pleasant, interspersed with a few hills, that help to exhibit agreeable prospects. It is well watered with rivers, and shaded with woods. It produces plenty of coal, lime-stone, a soft black marble, and some copper ore. The soil, of itself fertile, is finely cultivated, and yields as plentiful harvests of excellent wheat as are found in any part of Great Britain. The whole shire is interspersed with noble houses and plantations belonging to noblemen and gentlemen of fortune. The farmers are master of the science of agriculture; and wealthy in consequence of their skill, some of them paying 500 l. of yearly rent. The country is well inhabited, and presents us with a good number of towns and populous villages. Along the sea-coast the common people subsist by fishing, and traffic in coals and salt, and some few carry on a smuggling commerce. Those in the inland are employed in farming, and some branches of the weaving manufacture. The sheriffalty of this shire is in the gift of the crown; and Edinburgh is a county in itself.

Mid-Lothian is adorned with a great number of elegant houses, which we cannot pretend to particularize; among others, the houses of the earls of Morton and Lauderdale, about six miles to the westward of Edinburgh, two elegant edifices, surrounded with parks agreeably planted with a variety of trees; and at a little distance the house of New-Linton, a delightful seat, where the late earl of Stair resided during his honourable recess from courts and corruption. Nor is it deficient in Roman antiquities. At Cramond, upon the Frith, four miles to the westward of Edinburgh, we see the remains of a great Roman station, in the estate of Sir John Inglish. Here several Roman altars have been found, and stones having inscriptions dug up, together with a great quantity of Roman coins, brass, silver, and gold. Great part of these, and many other curious pieces of antiquity, were collected by the late Sir John Clerk of Penicuik, one of the barons of the exchequer, a gentleman of considerable fortune, eminent for his taste and learning, whose country-house at Mavis Bank, in this county, is one of the most agreeable villas in all Scotland.

LOTION, is, strictly speaking, such washing as concerns beautifying the skin, by cleansing it of those deformities which a disordered blood throws upon it. Medicines of this kind, however, are for the most part insignificant, and sometimes very dangerous; the only proper method of treating these disorders is, by administering such medicines as tend to correct the morbid state of the constitution from whence they arise.

LOTTERY, a kind of public game at hazard, frequent in Britain, France, and Holland, in order to raise money for the service of the state; being appointed with us by the authority of parliament, and managed by commissioners appointed by the lords of the treasury for that purpose. It consists of several numbers

Lothian  
 Lottery.

numbers of blanks and prizes, which are drawn out of wheels, one of which contains the numbers, and the other the corresponding blanks or prizes.

The first English lottery we find mentioned in history, was drawn A. D. 1569. It consisted of 40,000 lots, at 10s. each lot: the prizes were plate; and the profits were to go towards repairing the havens of this kingdom. It was drawn at the west door of St Paul's cathedral. The drawing began on the 11th of January 1569, and continued incessantly drawing, *day and night*, till the 6th of May following; as Maitland, from Stowe, informs us in his History, Vol. I. p. 257. There were then only three lottery-offices in London. The proposals for this lottery were published in the years 1567 and 1568. It was at first intended to have been drawn at the house of Mr Dericke, her majesty's servant (*i. e.* her jeweller), but was afterwards drawn as above-mentioned.

Dr Rawlinson shewed the Antiquary Society, 1748, "A proposal for a very rich lottery, general without any blanks, containing a great number of good prizes, as well of redy money as of plate and certain sorts of merchandizes, having been valued and prised by the commandment of the queen's most excellent majestie's order, to the intent that such commodities as may chance to arise thereof after the charges borne may be converted towards the reparations of the havens and strength of the realme, and towards such other public good workes. The number of lots shall be foure hundred thousand, and no more; and every lott shall be the sum of tenne shillings sterling, and no more. To be filled by the feast of St Bartholomew. The shew of prizes are to be seen in Cheapside, at the sign of the Queene's Armes, the house of Mr Dericke, goldsmith, servant to the queene. Some other orders about it in 1567-8. Printed by Hen. Bynnenman."

"In the year 1612, king James, in special favour for the present plantation of English colonies in Virginia, granted a lottery, to be held at the west end of St Paul's; whereof one Thomas Sharples, a taylor of London, had the chief prize, which was 4000 crowns in fair plate." Baker's Chronicle.

In the reign of queen Anne, it was thought necessary to suppress lotteries, as nuisances to the public. Since that time, however, they have been licensed by an act of parliament. The following is an abstract of the last act for regulating Lottery-offices. It restrains any person from keeping an office for the sale of tickets, shares, or chances, or for buying, selling, insuring, or registering, without a licence; for which licence each office-keeper must pay 50l. to continue in force for one year, and the produce to be applied towards defraying the expences of the lottery. And no person is to be allowed to sell any share or chance less than a sixteenth, on the penalty of 50l. All tickets divided into shares or chances, are to be deposited in an office established in London by the commissioners of the treasury, who are to appoint a person to conduct the business thereof; and all shares are to be stamped by the said officer, who is to give a receipt for every ticket deposited with him. The numbers of all tickets so deposited are to be entered in a book, with the names of the owners, and the number of shares into which they are divided, and 2d. for each share is to be paid to the officer on depositing such tickets, who is

therewith to pay all expences incident to the office. All tickets deposited in the office to remain there three days after drawing. And any person keeping an office, or selling shares, or who shall publish any scheme for receiving moneys in consideration of any interest to be granted in any ticket in the said lottery, &c. without being in possession of such ticket, shall forfeit 500l. and suffer three months imprisonment. And no business is to be transacted at any of the offices after eight in the evening, except on the evening of the Saturday preceding the drawing. No person to keep any office for the sale of tickets, &c. in Oxford or Cambridge, on penalty of 20l.

LOTUS, in botany, a genus of the decandria order, belonging to the diadelphia class of plants. There are many species, but only five are usually cultivated in our gardens. 1. The tetragonolobus, or winged pea, hath trailing, slender, branchy stalks, about a foot long; garnished with trifoliate oval leaves; and from the axillas of the branches, large, papilionaceous red flowers, one on each footstalk; succeeded by tetraginous solitary pods, having a membranous wing or lobe, running longitudinally at each corner. It flowers in June and July, and the seeds ripen in autumn. 2. The creticus, or Cretan silvery lotus, hath a slender under-shrubby stalk, rising by support three or four feet high, ornamented with trifoliate, bright silvery leaves; and branches terminated by several yellow flowers succeeded by subternate pods. 3. The Jacobæus, or lotus of St James's island, hath upright herbaceous stalks branching two or three feet high, and, from the upper part of the branches, long slender footstalks, terminated each by three or five yellowish purple flowers, appearing most part of the summer and autumn, and succeeded by subternate pods filled with plenty of seeds. 4. The hirsutus, or hairy Italian lotus, hath upright hairy stalks branching a yard high; and terminated by heads of whitish hoary-cupped flowers appearing in June, which are succeeded by oval pods full of seed, which ripens in autumn. 5. The dorycnium, or white Austrian lotus, hath undershrubby smooth stalks, branching three or four feet high, and the branches terminated by aplyllous heads of small white flowers appearing in June, succeeded by short pods.

Culture, &c. The first species is a hardy annual, and is easily raised from seed sown any time from the month of February to May; the plants requiring no other culture than to be kept free from weeds. It was formerly cultivated as an esculent; for its young green seed-pods may be dressed and eat like-pease, or in the manner of kidney-beans. The other species may be propagated either by seeds or cuttings, but require to be kept in pots in the green-house during the winter-season.

LOVAGE, in botany. See LIGUSTICUM.

LOVE. See MORALS, n° 144.

The symptoms produced by this passion are as follow: The eye-lids often twinkle; the eyes are hollow, and yet appear as if full with pleasure: the pulse is not peculiar to the passion, but the same with that which attends solicitude and care. When the object of this affection is thought of, particularly if the idea is sudden, the spirits are confused, the pulse changes, and its force and time are very variable: in some instances, the person is sad and watchful; in others, the person,

Love-apple  
Louth.

not being conscious of his state, pines away, is slothful, and regardless of food; tho' the wiser, when they find themselves in love, seek pleasant company and active entertainments. As the force of love prevails, sighs grow deeper; a tremor affects the heart and pulse; the countenance is alternately pale and red; the voice is suppressed in the fauces; the eyes grow dim; cold sweats break out; sleep absents itself, at least until the morning; the secretions become disturbed; and a loss of appetite, a hectic fever, melancholy, or perhaps madness, if not death, constitutes the sad catastrophe. On this subject the curious may consult *Ægineta*, lib. iii. cap. 17. *Oribat. Synop. lib. viii. cap. 9.* or a treatise professedly written on love, as it is a distemper, by James Ferrard, Oxford, printed 1640.

LOVE-Apple. See SOLANUM.

LOVENTINUM, or LUENTINUM, (anc. geog.), a town of the Demeta in Britain, near the mouth of the Tuerobis or Tivy. Supposed to have been afterwards swallowed up by an earthquake, and to have stood where is now the lake called *Lin Savatan* in Brecknockshire.

LOUIS, or *Knights of St Louis*, the name of a military order in France, instituted by Lewis XIV. in 1693. Their colours are of a flame colour, and pass from left to right; the king is their grand-master. There are in it eight great crosses, and 24 commanders; the number of knights is not limited. At the time of their institution, the king charged his revenue with a fund of 300,000 livres for the pensions of the commanders and knights.

LOUIS, *Lewis, Louis d'or, or Lewidore*, a French coin, first struck in 1640, under the reign of Louis XIII. and which has now a considerable currency. See MONEY-Table.

LOUISIANA, a country in North America, bounded on the south by the gulph of Mexico, on the east by the river Mississippi, on the west by New Mexico, and on the north by an unknown country. It extends from the 29th to the 40th degree of north latitude, and from about the 80th to the 96th or 97th degree west longitude from London. The climate of Louisiana varies according to the latitudes. The southern parts are not so hot as those parts of Africa which lie under the same parallel, and the northern parts are colder than the countries of Europe at the same distance from the pole: the causes of which are supposed to be the thick forests which over-run the country, and the great number of rivers; the former preventing the sun from heating the earth, and the latter supplying it with moist vapours; besides the cold winds which come from the north over vast tracts of land. They have bad weather; but it never lasts long, for the rain generally falls in storms and sudden showers; the air is wholesome, the inhabitants healthy, and they who are temperate live to a great old age. The country is extremely well watered; and almost all the rivers that run through it fall into the Mississippi, which discharges itself into the gulph of Florida.

LOUSE, in zoology. See PEDICULUS and LICIE.

LOUSY DISEASE. PHTHIRIASIS.

LOUTH, a county in the eastern part of Ireland, which extends in the form of a bow or half-moon, on the side of the ocean, being much longer than it is broad; it is bounded on the south and south-west by

the county of East-Meath, on the north-west by Monaghan, on the north by Armagh, and on the north-east by the bay of Carlingford, which parts it from the county of Down; it is watered by several small rivers which fall into the sea, and its south frontiers are watered by the river Boyne, which renders it fruitful and rich. The most considerable places are Drogheda, Ardes, Dundalk, and Carlingford.

LOUVAIN, a city in the Austrian Netherlands, in the province of Brabant, pleasantly seated on the river Dyle, in a plentiful and agreeable country. The walls are about eight or nine miles in circumference; but they include several fields and vineyards. The castle stands on a high hill, surrounded with fine gardens, and has a charming prospect all over the country. This town contains nine market-places, 14 water-mills, 126 streets, 16 stone bridges, and several handsome palaces. The town-house is a venerable old building, adorned with statues on the outside; and the churches are very handsome, particularly the collegiate church of St Peter; but the principal ornament is the university, there being 60 colleges, which have two courts each; the students in divinity constantly wear gowns and caps, but the rest only at public exercises. The English have a nunnery here, which is reckoned the best in the Netherlands. This town was taken in the year 1746, by the French. E. Long. 4. 40. N. Lat. 51. 12.

LOW-BELL, in birding, a name given to a bell, by means of which they take birds in the night, in open champaign countries, and among stubble, in October. The method is to go out about nine o'clock at night in a still evening, when the air is mild, and the sun does not shine. The low-bell should be of a deep and hollow sound, and of such a size that a man may conveniently carry it in one hand. The person who carries it is to make it toll all the way he goes, as nearly as may be, in that manner in which the bell on the neck of a sheep tolls as it goes on and feeds. There must also be a box made like a large lantern, about a foot square, and lined with tin, but with one side open. Two or three great lights are to be set in this; and the box is to be fixed to the person's breast, with the open side forwards, so that the light may be cast forward to a great distance. It will spread as it goes out of the box; and will distinctly shew to the person that carries it whatever there is in the large space of ground over which it extends, and consequently all the birds that roost upon the ground. Two persons must follow him who carries the box and bell, one on each side, so as not to be within the reach of the light to shew themselves. Each of these is to have a hand-net of about three or four feet square, fastened to a long stick or pole; and on whichever side any bird is seen at roost, the person who is nearest is to lay his net over it, and take it with as little noise as possible. When the net is over the bird, the person who laid it is not to be in a hurry to take the bird, but must stay till he who carries the light is got beyond it, that the motions may not be discovered. The blaze of the light and the noise of the bell terrify and amaze the birds in such a manner that they remain still to be taken; but the people who are about the work must keep the greatest quiet and stillness that may be.

Some people are fond of going on this scheme alone. The person then fixes the light-box to his breast,

Louvain.  
Low-bell.



Lower  
Lowth.

breast and carries the bell in one hand and the net in the other; the net in this case may be somewhat smaller, and the handle shorter. When more than one are out at a time, it is always proper to carry a gun; as it is no uncommon thing to spy a hare when on this expedition.

LOWER (Richard) an eminent English physician in the 17th century, was born in Cornwall, and educated at Westminster-school and Oxford. He entered on the physic line; and practised under Dr Thomas Willis, whom he instructed in some parts of anatomy, especially when the latter was writing his *Cerebri anatome*. He, with Dr Willis, in 1674, discovered the medicinal waters at Ashop in Northamptonshire; which, upon their recommendations, became very much frequented. In 1666, he followed Dr Willis to London; practised physic under him; and became fellow of the royal society, and of the college of physicians. In 1669, he published his *Tractatus de corde*; and, after the death of Dr Willis in 1675, was esteemed the most eminent physician in London. Upon the breaking out of the Popish plot in 1678, says Mr Wood in his *Athene Oxoniensis*, he closed with the Whigs, supposing that party would carry all before them; but, being mistaken, he lost his credit and practice. He died in 1691.

LOWERING, among distillers, a term used to express the debasing the strength of any spirituous liquor, by mixing water with it. The standard and marketable price of these liquors is fixed in regard to a certain strength in them called *proof*; this is that strength which makes them when shook in a vial, or poured from on high into a glass, retains a froth or crown of bubbles for some time. In this state, spirits consist of about half pure or totally inflammable spirit, and half water; and if any foreign or home spirits are to be exposed to sale, and are found to have that proof wanting, scarce any body will buy it till it has been distilled again and brought to that strength; and if it is above that strength, the proprietor usually adds water to it to bring it down to that standard. See the article *PROOF*.

There is another kind of lowering among the retailers of spirituous liquors to the vulgar, by reducing it under the standard-proof. Whoever has the art of doing this without destroying the bubble-proof, which is easily done by means of some addition that gives a greater tenacity to the parts of the spirits, will deceive all that judge by this proof alone. In this case, the best way to judge of liquors is by the eye and tongue, and especially by the instrument called *HYDROMETER*.

LOWTH (William), a learned divine, was the son of an apothecary born at London in 1661, and took his degrees at Oxford. His eminent worth and learning recommended him to Dr Mew bishop of Winchester, who made him his chaplain, gave him two livings in Hampshire, and conferred on him a prebend in the cathedral of Winchester. He acquired an unusual share of critical learning; but the most valuable part of his character was that which was least conspicuous to the world; that of a pious, diligent, and hospitable parish-priest. He published, &c. A vindication of the divine authority and inspiration

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of the Old and New Testament. 2. Directions for the profitable reading of the Holy Scripture. 3. Commentaries on the prophets; and other works.

LOXIA, in zoology; the name of a genus of birds of the order of passerines: the distinguishing characters of which are, that the tongue is plain, equal, and whole; the beak large, thick, and short, crooked and convex both ways. There are 48 species, principally distinguished by the colour. The following are natives or visitors of Britain.

1. The coccythraustes, or haw-grosbeak, visits us only at uncertain times, and is not regularly migrant. They feed on berries; and even on kernels of the strongest stones, such as those of cherries and almonds, which they crack with the greatest facility: their bills are well adapted to that work, being remarkably thick and strong. Mr Willughby tells us, they are common in Germany and Italy; that in the summer they live in woods, and breed in hollow trees, laying five or six eggs; but in the winter they come down into the plains. The length of this species is seven inches; the breadth, 13: the bill is of a funnel shape; strong, thick, and of a dull pale pink colour; the breast and whole under-side is of a dirty flesh colour; the neck ash-coloured; the back and coverts of the wings of a deep brown, those of the tail of a yellowish bay: the greater quill-feathers are black, marked with white on their inner webs. The tail is short, spotted with white on the inner sides. The legs flesh-colour. The great particularity of this bird, is the form of the ends of the middle quill-feathers; which Mr Edwards justly compares to the figure of some of the ancient battle-axes: these feathers are glossed over with a rich blue; but are less conspicuous in the female.

2. The enucleator, or pine-grosbeak, is common to Hudson's Bay, Sweden, and Scotland. Mr Pennant observed them flying above the great pine-forests of Invercauld in Aberdeenshire, and imagines they breed there. They feed on the seeds of the pine. Linnæus says, they sing in the night. It is near twice the size of the bullfinch. The bill is strong, dusky, forked at the end; less thick than that of the common bullfinch: head, back, neck, and breast, of a rich crimson: the bottoms of the feathers ash-colour: the quill-feathers and tail dusky; their exterior edges, of a dirty white: legs black: length, nine inches and a half. There seems an agreement in colours, as well as food, between this species and the cross-bill.

3. The curvirostra, or cross-bill. There are two varieties of this bird: Mr Edwards has very accurately figured the lesser, which is seen frequently; the other is very rare. These birds, like the former, are inconstant visitants to this island: in Germany and Switzerland, they inhabit the pine forest, and breed in those trees as early as the months of January and February. They feed on the seeds of the cones of pines and firs; and are very dexterous in scaling them, for which purpose the cross structure of the lower mandible of their bill is admirably adapted: they feed also on hemp-seed, and the pips or kernels of apples, and are said to divide an apple with one stroke of the bill to get at the contents. Linnæus says, that the upper mandible of this bird is moveable; but, on examination, Mr Pennant could not discover its structure to

differ from that of others of the genus. These birds change their colours, or rather the shades of the colours: that is, the males which are red, vary at certain seasons to deep red, to orange, or to a sort of a yellow; the females, which are green, alter to different varieties of the same colour.

4. The pyrrhula, or bullfinch. The wild note of this bird is not in the least musical; but when tamed it becomes remarkably docile, and may be taught any tune after a pipe, or to whistle any notes in the justest manner: it seldom forgets what it has learned; and will become so tame as to come at call, perch on its master's shoulders, and (at command) go through a difficult musical lesson. They may be taught to speak, and some thus instructed are annually brought to London from Germany.—The male is distinguished from the female by the superior blackness of its crown, and by the rich crimson that adorns the cheeks, breast, belly, and throat of the male; those of the female being of a dirty colour: the bill is black, short, and very thick: the head large: the hind part of the neck and the back are grey: the coverts of the wings are black; the lower crossed with a white line: the quill-feathers dusky, but part of their inner webs white: the coverts of the tail and the vent-feathers white: the tail black.

In the spring these birds frequent our gardens; and are very destructive to our fruit-trees, by eating the tender buds. They breed about the latter end of May, or beginning of June, and are seldom seen at that time near houses, as they choose some very retired place to breed in. They are sometimes wholly black; and there are instances of their changing to this colour after they were full grown, and of recovering their natural colour in another year. Birds fed on hempseed alone are most apt to change their colour in this manner.

LOYOLA (Ignatius). See IGNATIUS.

LOZENGE, in heraldry; a four-cornered figure, resembling a pane of glass in old casements. See HERALDRY, p. 3597, col. 1. Tho' all heralds agree, that single ladies are to place their arms on lozenges, yet they differ with respect to the causes that gave rise to it. Plutarch says, in the life of Theseus, that in Megara, an ancient town of Greece, the tomb-stones, under which the bodies of the Amazons lay, were shaped after that form; which some conjecture to be the cause why ladies have their arms on lozenges. *S. Petra Sancta* will have this shield to represent a cushion, whereupon women used to sit and spin, or do other housewifery. Sir J. Ferne thinks it is formed from the shield called *tesfera*, which the Romans finding unfit for war, did allow to women to place their ensigns upon, with one of its angles always uppermost.

LOZENGES, among jewellers, are common to brilliant and rose diamonds. In brilliants, they are formed by the meeting of the skill and star facets on the bezil; in the latter, by the meeting of the facets in the horizontal ribs of the crown. See FACETS.

LUBEC, a city and port-town of Germany, in the circle of Lower Saxony and duchy of Holstein, in E. Long. 10. 35. N. Lat. 54. 20. It stands at the conflux of several rivers, the largest of which is the Trave, 12 miles from the Baltic, where it has a fine

harbour, and 40 north-east of Hamburg. By the Seeckenitz, another of those rivers, it has a communication with the Elbe, and consequently with the German ocean. The city lies on the side of a hill, with the Trave, increased by the Stecknitz on the one side, and the Wacknitz on the other; and is strongly fortified with bastions, moats, walls, and ramparts; the last of which are planted with trees, and form an agreeable walk. Lubec being formerly the chief of the Hanse towns, was very powerful, in consequence of the vast trade it carried on; but a great part of that trade is now transferred to Hamburg: however, it is still said to employ 150 of its own ships, and has a great share of the Baltic trade. It is about two miles in length, and more than one in breadth. The houses are all of stone, but old-fashioned. Several of the streets have on each side rows of lime-trees, with canals in the middle, like those of Holland. The public structures consist of the ancient cathedral of the bishopric of Lubec, and several other Lutheran churches; a nunnery for 22 ladies, with an abbess and prioress; a poor-house, an alms-house, and house of correction; an orphan-house; an hospital dedicated to the Holy Ghost; a house in which poor travellers are entertained three days, and then sent forward with a pass; but such as happen to be sick, are provided with all necessaries, till they recover or die; the city-armoury, a grammar-school of seven classes, the Calvinist church, and the Popish chapel. The deputies of the Hanse-towns used to meet here formerly in the town-house. An alliance still subsists between Lubec, Hamburg, and Bremen; and these cities, under the name of *Hanse-towns*, negotiate treaties with foreign powers. Here are divers manufactures, and the city's territory is about 60 miles in compass. In the diet of the empire Lubec is possessed of the third seat among the Rhenish imperial cities; and among those of the circle, has the first. In the matricula, its assessment is 480 florins, and to the chamber of Wetzlar it pays 557 rix-dollars and 88 kruitzers. The city is a republic within itself, and both makes and executes laws in regard to civil and criminal matters, &c. A father and son, or two brothers, cannot be in the regency at the same time. The famous league of the Hanse-towns was begun here in 1164. This city had its charter of privileges from the emperor Frederic II. Formerly it carried on wars, both offensive and defensive, for several years, not only against the dukes of Mecklenburg, but against the kings of Sweden and Denmark; particularly in 1428, when it fitted out 250 ships of force against Eric X. king of Denmark. There are about 20 churches in Lubec, with lofty steeples or spires. The Trave brings ships of burden into the very heart of the city; but the largest unload at Travemunde, i. e. the mouth of the Trave, eight or ten miles distant. Formerly it is said to have employed no less than 600 ships. In the famous cellar here, it is said there is wine 200 years old. The church of St Mary's, a noble lofty pile, is supported by tall pillars, all of one stone each, and has a high spire, covered with gilt lead. The town's garrison consists of about 700 or 800 men. The revenue of its Lutheran bishop, though he is a prince of the empire, is said not to exceed 3000 pounds.

LUBEN, a city of Germany, in the marquisate of Lower Lusatia. It is situated on the river Spree, and is the capital of a small circle of the same name. It is the seat of the diets, and of the chief tribunals and offices; and has several churches, with a noble land-house and hospital. E. Long. 14. 25. N. Lat. 52. 0.

LUBIENIETSKI (Stanislaus), a Popish gentleman, descended from a noble family, and born at Cracow in 1623, was educated by his father with great attention. He became a celebrated Socinian minister; and took great pains to obtain a toleration from the German princes for his Socinian brethren. His labours, however, were ineffectual; being himself persecuted by the Lutheran ministers, and banished from place to place; until at length he was banished out of the world, with his two daughters, by poison, his wife narrowly escaping, in 1675. We have of his writing, *A history of the reformation in Poland; A treatise on comets*; with other works in Latin.

LUBIN (Eilhard), was professor of poetry in the university of Rostock in 1595; and ten years after, was promoted to the professorship of divinity. He wrote notes on Anacreon, Juvenal, Persius, &c. and several other works; but that which made the most noise is a Treatise on the nature and origin of evil, intitled, *Phosphorus de causa prima et natura mali*, printed at Rostock in 1596; in which we have a curious hypothesis to account for the origin of moral evil. He supposed two co-eternal principles; not *matter* and *vacuum*, as Epicurus did; but God, and *Nothing*. This being published against by Grawer, was defended by Lubin; but after all, he is deemed better acquainted with polite literature than with divinity. He died in 1621.

LUBLIN, a handsome and considerable town of Poland, capital of the palatinate of the same name, with a citadel, a bishop's see, an university, and a handsome Jewish synagogue. Here the judicial courts for all Poland are held. It has three fairs, frequented by merchants from all nations. It is seated on the river Bystrza. E. Lon. 22. 31. N. Lat. 51. 26.

LUCANUS (Marcus Annæus), a Latin poet, born at Corduba in Spain, about A. C. 39. He was the son of Annæus Mela, brother to Seneca, and of Acilia, daughter of Lucanus a very famous orator. When he was scarcely 14 years of age, he declaimed with applause, both in Greek and Latin; and became the rival of Persius. Nero, charmed with his wit, made him *augur* and *questor* before the due age; but at last Nero disparaging his verses, he was so offended at it, that he engaged himself in Piso's conspiracy; for which he had his veins cut, as his uncle Seneca had before him, A. C. 65. He wrote several poems; but we have none remaining beside his *Pharsalia*, of which an excellent English version has been given by Mr Nicholas Rowe.

LUCAR DE BARRAMEDA (St.), an handsome and considerable town of Spain, with a very good harbour, well defended, in Andalusia. It was once the greatest port in Spain, before the galleons unloaded their treasure at Cadiz. It is seated at the mouth of the river Guadalquivir. W. Long. 6. 5. N. Lat. 36. 40.

LUCAR de Guadiana (St.), a strong town of Spain,

in Andalusia, on the confines of Algarve; seated on the river Guadiana, with a little harbour. W. Long. 5. 59. N. Lat. 37. 32.

LUCAR la Mayor (St.), a small town of Spain, in Andalusia, with the title of a duchy. It is seated on the river Guadiana, in W. Long. 6. 32. N. Lat. 37. 21.

LUCAS (Van Leyden), an excellent painter and engraver, was thus named from the place of his birth, he being born in Leyden in 1494. He was at first a disciple of his father, a painter of some eminence, and afterwards of Cornelius Engelbert; and was greatly admired in the Netherlands for his skill in painting and engraving. He took much pains with his works, and was a great emulator of Albert Durer; with whom he at length became so intimate, that they drew each other's picture: and indeed their style and manner have in all respects so close a resemblance, that it seems as if they had been both animated with the same soul. He lived and dressed with great magnificence; and died in the year 1533.

LUCAS (Richard), D. D. a learned English divine, was born in 1648, and studied at Oxford; after which he entered into holy orders, and was for some time master of the free school at Abergavenny. Being esteemed an excellent preacher, he became vicar of St Stephen's, Coleman-street, in London, and lecturer of St Olave's, in Southwark. He was doctor of divinity; and in 1696, was intitled prebendary of Westminster. His fight began to fail him in his youth; but he totally lost it in his middle age. He was greatly esteemed for his piety and learning; and published several works, particularly, 1. *Practical Christianity*. 2. *An inquiry after happiness*. 3. *Several sermons*. 4. *A Latin translation of the whole duty of man*. He died in 1715.

LUCCA, a small republic of Italy on the coast of the Mediterranean, between the territory of Genoa on the west, Modena on the north, and Tuscany on the east. According to Keyser, it is only about 30 miles in circumference, but is exceedingly fertile and populous. It contains, besides the city of Lucca, 15 ovillages. The number of inhabitants are computed at 120,000. The government is lodged in a gonfalonier, whose power is much the same with that of the doges of Venice and Genoa. He is assisted by nine counsellors; but the power of all the ten continues only for two months; during which time they live in the state-palace, and at the public expence. They are chosen out of the great council, which consists of 240 nobles; but even this council is changed by a new election every two years. The revenues of the republic are about 400,000 scudi or crowns; out of which they maintain 500 men by way of regular force, and 70 Swifs as a guard to their acting magistrates. The city of Lucca is situated in a plain, terminating in most delightful eminences, adorned with villas, summer houses, corn-fields, and plantations of every kind; so that nothing either for use or pleasure is here wanting. The city, which is about three Italian miles in circumference, has regular well lined fortifications; and its streets, though irregular, are wide, well paved, and full of handsome houses. The number of its inhabitants are computed to be above 40,000; and they carry on large manufactures, especially of silk-Ruffs. Lucca has a bishop, who enjoys several extraordinary



privileges; and its cathedral is Gothic. The city stands in E. Long. 11. 27. N. Lat. 43. 52.

LUCERIA, (anc. geog.), a town of Apulia in Italy; which in Strabo's time still exhibited marks of Diomed's sovereignty in those parts. Ptolemy has *Nuceria*; whether from milkake, or the custom of his time, uncertain. Now *Nocera de Pagani*, in the kingdom of Naples. E. Long. 15. 0. N. Lat. 40. 40.

LUCERNE, in botany. See MEDICAGO. For the culture of this plant, see AGRICULTURE, n° 137.

LUCIA (St), one of the Caribbee Islands in the West-Indies, about 22 miles long, and 11 broad, the middle of it lying in N. Lat. 39. 14. W. Long. 27. 0. It was first settled by the French in 1650; but was reduced by the English in 1664, who evacuated it in 1666. The French immediately re-settled the island, but were again driven away by the Caribbs. As soon as the savages were gone, the former inhabitants returned, but only for a short time; for being afraid of falling a prey to the first privateer that should visit their coasts, they removed either to other French settlements that were stronger, or which they might expect to be better defended. There was then no regular culture or colony at St Lucia; it was only frequented by the inhabitants of Martinico, who came thither to cut wood, and to build canoes, and who had who had considerable docks on the island. In 1718 it was again settled by the French; but four years after, it was given by the court of London to the duke of Montagu, who was sent to take possession of it. This occasioned some disturbance between the two courts; which was settled, however, by an agreement made in 1731, that, till the respective claims should be finally adjusted, the island should be evacuated by both nations, but that both should wood and water there. This precarious agreement furnished an opportunity for private interest to exert itself. The English no longer molested the French in their habitations; but employed them as their assistants in carrying on with richer colonies a smuggling trade, which the subjects of both governments thought equally advantageous to them. This trade has been more or less considerable till the treaty of 1763, when the property of St Lucia was secured to the crown of France. After that time the colony flourished considerably. In the beginning of the year 1772, the number of white people amounted to 2018 (souls, men, women, and children; that of the blacks to 663 free-men, and 12,795 slaves. The cattle consisted of 928 mules or horses, 2070 head of horned cattle, and 3184 sheep or goats. There were 38 sugar-plantations, which occupied 978 pieces of land; 5,395,389 coffee-trees; 1,321,600 cocoa plants; and 367 plots of cotton. There were 706 dwelling places. The annual revenue at that time was about 175,000*l.* which, according to the abbé Raynal, must have increased one-eighth yearly for some time. It was taken by the British fleet under admirals Byron and Barrington, in the year 1778.

The soil of St Lucia is tolerably good, even at the sea-side; and is much better the farther one advances into the country. The whole of it is capable of cultivation, except some high and craggy mountains which bear evident marks of old volcanoes. In one deep

valley there are still eight or ten ponds, the water of which boils up in a dreadful manner, and retains some of its heat at the distance of 6000 toises from its reservoirs. The air in the inland parts, like that of all other uninhabited countries, is foul and unwholesome; but grows less noxious as the woods are cleared and the ground laid open. On some parts of the sea-coast, the air is still more unhealthy, on account of some small rivers which spring from the foot of the mountains, and have not sufficient slope to wash down the sands with which the influx of the ocean flows up their mouths, by which means they spread themselves into unwholesome marshes on the neighbouring grounds.

LUCIA (St), a high and mountainous island of Africa, and one of those of Cape Verde, is about nine leagues long, and lies in the latitude of 16° 18' N. according to the English geographers; but according to all others, it is a degree farther to the northward. On the east-south-east side is a harbour, with a bottom and shore of white sand; but its best road is opposite to St Vincents to the south-west, where there are at least 20 fathoms of water. On the west side there is no water: it abounds with goats, sea and land fowl, tortoises, &c. but whether it hath any inhabitants is not certainly known.

LUCIAN, a celebrated Greek author in the first century, was born at Samosata, of obscure parents, in the reign of the emperor Trajan. He studied law, and practised some time as an advocate; but growing weary of the wrangling oratory of the bar, he commenced rhetorician. He lived to the time of Marcus Aurelius, who made him regiller of Alexandria in Egypt; and, according to Suidas, he was at last worried by dogs. Lucian was one of the finest wits in all antiquity. His *Dialogues*, and other works, are written in Greek. In these he has joined the useful to the agreeable, instruction to satire, and erudition to elegance; and we every-where meet with that fine and delicate railery which characterises the Attic taste.—Those who censure him as an impious scoffer at religion, have reason on their side, if religion consisted in the theology of the Pagan poets, or in the extravagant opinions of philosophers; for he perpetually throws such ridicule on the gods and philosophers, with their vices, as inspires hatred and contempt for them; but it cannot be said that he writes any-where against an over-ruling providence.

LUCIFER, according to the poets, was the son of Jupiter and Aurora: in astronomy, Lucifer is the bright planet Venus, which either goes before the sun in the morning, and is our morning-star; or in the evening follows the sun, and then is called *Hesperus*, or the evening-star.

LUCILIUS (Caius), a Roman knight, and a Latin poet, was born at Suessa in Italy, about 140 B. C. He served under Scipio Africanus in the war with the Numantines; and was in great favour with that celebrated general, and with Lælius. He wrote 30 books of satires, in which he lashed several persons of quality very sharply. Some learned men ascribe the invention of satire to him; but M. Dacier has maintained, with great probability, that Lucilius only gave a better turn to that kind of poetry, and wrote it with more wit and humour than his predecessors Ennius and Pa-

Lucina  
Lucullus.

cuvius had done. His fragments have been carefully collected by Francis Douza at Leyden in 1599, with notes. But they require still to be better illustrated by some learned critic.

LUCINA, a goddess among the Romans, who presided over women in labour. Some take her to be Diana, others Juno. She is called *Lucina*, because she brought children to the light; from the Latin word *lux*, "light."

LUCIUS, in ichthyology. See ESOP.

LUCONIA. See MANILA.

LUCOPHEREA, in ichthyology. See PERCA.

LUCRETIA, the famous Roman matron, wife of Collatinus, and the cause of the revolution in Rome from a monarchy to a republic: this lady being ravished by Sextus, the eldest son of Tarquin king of Rome, stabbed herself, 509 B. C. The bloody point, with her dead body exposed to the senate, was the signal of Roman liberty; the expulsion of the Tarquins, and abolition of the regal dignity, was instantly resolved on, and carried into execution.

LUCRETIVS, or TITUS LUCRETIVS CAIUS, one of the most celebrated of the Latin poets, was born of an ancient and noble Roman family, and studied at Athens, where he became one of Epicurus's sect. He acquired great reputation by his learning and eloquence; but in the flower of his age fell into a frenzy, occasioned by a philtre given him by his wife, who was distractedly fond of him. Lucretius, during the intervals of his madness, put Epicurus's doctrines into verse, and composed his six books *De rerum natura*, which are still extant. It is said that he killed himself in a fit of madness, in the 54th year before the Christian era, when 51 years old. The most correct edition of Lucretius is that of Simon de Coline. The cardinal de Polignac has refuted Lucretius's arguments in his excellent Latin poem intitled *Anti-Lucretius*. His poem *De rerum natura* has been translated into English by Mr Creech.

LUCRINUS LACUS (anc. geogr.), a lake of Campania between Baiae and Puteoli, famous for its oysters, (Horace, Martial, Juvenal): *Lucrinenses* (Cicero), the people dwelling on it. Now a perfect bay since the earthquake in 1538.

LUCULLUS (Lucius Licinius), a Roman general, celebrated for his eloquence, his victories, and his riches. In his youth, he made a figure at the bar; and being afterwards made quaestor in Asia, and praetor in Africa, governed those provinces with great moderation and justice. Scarce was he known as a military man, when he twice beat the fleet of Amilcar, and gained two great victories over him. His happy genius was greatly improved by study; for he employed his leisure in reading the best authors on military affairs. Being made consul with Anrelus Cotta, during the third war with Mithridates king of Pontus, he was sent against this prince: and this expedition was attended with a series of victories, which did him less honour than an act of generosity towards his colleague; who, willing to take advantage of his absence to signalize himself by some great exploit, hastened to fight Mithridates; but was defeated, and shut up in Calcedonia; where he must have perished, if Lucullus, sacrificing his resentment to the pleasure of saving a Roman citizen, had not flown to his assistance, and

Lucus  
Ludlow.

difengaged him. All Pontus then submitted to Lucullus; who being continued in his government of Asia, entered the territories of Tigranes, the most powerful king in Asia. That prince marched with a formidable army against Lucullus: who defeated him with a handful of men, and killed great numbers of his forces; took Tigranocertes, the capital of his kingdom; and was ready to put an end to the war, when the intrigues of a tribune got him deposed, and Pompey nominated in his room.

Lucullus having brought home prodigious riches, now gave himself up to excessive luxury; and his table was served with a profusion till that time unknown. He brought from the East a great number of books, which he formed into a library, and gave admittance to all men of learning, who frequented it in great numbers. Toward the end of his life, he fell into a kind of madness; and Lucullus, his brother, was appointed his guardian. He is said to have been the first who brought cherries into Europe, having brought the grafts from the kingdom of Pontus.

LUCUS, in general, denotes a wood or grove sacred to a deity; so called a *lucendo*, because a great number of lights were usually burning in honour of the god, (Isidorus); a practice common with idolaters, as we learn from Scripture: hence Homer's *αγλαα αλαρε*.

LUD, a British king mentioned in our old chronicles, and said to have reigned about the year of the world 3878. He is reported to have enlarged and walled about *Troy novant*, or New Troy, where he kept his court, and made it his capital. The name of *London* is hence derived from *Lud's town*; and *Ludgate*, from his being buried near it: but this is only one among many other derivations of the name of *London*; which are at least equally probable. See LONDON.

LUDIUS, a celebrated painter, lived in the reign of Augustus Cæsar, and excelled in grand compositions. He was the first who painted the fronts of houses in the streets of Rome; which he beautified with great variety of landscapes, and many other different subjects.

LUDLOW (Edmund), son of Sir Henry Ludlow, was born at Maidenhead, and educated in Trinity-college, Oxford. His father opposing the king's interest, Mr Ludlow joined with the same party, and was present at the battle of Edgehill as a volunteer under the earl of Essex. Upon the death of his father, he was chosen knight of the shire for Wilts, and obtained the command of a regiment of horse for the defence of that county. He was one of king Charles I.'s judges: after whose death he was sent by the parliament into Ireland, in quality of lieutenant-general of the horse; which employment he discharged with diligence and success till the death of the lord-deputy Ireton, when he acted for some time as general, though without that title; Cromwell, who knew him to be sincerely in the interest of the commonwealth, always finding out some pretext to hinder the conferring of that character upon him. The last stroke had been given by Ludlow to the Irish rebellion, if the usurpation of Cromwell had not prevented it. Under his power he never acted; and though Cromwell used his utmost efforts, he remained inflexible. After Cromwell's death, he endeavoured to restore the commonwealth;

Ludlow,  
Ludolph.

wealth; but Charles II. being recalled, he thought proper to conceal himself, and escaped into Switzerland, where he settled. After the revolution, he came over into England, in order to be employed in Ireland against king James: but appearing publicly in London, it gave great offence; and an address was presented by Sir Edward Seymour to king William III. for a proclamation in order to apprehend colonel Ludlow, attainted for the murder of king Charles I. Upon this he returned to Switzerland, where he died. During his retirement in Switzerland, he wrote his Memoirs.

LUDLOW, a town of Shropshire in England, situated in W. Long. 2. 45. N. Lat. 52. 28. It stands at the conflux of the Teme and Corve; and had formerly a strong castle, inclosed by a wall a mile in compass. The president of the council of the marches, established by Henry VIII. generally kept his courts in it, by which the town was much benefited, these courts not having been abolished till the 1st of William and Mary. Its neighbourhood to Wales makes it a great thoroughfare, and engages many of the Welch to send their children of both sexes to it for education. It was incorporated by Edward IV. and among other privileges has that of trying and executing criminals within itself. It is one of the neatest towns in England, with walls, and seven gates. From the castle on the top of the hill on which the town stands, is a most delightful prospect. In an apartment of the outgatehouse of the palace, Samuel Butler is said to have written the first part of *Hudibras*. Here Arthur, elder brother to Henry VIII. died, and was buried in the choir of the church. Without the town, on the north-side, stood anciently a rich priory; of which there are hardly any remains. The river Teme here has a good bridge over it, and dams or weirs across it. In the church are some old monuments of the lords president, &c. The neighbouring country is exceeding pleasant, especially that part called *Corve's Dale*, or the valley along the *Corve*.

LUDOLPH (Job), a very learned writer of the 17th century, was born at Erfurt in Thuringia. He travelled much, and was master of 25 languages; visited libraries, searched after natural curiosities and antiquities every where, and conversed with learned men of all nations. He published a history of Ethiopia, and other curious books.

LUDOLF (Henry William), nephew of Job above-mentioned, was born at Erfurt in 1655. He came over to England as secretary to M. Lenthe, envoy from the court of Copenhagen to that of London; and being recommended to prince George of Denmark, was received as his secretary. He enjoyed this office for some years, until he was incapacitated by a violent disorder; when he was discharged with a handsome pension: after he recovered, he travelled into Muscovy, where he was well received by the czar, and where his knowledge made the Muscovite priests suppose him to be a conjuror. On his return to London in 1694, he was cut for the stone; and as soon as his health would permit, in acknowledgement of the civilities he had received in Muscovy, he wrote a grammar of their language, that the natives might learn their own tongue in a regular method. He then travelled into the East, to inform himself of the state of the Christian church in the Levant; the deplorable condition of which induced him,

after his return, with the aid of the bishop of Worcester, to print an edition of the New Testament in the vulgar Greek, to present to the Greek church. In 1709, when such numbers of Palatines came over to England, Mr Ludolph was appointed by queen Anne one of the commissioners to manage the charities raised for them; and he died early the following year. His collected works were published in 1712.

LUES, among physicians, is in general use for a disease of any kind; but in a more particular sense is restrained to contagious and pestilential diseases: thus the *lues Gallica* or *venerea*, signifies the venereal disease. See (the *Index* to) MEDICINE.

LUFF, the order from the pilot to the steersman to put the helm towards the lee-side of the ship, in order to make the ship sail nearer the direction of the wind. Hence, luff round, or luff a-lee, is the excess of this movement, by which it is intended to throw the ship's head up in the wind, in order to tack her, &c. A ship is accordingly said to spring her luff, when she yields to the effort of the helm, by sailing nearer to the line of the wind than she had done before. See also HAULING the Wind.

LUFF-Tackle, a name given by sailors to any large tackle that is not defined for a particular place, but may be variously employed as occasion requires. It is generally somewhat larger than the jigger tackle, although smaller than those which serve to hoist the heavier materials into and out of the vessel: which latter are the main and fore-tackles, the stay and quarter-tackles, &c.

LUG-SAIL, a square sail, hoisted occasionally on the mast of a boat, or small vessel, upon a yard which hangs nearly at right angles with the mast. These are more particularly used in the *barca longas*, navigated by the Spaniards in the Mediterranean.

LUGDUNUM, (anc. *geog.*), the capital of the Segusiani in Gallia Celtica, situated at the conflux of the Arar and Rhodanus, on an eminence, as the Celtic term *dune* signifies; built by Manutius Plancus under Augustus, while commanding in that part of Gaul; and whither he led a colony. Now *Lyons*, capital of the Lyonois.

LUGDUNUM *Batavorum*, (anc. *geog.*), a town of the Batavi in Gallia Belgica. Now *Leiden* in Holland.

LUGDUNUM *Convenarum*, (anc. *geog.*) a town of Gaul in Aquitain, at the foot of the Pyrenees. Now *S. Bertrand*, in Gascony.

LUGEUS LACUS, (anc. *geog.*) a lake of Japydia, the westmost district of Illyricum, to the south of the Save, and near the head of the Arsa. Now commonly called the *Zirichnitz Lake*, from a small adjoining town: it is locked on every side with mountains; from which scanty currents run down; the less in quantity their waters, because drunk up by the earth; till at length they are swallowed up in rocky furrows so formed, as to resemble artificial. In these the water being so redundant, as to refuse receiving any more, they regurgitate, and return the water with extraordinary celerity; which thus spreading itself, forms a lake, in most places 18 cubits high: and these waters afterwards retire with no less celerity than they came on, not only through the furrows, but pass through the whole of the bottom,

Lues  
||  
Lugens.



St Luke  
||  
Lully.

as through a sieve; which when perceived by the inhabitants, they directly stop up the larger apertures, and thus take large quantities of fish: when the lake is dry, they cut down their harvest on the spot where they sowed, and sow again before the inundation comes on: and grafts shoots to quick on it, that it may be cut down in three weeks time, (Lazius, Weruherus.)

LUKE (St.), the evangelist, and the disciple of the apostles, was originally of Antioch in Syria, and by profession a physician. He particularly attached himself to St Paul, and was his faithful companion in his travels and labours. He went with him to Troas in Macedonia, about the year 51. He wrote his Gospel in Achaia about the year 53; and, ten years after, the Acts of the Apostles, which contains a history of 30 years. Of all the inspired writers of the New Testament, his works are written in the most elegant Greek. It is believed that St Luke died at Rome, or in Achaia.

*Gospel of St Luke*, a canonical book of the New Testament. Some think that it was properly St Paul's Gospel; and that, when the apostle speaks of *his* Gospel, he means what is called *St Luke's*. Irenæus says, that St Luke digested into writing what St Paul preached to the Gentiles; and Gregory Nazianzen tells us, that St Luke wrote with the assistance of St Paul.

*St Luke wrote with the assistance of St Paul.*

*St Luke wrote with the assistance of St Paul.*

LULA, a town of Swedish Lapland; seated at the mouth of the river Lula, on the west side of the gulph of Bothnia, 42 miles south-west of Tornea. E. Long. 21. o. N. Lat. 64. 30.

LULA *Lapmark*, a province of Swedish Lapland; bounded by that of Tornea on the north, by the Bothnic Gulph on the east, by Pithia Lapmark on the south, and Norway on the west.

LULLI (John Baptist), the most celebrated and most excellent musician that has appeared in France since the revival of learning, was born at Florence. He was taken to France when very young by a person of quality; and he carried the art of playing on the violin to the highest perfection. Lewis XIV. made him superintendent of music. Some time after, Perinna having introduced operas into France, and quarrelling with his company, he resigned his privilege to Lulli. Operas were then carried to the utmost perfection by this celebrated musician, and were attended with continual applause. Lulli every year, after this time, gave a piece of his own composition, till his death, which happened in 1687.

LULLY (Raymond), a famous writer, surnamed the *Enlightened Doctor*, was born in the island of Majorca in 1225. He applied himself with indefatigable labour to the study of the Arabian philosophy, to chemistry, physic, and divinity; and acquired great reputation by his works. He at length went to preach the gospel in Africa; and was stoned to death in Mauritania, at the age of 80. He is honoured as a martyr at Majorca, whither his body was carried. He wrote many treatises on all the sciences, in which he shews much study and subtilty, but little judgment or solidity. A complete edition of his works has been printed at Mentz.—He ought not to be confounded with Raymond Lully of Terraca, surnamed *Neophyta*, who, from being a Jew, turned Dominican friar. This last

Lully maintained several opinions that were condemned by pope Gregory XI.

LUMBAGO, a fixed pain in the small of the back. See the *Index* subjoined to) MEDICINE.

LUMBARIS, a name given to the arteries and veins which spread over the loins.

LUMBRICAL, a name given to four muscles of the fingers, and to as many of the toes.

LUMBRICUS, the EARTH-WORM, in zoology, a genus of insects belonging to the order of vermes intestina. The body is cylindrical, annulated, with an elevated belt near the middle. There is but one species of this animal. It lives under ground, and feeds upon the roots and seeds of plants. It comes above ground in the night, or during rain, for the purpose of copulation. For the effects of these animals in the human body, and the method of expelling them, see (the *Index* subjoined to) MEDICINE.

LUMELLO, a village in Italy, which gives name to the Lumellin, a small district in the duchy of Milan, lying along the river Po, and of which Murtaria and Valencia are the principal places. It was ceded to the duke of Savoy in 1707, and confirmed by the treaty of Utrecht in 1713. E. Long. 8. 42. N. Lat. 45. 5.

LUMINOUSNESS of the Sea. See LIGHT and SEA.

LUMINOUSNESS of Putrescent Substances. See LIGHT.

LUMP-FISH. See CYCLOPTERUS.

LUNA, in astronomy, the moon. See ASTRONOMY, *passim*.

LUNA Cornea. See CHEMISTRY, n° 239, 366.

LUNACY, the madness of a person who formerly hath had the use of his reason, but hath lost it by disease, grief, or some other accident. See MEDICINE.

LUNACY, in law. See IDIOCY and LUNATIC.

LUNATIC, a person affected with lunacy. The word is indeed properly applied to one that hath lucid intervals; sometimes enjoying his senses, and sometimes not; and that frequently supposed to depend on the influence of the moon.

LUNATIC, in law. Under the general term of *non compos mentis*, (which Sir Edward Coke says is the most legal name) are comprized not only lunatics, but perous under frenzies, or who lose their intellects by disease; those that grow deaf, dumb, and blind, not being born so; or such, in short, as are judged by the court of chancery incapable of conducting their own affairs. To these also, as well as idiots, the king is guardian, but to a very different purpose. For the law always imagines, that these accidental misfortunes may be removed; and therefore only constitutes the crown a trustee for the unfortunate persons, to protect their property, and to account to them for all profits received, if they recover, or after their decease to their representatives. And therefore it is declared by the statute 17 Edw. II. c. 10. that the king shall provide for the custody and sustentation of lunatics, and preserve their lands, and the profits of them, for their use when they come to their right mind; and the king shall take nothing to his own use: and if the parties die in such estate, the residue shall be distributed for their souls by the advice of the ordinary, and of course (by the subsequent amendments of the law of admini-

Lumbago  
||  
Lunatic.

nistrations) shall now go to their executors or administrators.

On the first attack of lunacy, or other occasional infamy, when there may be hopes of a speedy reformation of reason, it is usual to confine the unhappy objects in private custody under the direction of their nearest friends and relations: and the legislature, to prevent all abuses incident to such private custody, hath thought proper to interpose its authority, by 14 Geo. III. c. 49. for regulating private mad-houses. But, when the disorder is grown permanent, and the circumstances of the party will bear such additional expence, it is thought proper to apply to the royal authority to warrant a lasting confinement.

The method of proving a person *non compos* is very similar to that of proving him an idiot. The lord chancellor, to whom, by special authority from the king, the custody of idiots and lunatics is intrusted, upon petition or information, grants a commission in nature of the writ *de idiota inquirendo*, to inquire into the party's state of mind; and if he be found *non compos*, he usually commits the care of his person, with a suitable allowance for his maintenance, to some friend, who is then called his committee. However, to prevent sinister practices, the next heir is seldom permitted to be of this committee of the person; because it is his interest that the party should die. But, it hath been said, there lies not the same objection against his next of kin, provided he be not his heir; for it is his interest to preserve the lunatic's life, in order to increase the personal estate by savings, which he or his family may hereafter be entitled to enjoy. The heir is generally made the manager or committee of the estate, it being clearly his interest by good management to keep it in condition; accountable, however, to the court of chancery, and to the *non compos* himself, if he recovers; or otherwise, to his administrators. See IDIOT.

LUNDEN, a considerable town of Sweden, in Gothland; and capital of the territory of Schonen, with an archbishop's see, and an university. It was ceded to the Swedes by the Danes in 1658. E. Long. 13. 25. N. Lat. 55. 40.

LUNENBURG, or LUNEBURG Zell, a principality of Germany, bounded to the south by that of Calenberg, the diocese of Hildesheim, and the duchy of Brunswic; to the north, by the duchy of Lauenburg and the Elbe, by the last of which it is separated from the territory of the imperial city of Hamburg; to the east, by the duchy of Brunswic, the Alte Mark, and the duchy of Mecklenburg; and to the west, by the duchies of Bremen and Verden, the county of Hoya, and the principality of Calenberg. The soil, except along the Elbe, Aller, and Jetz, is either sand, heath, or moors. In the more fruitful parts of it are produced wheat, rye, barley, oats, peas, buck wheat, flax, hemp, hops, pulse, oak, beech, firs, pines, birch, and alder, together with black cattle and horses. The heaths abound with bees and honey, and a small kind of sheep whose wool is long and coarse. Lunenburg is well furnished with salt springs and limestone, and the forest of Gorde with venison. The rivers Elbe, Ilmenau, and Aller, are navigable; and consequently very advantageous to the country, independent of the

fish which they yield. The general diets of this principality are convened by the sovereign twice a year, and held at Zell. They consist of the deputies of the nobility and the towns of Luneburg, Uelzen, and Zell, who have the nomination of the members of the high colleges, and other officers, jointly with the sovereign. There are near 200 Lutheran churches in the country, under two general and 15 subordinate superintendants, several grammar-schools, two Calvinist churches at Zell, and an academy of exercises at Luneburg. The manufactures are chiefly linen cloth, cottons, ribbons, stockings, hats, starch, bleached wax, refined sugar, gold and silver wires, all kinds of wooden wares, barges, boats, and ships. The exports of these to Hamburg, Lubeck, and Altena, are considerable. The neighbourhood of these cities, with the facility of conveying goods and merchandize to them and other places, either by land or water, is very advantageous to this country, and contributes greatly to its subsistence. On account of this principality, the king of Great Britain has a seat and voice both in the college of the princes of the empire, and of the circle of Lower-Saxony. Its quota in the Matricula is 20 horse and 120 foot, or 720 florins in lieu of them. The revenues of the principality arise chiefly from the demesnes, tolls on the Elbe, contributions, duties on cattle, beer, wine, brandy, and other commodities, which all together must be very considerable, some bailiwicks alone yielding upwards of 20,000 rix-dollars.

LUNEBURG, the capital of the principality of the same name, is a pretty large town of Germany, on the river Elmen, or the Ilmenau, which is navigable from the town to the Elbe, at the distance of 13 miles. It is 27 miles from Hamburg, 43 from Zell, 65 from Brunswic, 76 from Bremen, 68 from Hanover; and stands in E. Long. 10. 40. N. Lat. 53. 28. Its inhabitants are reckoned at between 8000 and 9000. Formerly this town was one of the Hanse, and an imperial city. Some derive its name from *Lina*, the ancient name of the Ilmenau; others from *Luna*, the moon, an image of which is said to have been worshipped by the inhabitants in the times of Paganism. Here were anciently several convents, viz. one of Minims, another of Premonstratensians, another of Benedictines, and a fourth of Minorites. Out of the revenues of the Benedictine monastery was founded an academy for the martial exercises, where young gentlemen of the principality of Luneburg are maintained gratis, and taught French, fencing, riding, and dancing; but foreigners are educated at a certain fixed price. A Latin school was also founded, consisting of four classes, and well-endowed out of these revenues. The superintendency and management of these, and the estates appropriated to their maintenance, belongs to the landchaft director, and the anfreiter, who are both chosen from among the Luneburg nobility. The first came in place of the Popish abbot, and as such is head of the states of the principality, and president of the provincial college. He has the title of *excellency*; and in public instruments styles himself, *by the grace of God landtschaft director, and lord of the mansion of St Michael in Luneburg*. The chief public edifices are three parish-churches, the ducal palace, three hospitals, the town-house,

houfe, the falt-magazine, the anatomical theatre, the academy; the conventual church of St Michael, in which lie interred the ancient dukes; and in which is the famous table eight foot long, and four wide, plated over with chafed gold, with a rim embellifhed with precious ftones, of an immenfe value, which was taken from the Saracens by the emperor Otho, and prefented to this church; but in 1698, a gang of thieves ftripped it of 200 rubies and emeralds, together with a large diamond, and moft of the gold, fo that at prefent but a fmall part of it remains. Here are fome very rich falt-fprings. Formerly, when there was a greater demand for the falt, upwards of 120,000 tons have been annually boiled here, and fold off: but fince the commencement of the prefent century, the falt-trade hath declined greatly. A fifth of the falt made here belongs to the king, but is farmed out. It is faid to excel all the other falt made in Germany. This town is well fortified; and has a garrifon, which is lodged in barracks. In the neighbourhood is a good lime-ftone quarry; and along the Ilmenau are ware-houfes, in which are lodged goods brought from all parts of Germany, to be forwarded by the Elmenau to Hamburg, or by the Afche to Lubec, from whence other goods are brought back the fame way. The town itfelf drives a confiderable traffic in wax, honey, wool, flax, linen, falt, lime, and beer.

**LUNGS.** See **ANATOMY**, n° 381.

**LUNG-Wort**, in botany. See **PULMONARIA**.

**LUNGS of Infefts.** In the fly-clafs, the fligmata are extremely numerous; and the trachea which they terminate are branched and divaricated all over the body in an amazing manner, as if every part and particle of the bodies of thefe little creatures had occafion for its particular air-velfels: beftdes thefe, however, flies are provided with proper lungs. They have two; and thofe fo very large, that they frequently take up half, and fometimes two thirds, of the body of the animal.—Thefe are two bladders placed fide-ways, one by the other, alike in fhape and fize; and having their origin at the junction of the corcelet and body, and, in many flies whole bodies are compofed of five rings, extending to the third, and fometimes to the fourth. The fize and figure of each of thefe bladders is fuch as is neceffary to fill almoft entirely that cavity of the body in which it is lodged. They each of them touch the fides of this cavity; the part where they join one another is flat, and this commiffure forms a line running ftraight down the body; they are, however, in this part, though fo clofely in contact, yet not at all joined to one another. This commiffure, however, does not reach quite up to the back, or quite down to the belly: there is a fmall cavity left between each, which was very neceffary in both places; the one to give paffage to the great artery, the other to the excrements.

**LUNISOLAR YEAR**, in chronology, the fpace of 532 common years; found by multiplying the cycle of the fun by that of the moon.

**LUNULA**, in geometry, a plane figure like a crefcent or half-moon.

**LUPERCALIA**, feafts instituted in ancient Rome, in honour of the god Pan.—The word comes from *Lupercal*, the name of a place under the Palatine mountain, where the facrifices were performed.

The Lupercalia were celebrated on the 15th of the Vol. VI.

kalends of March, that is, on the 15th of February, or, as Ovid obferves, on the third day after the ides. They are fuppofed to have been eftablifhed by Evander.

On the morning of this feaft, the luperci, or priefts of Pan, ran naked thro' the ftreets of Rome, ftriking the married women they met on the hands and belly, with a thong, or ftrap of goat's leather, which was held an omen promiffing them fecundity and happy deliveries. See **LUPERICI**.

This feaft was abolifhed in the time of Auguftus; but afterwards reftored, and continued to the time of the emperor Anaftafius.—Baronius fays, it was abolifhed by the pope in 496.

**LUPERICI**, a name given to the priefts of the god Pan. See **LUPERCALIA**.

The *luperci* were the moft ancient order of priefts in Rome; they were divided into two colleges, or companies, the one called *Fabii*, and the other *Quintilii*. To thefe Cæfar added a third, which he called *Julii*.

**LUPINUS**, **LUPINE**; a genus of the diadelphia order, belonging to the decandria clafs of plants. There are feven fpecies, fix of them hardy herbaceous flowery annuals, and one perennial; rifing with upright ftalks from one to three or four feet high; ornamented with digitate or fingered leaves, and terminated by long whorled fpike of papilionaceous flowers, white, blue, yellow, and rofe-coloured. They are all eafily raifed from feed; and fucceed in any open borders, where they make a fine variety.

**LUPULUS**, in botany. See **HUMULUS**.

**LUPUS**, in zoology. See **CANIS**.

**LUPUS-Marinus**. See **ANARRHICHAS**.

**LUPUS**, in aftronomy. See there, n° 206.

**LURCHER**, a kind of hunting-dog much like a mongrel gre-hound, with pricked ears, a fhagged coat, and generally of a yellowifh white colour: they are very fwift runners, fo that if they get between the burrows and the cones, they feldom mifs; and this is their common practice in hunting: yet they ufe other fubtilties, as the tumbler does, fome of them bringing in their game, and thofe are the beft. It is alfo obfervable, that a lurcher will run down a hare at fretch.

**LURE**, in falconry, a device of leather, in the fhape of two wings, ftruck with feathers, and baited with a piece of flefh, to call back a hawk when at confiderable diftance.

**LURIDÆ**, the name of the 28th order in Linneus's fragments of a natural method, confifting of plants whole pale and ominous appearance feems to indicate fomething baleful and noxious in their nature and quality. This order contains the following genera, viz. atropa, browallia, capicum, catefba, celafia, celstrum, datura, digitalis, ellifia, hyofcyamus, lycium, nicotiana, padalum, phyalis, fefamum, folanum, ftrychnus, and verbacum.

**LUSATIA**, a marquisate of Germany, in Upper Saxony; bounded to the eaft by Silefia, to the weft by Mifnia, to the fouth by Bohemia; and to the north by the marquisate by Brandenburg. Till towards the middle of the 17th century, the Upper Lufatia was called the *Mark*, i. e. the *marquisfit* or the *land of Budifin and Gorfitz*; and the Lower only *Lufatia*, which,



which, it is said, in the Slavonic, signifies a woody or marshy country. The air of the Upper Lufatia, which is hilly or mountainous, is better than that of the Lower, a great part of which is moorish and boggy. Both abound in wood, especially the Lower, and turf for fuel. The heathy and mountainous tracts are generally barren; but the lower champagne and marsh lands, are tolerably fertile, producing pasture, wheat, rye, oats, barley, buck-wheat, peas, lentils, beans, and millet; together with flax, hops, tobacco, some white and red wine, and what is called *mannä*. Of several of these articles, however, considerable quantities are imported. In this country are found also quarries of stone, medicinal springs, baftard diamonds, agates, and jaspers, earthen and clays for tobacco-pipes and all sorts of earthen ware, alum, good iron, stone, vitriolic and copper water; nor is it destitute of cattle, fish, and venison. The rivers Spree, the Schwarze or Black Elster, and the Pulznitz, have their sources in the Lufatias, which are also watered by the Neiffe and Queis. The ancient inhabitants of this country were the Saxons, who were succeeded by the Vandals, and these by the Sorber Wends, a Slavonian people. The present inhabitants, the descendants of the Wends, have an odd dress; and the language is so inarticulate and guttural, that it hath been said, it might be pronounced without lips, teeth, or tongue: but the towns are almost wholly peopled by Germans.

In the Upper Lufatia are six towns which appear at the land-diets, 16 smaller country-towns, and four market towns. In the Lower are four diet-towns, 13 country towns, and two market ones. Both marquifates were formerly subject either to the kings of Bohemia, the archdukes of Austria, or electors of Brandenburg; but, in 1636, both were absolutely ceded to the elector of Saxony, in lieu of the 72 tons of gold, which he expended in assisting the emperor Ferdinand II. against the Bohemians.

Christianity was first planted in Lufatia in the seventh century; but it was several centuries after that, before Popery was fully established. In the 11th century many cloisters were erected in the country; but at the reformation such numbers embraced Lutheranism, that it became the predominant religion, and still continues, though there are still several Roman Catholic foundations, churches, market towns, and villages. The enthusiastic sect of HERNHUTERS possesses a great influence and esteem here. There are considerable manufactures of woollen and linen stuffs in the Lufatias, especially the Upper. At Budissen, and in the adjacent country, prodigious quantities of stockings, spatterdashies, caps, and gloves, are made. The linen manufactures also flourish here, chiefly in the Upper-Lufatia, where all sorts of linen are made, printed, and dyed. Exclusive of these, there are considerable manufactures of hats, leather, paper, gunpowder, iron, glass, bleached wax, &c. Though the demand and exportation of these commodities, particularly linens and woollens, is not so great as formerly, yet it is still considerable, and more than over-balances their importations in wool, yarn, silk, wines, spices, corn, fresh and baked fruits, garden-stuff, and hops. Disputes of many years standing have subsisted between the country-artificers and linen-manufacturers on the

one side, and the diet-towns on the other; the latter unjustly seeking to exclude the former from any share in the linen-trade. The natives of this country are said to have quick natural parts, but to be fordidly penurious. We are told they observe the Saxon laws much better than they did the Bohemian. Learning hath been much esteemed and encouraged in both marquifates since the reformation. The schools in the six diet-towns of Upper-Lufatia, particularly at Gorlitz, Budissen, and Zittau, greatly distinguish themselves, having handsome stipends. In Lower Lufatia also are some good schools, with stipends for the maintenance of students. Printing is said to be much followed, and brought to great perfection in this country.

In Upper-Lufatia, the states consist, 1st, of those called *state-lords*; 2dly, of the prelates; 3dly, of the gentry and commonalty, under which are comprehended the counts, barons, nobles, and burgesses, possessors of fees and fief-estates; and, 4thly, of the representatives of the six principal towns. Without the consent of these states no taxes can be imposed, nor any thing of importance, that regards the public, transacted. The diets are ordinary or extraordinary. The ordinary meet once in three years, and the extraordinary when summoned by the sovereign upon particular emergencies. As to ecclesiastical matters, the dean of Budissen and his consistory exercise all manner of episcopal jurisdiction; and, among the Protestants, the jurisdiction belongs either to the superior, the upper-office, or the patrons. The revenues arising to the superior or sovereign, from Upper-Lufatia, consist partly of the subsidies granted by the states, among which, at present, are reckoned capitation and estate-money; and partly of the beer-tax, excise, tolls, &c. — Upper Lufatia is divided into two great circles, viz. those of Budissen and Gorlitz, which are again divided into Lesser circles.

The land-states of Lower Lufatia consist, like those of the Upper, of prelates, lords, and knights, and the representatives of the state towns, which are Luekau, Gubben-Lubben, and Kalau. Two land-diets are yearly held at Lubben, called *voluntary-diets*; but when the superior causes the states to be summoned together at his discretion, and propositions to be laid before them, by commissaries deputed for that purpose, such convention is called a *great land-diet*. The marquifate is divided into five circles, each of which holds a circle-assembly in its circle-town. The chief officers appointed either by the superior or the states, are, the president of the upper-office, the land captain, and the land judge. The principal tribunals are, the land-court, and the upper-office, to which lie appeals from the inferior judicatories. There are also officers for the several circles. Spiritual matters belong here to a consistory, erected in 1668. The ordinary taxes are paid in the chest of the circle; and from thence consigned to the general chest, of which the upper-tax-receiver is superintendent. By him an annual account of the receipts is made out, which is examined and passed by the deputies of the states.

LUSITANIA, (anc. geog.) one of the divisions of Spain, extending to the north of the Tagus, quite to the sea of Cantabria, at least to the Promontorium Celticum. But Augustus, by a new regulation, made the Anas its boundary to the south, the Durus to the

**Lustration**, the north; and thus constituting only a part of the modern Portugal. *Lustiani* the people, (Diodorus, Stephanus).

**Lustrum**, or manner of giving that glofs.

**LUSTRATION**, in antiquity, sacrifices or ceremonies by which the ancients purified their cities, fields, armies, or people, defiled by any crime or impurity. Some of these lustrations were public, others private. There were three species or manners of performing lustration, viz. by fire and sulphur, by water, and by air; which last was done by fanning and agitating the air round the thing to be purified. Some of these lustrations were necessary, *i. e.* could not be dispensed with; as lustrations of houses in time of a plague, or upon the death of any person: others again were done out of choice, and at pleasure. The public lustrations at Rome were celebrated every fifth year; in which they led a victim thrice round the place to be purified, and in the mean time burnt a great quantity of perfumes. Their country lustrations, which they called *ambarvalia*, were celebrated before they began to reap their corn: in those of the armies, which they called *armilustria*, some chosen soldiers crowned with laurel, led the victims, which were a cow, a sheep, and a bull, thrice round the army ranged in battle-array in the field of Mars, to which deity the victims were afterwards sacrificed, after pouring out many imprecations upon the enemies of the Romans. The lustrations of their flocks were performed in this manner: the shepherd sprinkled them with pure water, and thrice surrounded his sheepfold with a composition of fawn, laurel, and brimstone set on fire; and afterwards sacrificed to the goddesses Pales an offering of milk boiled, wine, a cake, and millet. As for private houses, they were lustrated with water, a fumigation of laurel, juniper, olive-tree, fawn, and such like; and the victim commonly was a pig. Lustrations made for particular persons were commonly called *expiations*, and the victims *piacula*. There were also a kind of lustration used for infants, by which they were purified, girls the third, and boys the ninth day after their birth; which ceremony was performed with pure water and spittle. See the article *AMBARVALIA*. In their lustratory sacrifices, the Athenians sacrificed two men, one for the men of their city, and the other for the women. Divers of these expiations were austere: some fasted; others obtained from all sensual pleasures; and some, as the priests of Cybele, castrated themselves. The postures of the penitents were different, according to the different sacrifices. The priests changed their habits according to the ceremony to be performed; white, purple, and black, were the most usual colours. They cast into the river, or at least out of the city, the animals or other things that had served for a lustration or sacrifice of atonement; and thought themselves threatened with some great misfortune when by chance they trod upon them. Part of these ceremonies were abolished by the emperor Constantine, and his successors: the rest subsisted till the Gothic kings were masters of Rome; under whom they expired, excepting what the popes thought proper to adopt and bring into the church.

For the lustration, or rather expiation, of the ancient Jews, see *EXPIATION*.

**LUSTRE**, the glofs or brightness appearing on any thing, particularly on manufactures of silk, wool,

or stuff. It is likewise used to denote the composition or manner of giving that glofs.

The lustre of silks is given them by washing in soap, then clear water, and dipping them in alum-water cold. To give stuffs a beautiful lustre: For every 8 pounds of stuff allow a quarter of a pound of linseed; boil it half an hour, and then strain it through a cloth, and let it stand till it is turned almost to a jelly: afterwards put an ounce and a half of gum to dissolve 24 hours; then mix the liquor, and put the cloth into this mixture; take it out, dry it in the shade, and press it. If once doing is not sufficient, repeat the operation.

Carriers give a lustre to black leather first with juice of barberries, then with gum-arabic, ale, vinegar, and Flanders-glue, boiled together. For coloured leather, they use the white of an egg beaten in water. Morroccos have their lustre from juice of barberries, and lemon or orange. For hats, the lustre is frequently given with common water; sometimes a little black dye is added: the same lustre serves for furs, except that for very black furs they sometimes prepare a lustre of galls, copperas, Roman alum, ox's marrow, and other ingredients.

**LUSTRUM**, in Roman antiquity, a general muster and review of all the citizens and their goods, which was performed by the censors every fifth year, who afterwards made a solemn lustration. See the article *LUSTRATION*.

This custom was first instituted by Servius Tullius, about 180 years after the foundation of Rome. In course of time the lustra were not celebrated so often, for we find the fifth lustrum celebrated at Rome only in the 574th year of that city.

**LUTE**, or **LUTING**, among chemists, a mixed, tenacious, ductile substance, which grows solid by drying, and, being applied to the juncture of vessels, stops them up so as to prevent the air from getting either in or out. See *CHEMISTRY*, n° 78—81.

**LUTE**, is also a musical instrument with strings.—The lute consists of four parts, viz. the table, the body or belly, which has nine or ten sides; the neck, which has nine or ten stops or divisions, marked with strings; and the head, or cross, where the screw for raising and lowering the strings to a proper pitch of tone are fixed. In the middle of the table there is a rose or passage for the sound; there is also a bridge that the strings are fastened to, and a piece of ivory between the head and the neck to which the other extremities of the strings are fitted. In playing, the strings are struck with the right hand, and with the left the stops are pressed. The lutes of Bologna are esteemed the best on account of the wood, which is said to have an uncommon disposition for producing a sweet sound.

**LUTHER** (Martin), the celebrated author of the Reformation, was a native of Eisleben in Saxony, and born in 1483. Tho' his parents were poor, he received a learned education; during the progress of which, he gave many indications of uncommon vigour and acuteness of genius. As his mind was naturally susceptible of serious impressions, and tinged with somewhat of that religious melancholy which delights in the solitude and devotion of a monastic life, he retired into a convent of Augustinian friars; where he acquired great reputation, not only for piety, but for love of knowledge, and unwearied application to study. The

Luther.

cause of this retirement is said to have been, that he was once struck by lightning, and his companion killed by his side by the same flash. He had been taught the scholastic philosophy which was in vogue in those days, and made considerable progress in it: but happening to find a copy of the Bible which lay neglected in the library of his monastery, he applied himself to the study of it with such eagerness and assiduity, as quite astonished the monks; and increased his reputation for sanctity so much, that he was chosen professor first of philosophy, and afterwards of theology, at Wittenberg on the Elbe, where Frederic elector of Saxony had founded an university.

While Luther continued to enjoy the highest reputation for sanctity and learning, Tetzel, a Dominican friar, came to Wittenberg in order to publish indulgences. Luther beheld his success with great concern; and having first inveighed against indulgences from the pulpit, he afterwards published 95 theses, containing his sentiments on that subject. These he proposed, not as points fully established, but as subjects of inquiry and disputation. He appointed a day on which the learned were invited to impugn them either in person or by writing; and to the whole he subjoined solemn protestations of his high respect for the apostolic see, and of his implicit submission to its authority. No opponent appeared at the time prefixed; the theses spread over Germany with astonishing rapidity, and were read with the greatest eagerness.

Though Luther met with no opposition for some little time after he began to publish his new doctrines, it was not long before many zealous champions arose to defend those opinions with which the wealth and power of the clergy were so strictly connected. Their cause, however, was by no means promoted by these endeavours; the people began to call in question even the authority of the canon law, and of the pope himself.—The court of Rome at first despised these new doctrines and disputes; but at last the attention of the pope being raised by the great success of the reformer, and the complaints of his adversaries, Luther was summoned, in the month of July 1518, to appear at Rome, within 60 days, before the auditor of the chamber. One of Luther's adversaries, named Prierias, who had written against him, was appointed to examine his doctrines, and to decide concerning them. The pope wrote at the same time to the elector of Saxony, beseeching him not to protect a man whose heretical and profane tenets were so shocking to pious ears; and enjoined the provincial of the Augustinians to check by his authority the rashness of an arrogant monk, which brought disgrace upon their order, and gave offence and disturbance to the whole church.

From these letters, and the appointment of his open enemy Pereira to be his judge, Luther easily saw what sentence he might expect at Rome; and therefore discovered the utmost solicitude to have his cause tried in Germany, and before a less suspected tribunal. He wrote a submissive letter to the pope, in which he promised an unreserved obedience to his will, for as yet he entertained no doubt of the divine original of the pope's authority; and by the intercession of the other professors, Cajetan the pope's legate in

Luther.

Germany was appointed to hear and determine the cause. Luther appeared before him without hesitation: but Cajetan thought it below his dignity to dispute the point with a person so much his inferior in rank; and therefore required him, by virtue of the apostolic powers with which he was clothed, to retract the errors which he had uttered with regard to indulgences and the nature of faith, and to abstain for the future from the publication of new and dangerous opinions; and at the last forbade him to appear in his presence, unless he proposed to comply with what had been required of him.

This haughty and violent manner of proceeding, together with some other circumstances, gave Luther's friends such strong reasons to suspect that even the imperial safe-conduct would not be able to protect him from the legate's power and resentment, that they prevailed on him secretly to withdraw from Augsburg, where he had attended the legate, and to return to his own country. But before his departure, according to a form of which there had been some examples, he prepared a solemn appeal from the pope, ill-informed at that time concerning his cause, to the pope, when he should receive more full intimation with respect to it.—Cajetan, enraged at Luther's abrupt retreat, and at the publication of his appeal, wrote to the elector of Saxony, complaining of both; and requiring him, as he regarded the peace of the church, or the authority of its head, either to send that seditious monk a prisoner to Rome, or to banish him out of his territories. Frederic had hitherto, from political motives, protected Luther, as thinking he might be of use in checking the enormous power of the see of Rome; and though all Germany resounded with his fame, the elector had never yet admitted him into his presence. But upon this demand made by the cardinal, it became necessary to throw off somewhat of his former reserve. He had been at great expence and bestowed much attention on founding a new university, an object of considerable importance to every German prince; and foreseeing how fatal a blow the removal of Luther would be to its reputation, he not only declined complying with either of the pope's requests, but openly discovered great concern for Luther's safety.

The situation of our reformer, in the mean time, became daily more and more alarming. He knew very well what were the motives which induced the elector to afford him protection, and that he could by no means depend on a continuance of his friendship. If he should be obliged to quit Saxony, he had no other asylum, and must stand exposed to whatever punishment the rage or bigotry of his enemies could inflict; and so ready were his adversaries to condemn him, that he had been declared a heretic at Rome before the expiration of the 60 days allowed him in the citation for making his appearance. Notwithstanding all this, however, he discovered no symptoms of timidity or remissness; but continued to vindicate his own conduct and opinions, and to inveigh against those of his adversaries with more vehemence than ever. Being convinced, therefore, that the pope would soon proceed to the most violent measures against him, he appealed to a general council, which he affirmed to be the representative of the Catholic church,

and



Luther. and superior in power to the pope, who, being a fallible man, might err, as St Peter, the most perfect of his predecessors, had done.

The court of Rome were equally assiduous in the mean time to crush the author of these new doctrines which gave them so much uneasiness. A bull was issued by the pope, of a date prior to Luther's appeal, in which he magnified the virtues of indulgences, and subjected to the heaviest ecclesiastical censures all who presumed to teach a contrary doctrine. Such a clear decision of the sovereign pontiff against him might have been very fatal to Luther's cause, had not the death of the emperor Maximilian, which happened on January 17th 1519, contributed to give matters a different turn. Both the principles and interest of Maximilian had prompted him to support the authority of the see of Rome; but, in consequence of his death, the vicariate of that part of Germany which is governed by the Saxon laws devolved to the elector of Saxony; and, under the shelter of his friendly administration, Luther himself enjoyed tranquillity, and his opinions took such root in different places, that they could never afterwards be eradicated. At the same time, as the election of an emperor was a point more interesting to the pope (Leo X.) than a theological controversy which he did not understand, and of which he could not foresee the consequences, he was so extremely solicitous not to irritate a prince of such considerable influence in the electoral college as Frederick, that he discovered a great unwillingness to pronounce the sentence of excommunication against Luther, which his adversaries continually demanded with the most clamorous importunity.

From the reason just now given, and Leo's natural aversion to severe measures, a suspension of proceedings against Luther took place for 18 months, though perpetual negotiations were carried on during this interval in order to bring the matter to an amicable issue. The manner in which these were conducted having given our reformer many opportunities of observing the corruption of the court of Rome, its obstinacy in adhering to established errors, and its indifference about truth, however clearly proposed or strongly proved, he began, in 1520, to utter some doubts with regard to the divine original of the papal authority which he publicly disputed with Ecceus, one of his most learned and formidable antagonists. The dispute was indecisive, both parties claiming the victory; but it must have been very mortifying to the partizans of the Romish church to hear such an essential point of their doctrine publicly attacked.

The Papal authority being once suspected, Luther proceeded to push on his inquiries and attacks from one doctrine to another, till at last he began to shake the firmest foundations on which the wealth and power of the church were established. Leo then began to perceive that there were no hopes of reclaiming such an incorrigible heretic; and therefore prepared to denounce the sentence of excommunication against him. The college of cardinals was often assembled, in order to prepare the sentence with due deliberation; and the ablest canonists were consulted how it might be expressed with unexceptionable formality. At last it was issued on the 15th of June 1520. Forty-one propositions, extracted out of Luther's works, were therein

condemned as heretical, scandalous, and offensive to pious ears; all persons were forbidden to read his writings, upon pain of excommunication; such as had any of them in their custody were commanded to commit them to the flames; he himself, if he did not, within 60 days, publicly recant his errors, and burn his books, was pronounced an obstinate heretic, excommunicated, and delivered to Satan for the destruction of the flesh; and all secular princes were required, under pain of incurring the same censure, to seize his person, that he might be punished as his crimes deserved.

Luther was not in the least disconcerted by this sentence, which he had for some time expected. He renewed his appeal to the general council; declared the pope to be that antichrist, or man of sin, whose appearance is foretold in the New Testament; declaimed against his tyranny with greater vehemence than ever; and at last, by way of retaliation, having assembled all the professors and students in the university of Wittemberg, with great pomp, and in the presence of a vast multitude of spectators, he cast the volumes of the canon law, together with the bull of excommunication, into the flames. The manner in which this action was justified, gave still more offence than the action itself. Having collected from the canon law some of the most extravagant propositions with regard to the plenitude and omnipotence of the pope's power, as well as the subordination of all secular jurisdiction to his authority, he published these with a commentary, pointing out the impety of such tenets, and their evident tendency to subvert all civil government.

On the accession of Charles V. to the empire, Luther found himself in a very dangerous situation. Charles, in order to secure the pope's friendship, had determined to treat him with great severity. His eagerness to gain this point, rendered him not averse to gratify the papal legates in Germany, who insisted, that, without any delay or formal deliberation, the diet then sitting at Worms ought to condemn a man whom the pope had already excommunicated as an incorrigible heretic. Such an abrupt manner of proceeding, however, being deemed unprecedented and unjust by the members of the diet, they made a point of Luther's appearing in person, and declaring whether he adhered or not to those opinions which had drawn upon him the censures of the church. Not only the emperor, but all the princes through whose territories he had to pass, granted him a safe conduct; and Charles wrote to him at the same time, requiring his immediate attendance on the diet, and renewing his promises of protection from any injury or violence. Luther did not hesitate one moment about yielding obedience; and set out for Worms, attended by the herald who had brought the emperor's letter and safe-conduct. While on his journey, many of his friends, whom the fate of Huss, under similar circumstances, and notwithstanding the same security of an imperial safe-conduct, filled with solicitude, advised and intreated him not to rush wantonly into the midst of danger. But Luther, superior to such terrors, silenced them with this reply, "I am lawfully called (said he) to appear in that city; and thither will I go in the name of the Lord, though as many devils as there are tiles on the houses were there combined against me."

The reception which he met with at Worms, was  
such

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such as might have been reckoned a full reward of all his labours, if vanity and the love of applause had been the principles by which he was influenced. Greater crowds assembled to behold him, than had appeared at the emperor's public entry; his apartments were daily filled with princes and personages of the highest rank; and he was treated with an homage more sincere, as well as more flattering, than any which pre-eminence in birth or condition can command. At his appearance before the diet, he behaved with great decency, and with equal firmness. He readily acknowledged an excess of acrimony and vehemence in his controversial writings; but refused to retract his opinions unless he were convinced of their falsehood, or to consent to their being tried by any other rule than the word of God. When neither threats nor intreaties could prevail on him to depart from this resolution, some of the ecclesiastics proposed to imitate the example of the council of Constance, and, by punishing the author of this pestilent heresy, who was now in their power, to deliver the church at once from such an evil. But the members of the diet refusing to expose the German integrity to fresh reproach by a second violation of public faith, and Charles being no less unwilling to bring a stain upon the beginning of his administration by such an ignominious action, Luther was permitted to depart in safety. A few days after he left the city, a severe edict was published in the emperor's name, and by authority of the diet, depriving him, as an obdurate and excommunicated criminal, of all the privileges which he enjoyed as a subject of the empire, forbidding any prince to harbour or protect him, and requiring all to seize his person as soon as the term specified in his protection should be expired.

But this rigorous decree had no considerable effect; the execution of it being prevented partly by the multiplicity of occupations which the commotions in Spain, together with the wars in Italy and the Low Countries, created to the emperor; and partly by a prudent precaution employed by the elector of Saxony, Luther's faithful patron. As Luther, on his return from Worms, was passing near Altenstein in Thuringia, a number of horsemen in masks rushed suddenly out of a wood, where the elector had appointed them to lie in wait for him, and, surrounding his company, carried him, after dismissing all his attendants, to Wartburg, a strong castle not far distant. There the elector ordered him to be supplied with every thing necessary or agreeable; but the place of his retreat was carefully concealed, until the fury of the present storm against him began to abate, upon a change in the political system of Europe. In this solitude, where he remained nine months, and which he frequently called his *Palmar*, after the name of that island to which the apostle John was banished, he exerted his usual vigour and industry in defence of his doctrines, or in confutation of his adversaries, publishing several treatises, which revived the spirit of his followers, astonished to a great degree and disheartened at the sudden disappearance of their leader.

Luther, weary at length of his retirement, appeared publicly again at Wittenberg, upon the 6th of March 1522. He appeared indeed without the elector's leave; but immediately wrote him a letter, to prevent his ta-

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king it ill. The edict of Charles V. as severe as it was, had given little or no check to Luther's doctrine: for the emperor was no sooner gone into Flanders, than his edict was neglected and despised, and the doctrine seemed to spread even faster than before. Carolostadius, in Luther's absence, had pushed things on faster than his leader; and had attempted to abolish the use of mass, to remove images out of the churches, to set aside auricular confession, invocation of saints, the abstaining from meats; had allowed the monks to leave their monasteries, to neglect their vows, and to marry; in short, had quite changed the doctrine and discipline of the church at Wittenberg: all which, though not against Luther's sentiments, was yet blamed by him, as being rashly and unseasonably done. Lutheranism was still confined to Germany: it was not got to France; and Henry VIII. of England made the most rigorous acts to hinder it from invading his realm. Nay, he did something more: to shew his zeal for religion and the holy see, and perhaps his skill in theological learning, he wrote a treatise *Of the seven sacraments*, against Luther's book *Of the captivity of Babylon*; which he presented to Leo X. in October 1521. The pope received it very favourably; and was so well pleased with the king of England, that he complimented him with the title of *Defender of the faith*. Luther, however, paid no regard to his kingship; but answered him with great sharpness, treating both his person and performance in the most contemptuous manner. Henry complained of Luther's rude usage of him to the princes of Saxony; and Fisher, bishop of Rochester, replied to his answer, in behalf of Henry's treatise: but neither the king's complaint, nor the bishop's reply, was attended with any visible effects.

Luther, though he had put a stop to the violent proceedings of Carolostadius, now made open war with the pope and bishops; and, that he might make the people despise their authority as much as much as possible, he wrote one book against the pope's bull, and another against the order falsely called the *order of bishops*. The same year 1522, he wrote a letter, dated July the 29th, to the assembly of the states of Bohemia; in which he assured them that he was labouring to establish their doctrine in Germany, and exhorted them not to return to the communion of the church of Rome: and he published also this year, a translation of the New Testament in the German tongue, which was afterwards corrected by himself and Melancthon. This translation having been printed several times, and being in every body's hands, Ferdinand archduke of Austria, the emperor's brother, made a very severe edict, to hinder the further publication of it; and forbade all the subjects of his imperial majesty to have any copies of it, or of Luther's other books. Some other princes followed his example; and Luther was so angry at it, that he wrote a treatise *Of the secular power*, in which he accuses them of tyranny and impiety. The diet of the empire was held at Nuremberg, at the end of the year; to which Hadrian VI. sent his brief, dated November the 25th: for Leo X. died upon the 2d of December 1521, and Hadrian had been elected pope upon the 9th of January following. In this brief, among other things, he observes to the diet, how he had heard, with grief, that Martin Luther, after the sentence of Leo X. which was ordered to be executed by the edict

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of Worms, continued to teach the same errors, and daily to publish books full of heresies: that it appeared strange to him, that so large and so religious a nation could be seduced by a wretched apostate friar: that nothing, however, could be more pernicious to Christendom: and that therefore he exhorts them to use their utmost endeavours to make Luther, and the authors of these tumults, return to their duty; or, if they refuse and continue obstinate, to proceed against them according to the laws of the empire, and the severity of the last edict.

The resolution of this diet was published in the form of an edict, upon the 6th of March 1523; but it had no effect in checking the Lutherans, who still went on in the same triumphant manner. This year Luther wrote a great many pieces: among the rest, one upon the dignity and office of the supreme magistrate; which Frederic elector of Saxony is said to have been highly pleased with. He sent, about the same time, a writing in the German language to the Waldenses, or Pickards, in Bohemia and Moravia, who had applied to him "about worshipping the body of Christ in the eucharist." He wrote also another book, which he dedicated to the senate and people of Prague, "about the institution of ministers of the church." He drew up a form of saying mass. He wrote a piece, entitled, *An example of popish doctrine and divinity*; which Dupins calls a *satire against nuns and those who profess a monastic life*. He wrote also against the vows of virginity, in his preface to his commentary on 1 Cor. viii. And his exhortations here were, it seems, followed with effects: for soon after, nine nuns, among whom was Catharine de Bore, eloped from the nunnery at Nimptschen, and were brought, by the assistance of Leonard Coppen, a burgess of Torgan, to Wittenberg. Whatever offence this proceeding might give to the Papists, it was highly extolled by Luther; who, in a book written in the German language, compares the deliverance of these nuns from the slavery of a monastic life, to that of the souls which Jesus Christ has delivered by his death. This year Luther had occasion to canonize two of his followers, who, as Melchior Adam relates, were burnt at Brussels in the beginning of July, and were the first who suffered martyrdom for his doctrine. He wrote also a consolatory epistle to three noble ladies at Missnia, who were banished from the duke of Saxony's court at Friburg, for reading his books.

In the beginning of the year 1524, Clement VII. sent a legate into Germany to the diet, which was to be held at Nuremberg. Hadrian VI. died in October 1523, and was succeeded by Clement upon the 19th of November. A little before his death he canonized Benno, who was bishop of Meissen in the time of Gregory VII. and one of the most zealous defenders of the holy see. Luther, imagining that this was done directly to oppose him, drew up a piece with this title, *Against the new idol and old devil set up at Meissen*; in which he treats the memory of Gregory with great freedom, and does not spare even Hadrian. Clement VII.'s legate represented to the diet of Nuremberg, the necessity of enforcing the execution of the edict of Worms, which had been strangely neglected by the princes of the empire: but, notwithstanding the legate's solicitations, which were very pressing, the

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decrees of that diet were thought for ineffectual, that they were condemned at Rome, and rejected by the emperor. It was in this year that the dispute between Luther and Erasmus, about free-will, began. Erasmus had been much courted by the Papists to write against Luther; but he was all along of opinion, that writing would not be found an effectual way to end the differences and establish the peace of the church. However, tired out at length with the importunities of the pope and the Catholic princes, and desirous at the same time to clear himself from the suspicion of favouring a cause which he would not seem to favour, he resolved to write against Luther, though, as he tells Melancthon, it was with some reluctance, and chose free-will for the subject. His book was intitled *A diatribe, or conference about free-will*; and was written with much moderation, and without personal reflections. He tells Luther in the preface, "That he ought not to take his dissenting from him in opinion ill, because he had allowed himself the liberty of differing from the judgment of popes, councils, universities, and doctors of the church. Luther was some time before he answered Erasmus's book; but at last published a treatise *De servo arbitrio, or Of the servitude of man's will*; and though Melancthon had promised Erasmus, that Luther should answer him with civility and moderation, yet Luther had so little regard to Melancthon's promise, that he never wrote any thing sharper. He accused Erasmus of being careless about religion, and little solicitous what became of it, provided the world continued in peace; and that his notions were rather philosophical than Christian. Erasmus immediately replied to Luther, in a piece called *Hyperaspistes*; in the first part of which he answers his arguments, and in the second his personal reflections.

In October 1524, Luther flung off the monastic habit; which, though not premeditated and designed, was yet a very proper preparative to a step he took the year after; we mean, his marriage with Catharine de Bore. Catharine de Bore was a gentleman's daughter, who had been a nun, and was taken, as we have observed, out of the nunnery of Nimptschen, in the year 1523. Luther had a design, as Melchior Adam relates, to marry her to Glacius, a minister of Ortamunden: but he did not like Glacius; and so Luther married her himself, upon the 13th of June 1525. This conduct of his was blamed not only by the Catholics, but, as Melancthon says, by those of his own party. He was even for some time ashamed of it himself; and owns, that his marriage had made him so despicable, that he hoped his humiliation would rejoice the angels, and vex the devils. Melancthon found him so afflicted with what he had done, that he wrote some letters of consolation to him. It was not so much the marriage, as the circumstances of the time, and the censures passed upon Luther. He married all of a sudden, and at a when Germany was groaning under the miseries of a war, which was said at least to be owing to Lutheranism. Then, again, it was thought an indecent thing in a man of 42 years of age, who was then, as he pretended, restoring the Gospel and reforming mankind, to involve himself in marriage with a woman of 26, either through incontinence, or any account whatever. But Luther, as soon as he had recovered



Luther. covered himself a little from this abashment, assumed his former air of intrepidity, and boldly supported what he had done with reasons. "I took a wife, (says he), in obedience to my father's commands; and hastened the consummation, in order to prevent impediments, and stop the tongues of slanderers." It appears from his own confession, that this reformer was very fond of Mrs de Bore, and used to call her his *Catharine*; which made profane people think and say wicked things of him: "And therefore," says he, "I am married of a sudden, not only that I might not be obliged to hear the clamours which I knew would be raised against me, but to stop the mouths of those who reproached me with *Catharine de Bore*." Luther also gives us to understand, that he did it partly as concurring with his grand scheme of opposing the Catholics.

Luther, notwithstanding, was not himself altogether satisfied with these reasons. He did not think the step he had taken could be sufficiently justified upon the principles of human prudence; and therefore we find him, in other places, endeavouring to account for it from a supernatural impulse. But whether there was any thing divine in it or not, Luther found himself extremely happy in his new state, and especially after his wife had brought him a son. "My rib Kate (says he in the joy of his heart) desires her compliments to you, and thanks you for the favour of your kind letter. She is very well, through God's mercy. She is obedient and complying with me in all things; and more agreeable, I thank God, than I could have expected; so that I would not change my poverty for the wealth of Croesus." He was heard to say, (Seckendorf tells us), that he would not exchange his wife for the kingdom of France, nor for the riches of the Venetians; and that for three reasons: first, Because she had been given him by God, at the time when he implored the assistance of the Holy Ghost in finding a good wife; secondly, Because, though she was not without faults, yet she had fewer than other women: and, thirdly, Because she religiously observed the conjugal fidelity she owed him. There went at first a report, that *Catharine de Bore* was brought to bed soon after her marriage with Luther; but Erasmus, who had wrote that news to his friends, acknowledged the falsity of it a little after.

His marriage, however, did not retard his activity and diligence in the work of reformation. He revised the Augsburg confession of faith, and apology for the Protestants, when the Protestant religion was first established on a firm basis. See PROTESTANTS and REFORMATION.

After this, Luther had little else to do than to sit down and contemplate the mighty work he had finished; for that a single monk should be able to give the church so rude a shock, that there needed but such another entirely to overthrow it, may very well seem a mighty work. He did indeed little else: for the remainder of his life was spent in exhorting princes, states, and universities, to confirm the reformation which had been brought about thro' him; and publishing from time to time such writings as might encourage, direct, and aid them in doing it. The emperor threatened temporal punishment with armies, and the pope eternal with bulls and anathe-

mas; but Luther cared for none of their threats. His friend and coadjutor Melancthon was not so indifferent; for Melancthon had a great deal of softness, moderation, and diffidence in his make, which made him very uneasy, and even sorrowful, in the present disorders. Hence we find many of Luther's letters written on purpose to support and comfort him under these several distresses and anxieties.

In the year 1533, Luther wrote a consolatory epistle to the citizens of Oirschatz, who had suffered some hardships for adhering to the Augsburg confession of faith; in which, among other things, he says: "The devil is the host, and the world is his inn; so that wherever you come, you shall be sure to find this ugly host." He had also about this time a terrible controversy with George duke of Saxony, who had such an aversion to Luther's doctrine, that he obliged his subjects to take an oath that they would never embrace it. However, 60 or 70 citizens of Leipzig were found to have deviated a little from the Catholic way in some point or other, and they were known previously to have consulted Luther about it; upon which George complained to the elector John, that Luther had not only abused his person, but also preached up rebellion among his subjects. The elector ordered Luther to be acquainted with this; and to be told at the same time, that if he did not clear himself of the charge, he could not possibly escape punishment. But Luther easily refuted the accusation, by proving, that he had been so far from stirring up his subjects against him, on the score of religion, that, on the contrary, he had exhorted them rather to undergo the greatest hardships, and even suffer themselves to be banished.

In the year 1534, the Bible translated by him into German was first printed, as the old privilege, dated at Bibliopolis, under the elector's hand, shows; and it was published the year after. He also published this year a book against masses and the consecration of priests, in which he relates a conference he had with the devil upon those points; for it is remarkable in Luther's whole history, that he never had any conflicts of any kind within, but the devil was always his antagonist. In February 1537, an assembly was held at Smalkald about matters of religion, to which Luther and Melancthon were called. At this meeting Luther was seized with so grievous an illness, that there were no hopes of his recovery. He was afflicted with the stone, and had a stoppage of urine for 11 days. In this terrible condition he would needs undertake to travel, notwithstanding all that his friends could say or do to prevent him; his resolution, however, was attended with a good effect; for the night after his departure, he began to be better. As he was carried along, he made his will, in which he bequeathed his detestation of Popery to his friends and brethren; agreeably to what he often used to say: *Pestis eram vivus, moriens ero mors tua, papa*; that is, "I was the plague of Popery in my life, and shall continue to be so in my death."

This year the Pope and the court of Rome, finding it impossible to deal with the protestants by force, began to have recourse to stratagem. They affected therefore to think, that though Luther had indeed carried things on with a high hand and to a violent extreme,

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yet what he had pleaded in defence of these measures was not entirely without foundation. They talked with a seeming show of moderation; and Pius III. who succeeded Clement VII. proposed a reformation first among themselves, and even went so far as to fix a place for a council to meet at for that purpose. But Luther treated this farce as it deserved to be treated; unmasked and detected it immediately; and, to ridicule it the more strongly, caused a picture to be drawn, in which was represented the pope seated on high upon a throne, some cardinals about him with foxes tails on, and seeming to evacuate upwards and downwards, (*sursum deorsum repurgare*, as Melchior Adam expresses it.) This was fixed over-against the title-page, to let the readers see at once the scope and design of the book; which was, to expose that cunning and artifice with which those subtle politicians affected to cleanse and purify themselves from their errors and superflitions. Luther published about the same time a confutation of the pretended Grant of Constantine to Sylvester bishop of Rome; and also some letters of John Hufs, written from his prison at Constance, to the Bohemians.

In this manner was Luther employed till his death, which happened in the year 1546. That year, accompanied by Melancthon, he paid a visit to his own country, which he had not seen for many years, and returned again in safety. But soon after, he was called thither again by the earls of Mansfeldt, to compose some differences which had arisen about their boundaries. Luther had not been used to such matters; but because he was born at Ilsben, a town in the territory of Mansfeldt, he was willing to do his country what service he could, even in this way. Preaching his last sermon therefore at Wittemberg, upon the 17th of January, he set off on the 23d; and at Hall in Saxony lodged with Justus Jonas, with whom he stayed three days, because the waters were out. Upon the 28th, he passed over the river with his three sons and Dr Jonas; and being in some danger, he said to the Doctor, "Do not you think it would rejoice the devil exceedingly, if I and you, and my three sons, should be drowned?" When he entered the territories of the earls of Mansfeldt, he was received by 100 horsemen, or more, and conducted in a very honourable manner; but was at the same time so very ill, that it was feared he would die. He said, that these fits of sickness often came upon him, when he had any great business to undertake: of this, however, he did not recover; but died upon the 18th of February, in the 63d year of his age. A little before he expired, he admonished those that were about him to pray to God for the propagation of the Gospel; "because, (said he), the council of Trent, which had sat once or twice, and the pope, would devise strange things against it." Soon after, his body was put into a leaden coffin, and carried with funeral pomp to the church at Ilsben, when Dr Jonas preached a sermon upon the occasion. The earls of Mansfeldt desired that his body should be interred in their territories; but the elector of Saxony insisted upon his being brought back to Wittemberg: which was accordingly done; and there he was buried with the greatest pomp that perhaps ever happened to any private man. Princes, earls, nobles, and students without number, attended the procession; and Melancthon made his funeral oration.

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A thousand lies were invented by the Papists about Luther's death. Some said that he died suddenly; others, that he killed himself; others, that the devil strangled him; others, that his corpse stunk so abominably, that they were forced to leave it in the way, as it was carried to be interred. Nay, lies were invented about his death, even while he was yet alive. Luther, however, to give the most effectual refutation of this account of his death, put forth an advertisement of his being alive; and, to be even with the Papists for the malice they had shown in this lie, wrote a book at the same time to prove, that "the papacy was founded by the devil."

Luther's works were collected after his death, and printed at Wittemberg in 7 vols folio. Catharine de Bore survived her husband a few years; and continued the first year of her widowhood at Wittemberg, tho' Luther had advised her to seek another place of residence. She went from thence in the year 1547, when the town was surrendered to the emperor Charles V. Before her departure, she had received a present of 50 crowns from Christian III. king of Denmark; and the elector of Saxony, and the counts of Mansfeldt, gave her good tokens of their liberality. With these additions, to what Luther had left her, she had wherewithal to maintain herself and her family handsomely. She returned to Wittemberg, when the town was restored to the elector; where she lived in a very devout and pious manner, till the plague obliged her to leave it again in the year 1552. She sold what she had at Wittemberg; and retired to Torgau, with a resolution to end her life there. An unfortunate mischance befel her in her journey thither, which proved fatal to her. The horses growing unruly, and attempting to run away, she leaped out of the vehicle she was conveyed in; and, by leaping, got a fall, of which she died about a quarter of a year after, at Torgau, upon the 20th of December 1552. She was buried there in the great church, where her tomb and epitaph are still to be seen; and the university of Wittemberg, which was then at Torgau because the plague raged at Wittemberg, made a public programme concerning the funeral pomp.

LUTHERANISM, the sentiments of Martin Luther with regard to religion.

Lutheranism has undergone some alterations since the time of its founder.—Luther rejected the epistle of St James, as inconsistent with the doctrine of St Paul, in relation to justification; he also set aside the apocalypse: both which are now received as canonical, in the Lutheran church.

Luther reduced the number of sacraments to two, viz. baptism, and the eucharist: but he believed the impanation, or consubstantiation, that is, that the matter of the bread and wine, remain with the body and blood of Christ; and it is in this article that the main difference between the Lutheran and English churches consists.

Luther maintained the mass to be no sacrifice; exploded the adoration of the host, auricular confession, meritorious works, indulgences, purgatory, the worship of images, &c. which had been introduced in the corrupt times of the Romish church. He also opposed the doctrine of free will, maintained predestination, and ascribed our justification to be solely by the

imputation of the merits and satisfaction of Christ. He also opposed the fallings in the Romish church, monastical vows, the celibate of the clergy, &c.

**LUTHERANS**, the Christians who follow the opinions of Martin Luther, one of the principal reformers of the church in the 16th century. See **LUTHER**.

**LUTHERN**, in architecture, a kind of window over the cornice, in the roof of a building; standing perpendicularly over the naked of a wall, and serving to illuminate the upper story.

Lutherns are of various forms, as square, semicircular, round, called *bull's eye*, *flat arches*, &c.

**LUTRA**, in zoology. See **MUSTELA**.

**LUTTI** (Beneditto), an eminent painter, born at Florence in 1666. He was the disciple of Antonio Dominico Gabiani, and his merit was judged equal to that of his master: he painted few beside easel-pieces; and his works were much valued and sought for in England, France, and Germany. The emperor knighted him; and the elector of Mentz, together with his patent of knighthood, sent him a cross set with diamonds. Lutti was never satisfied in finishing his pictures; yet tho' he often retouched them, they never appeared laboured. He died in 1724.

**LUTZEN**, a town of Upper Saxony, in Germany; famous for a battle fought here in 1632, when Gustavus Adolphus king of Sweden was killed. It is situated on the river Elster, in E. Long. 12. 37. N. Lat. 51. 20.

**LUXATION**, is when any bone is moved out of its place or articulation, so as to impede or destroy its proper office or motion. See **SURGERY**.

**LUXEMBURG**, a city of the Austrian Netherlands, and capital of a duchy of the same name. It is seated partly on a hill, and partly on a plain; but is very strong, both by art and nature. It is but indifferently built, though there are some good stone houses in it. There is nothing very remarkable among the structures but the Jesuits church; which is a handsome edifice, after the modern taste. It was taken by Lewis XIV. in 1684; who so augmented the fortifications, that it is now one of the strongest towns in Europe. It was ceded to Spain by the treaty of Ryfwick; but the French took it again in 1701, and gave it up to the house of Austria by the treaty of Utrecht. It is 25 miles south-west of Treves, and 100 west of Mentz. E. Long. 6. 10. N. Lat. 49. 52.

**LUXEMBURG**, the duchy of, is one of the 17 provinces of the Netherlands. It is bounded on the east by the archbishoprick of Treves; on the south, by Lorrain; on the west, partly by Champagne, and partly by the bishoprick of Liege, which likewise, with part of Limburg, bound it on the north. It lies in the forest of Ardenne, which is one of the most famous in Europe. In some places it is covered with mountains and woods, and in general it is fertile in corn and wine; and here are a great number of iron-mines. The principal rivers are, the Moselle, the Sour, the Ourte, and the Semoy. It belongs partly to the house of Austria, and partly to the French; and Thionville is the capital of the French part.

**LUXEMBURG** (François Henry de Montmorency) duke of, and marshal of France, a renowned general in the service of Lewis XIV. was born in 1628. He was with the prince of Conde at the battle of Ro-

croy, in 1643; and in 1668 distinguished himself at the conquest of Franche Compté. In 1672, he commanded in chief the French army in Holland; when he defeated the enemy near Woerden and Bodegrave, and was universally admired for the fine retreat he made in 1673. He became marshal of France in 1675; gained the battle of Flerus in 1690, that of Steenkirk in 1692, and that of Nerwind in 1693. He died at Versailles, in 1695.

**LUXURIANS FLOS**, "a luxuriant or double flower;" a flower, some of whose parts are increased in number, to the diminution or entire exclusion of others.

The parts that are augmented or multiplied in luxuriant flowers, are the flower-cup and petals, which Linnæus considers as the teguments or covers of the flower; the parts that are diminished, or entirely excluded, are the stamina or chives, which the same author denominates the male organs of generation.

Luxuriance in flowers is capable of the three following varieties.

1. A flower is said to be **MULTIPLIED**, (*flos multiplicatus*), when the increase of the petals is not such as to exclude all the stamina: in this sense, flowers are properly said to be double, triple, or quadruple, according to the number of multiplications of the petals.

2. A flower is said to be **FULL**, (*flos penus*), when, by the multiplication of the petals, all the stamina are excluded. Such are most of the double flowers that engage the attention of florists.

3. A flower is said to be **PROLIFIC**, (*flos prolifer*), which produces flowers, and sometimes leaves, from its centre.

For a particular description of each of these kinds of luxuriance in flowers, see the articles **MULTIPLICATUS FLOS**, **PLENUS FLOS**, and **PROLIFER FLOS**.

Many natural orders of plants do not in any circumstances produce luxuriant flowers. Of this kind are the masked-flowers of Tournefort, excepting calve's-snout; the rough-leaved, umbelliferous, starry-plants, and such as flower at the joints, of Ray: some umbelliferous flowers, however, are *prolific*.

The pea-bloom or butterfly-shaped flowers are rarely rendered double; some instances, however, of luxuriance, are observed in a species of ladies-finger, coronilla, and broom.

All luxuriant flowers are vegetable monsters. Such as are perfectly full, by which we mean the greatest degree of luxuriance, cannot be propagated by seeds; because these, for want of impregnation, can never ripen. Full flowers, therefore, are very properly denominated by Linnæus, *eunuchs*. This highest degree of luxuriance is very common in carnation, lychnis, anemone, stock, Indian erefs, rose, marsh marigold, ranunculus, violet, peony, and narcissus.

Flowers which do not exclude all the stamina, perfect their seeds. Of this kind are poppy, fennel-flower, campanula, and some others.

Some flowers, as those of the water-lily, fig-marigold, and cactus, have many rows or series of petals, without the number of stamina being in the least diminished. Such flowers are by no means to be reckoned luxuriant, in the slightest degree.

Luxuriance in flowers is generally owing to excess of nourishment.

**LUXURY**;



LUXURY; voluptuousness, or an extravagant indulgence in diet and dress.

Concerning the general utility of luxury to a state, there is much controversy among the political writers. Baron Montesquieu lays it down, that luxury is necessary in monarchies, as in France; but ruinous to democracies, as in Holland. With regard therefore to Britain, whose government is compounded of both species, it may still be a dubious question, how far private luxury is a public evil; and, as such, cognizable by public laws. And indeed our legislators have several times changed their sentiments as to this point: for formerly there were a number of penal laws existing, to restrain excess in apparel; chiefly made in the reigns of Edward III. IV. and Henry VIII. against picked shoes, short doublets, and long coats; all of which were repealed by statute 1 Jac. I. c. 25. But, as to excess in diet, there still remains one ancient statute unrepealed, 10 Edw. III. ft. 3. which ordains, that no man shall be served, at dinner or supper, with more than two courses; except upon some great holidays there specified, in which he may be served with three.

LYBIA, or LIBYA, a name anciently given to all that part of Africa lying between the border of Egypt and the river Triton; and comprehending *Cyrenæica*, *Marmarica*, and the *Regio Syrtica*. See these articles.

LYCÆUM, in Grecian antiquity, an academy situated on the banks of the Ilissus at Athens. It was composed of porticoes and walks, where Aristotle taught philosophy; walking there constantly every day till the hour of anointing, whence he and his followers had the name of *Peripatetics*.

LYCÆUS, (anc. geog.), a mountain of Arcadia, sacred to Jupiter; whence *Jupiter Lycæus*, (Pliny.) Sacred also to Pan, (Virgil): and hence *Lycæa*, the rites performed to Pan on this mountain; which Evander carrying with him to Latium, were called *Lupercalia*, (Virgil).

LYCAONIA, (anc. geog.) a small country of the Hither Asia, contained between Pamphylia to the south, Cappadocia to the north, Pisidia and Phrygia to the west, and Armenia Minor to the east. *Lycæones*, the people. This country, tho' situated very near mount Taurus, and part of it on it, yet the Romans reckoned it to Asia intra Taurum. *Arcadia*, anciently called *Lycæonia*, (Stephanus.) Also an island in the Tiber, joined to Rome by a bridge, and to the land by another, namely, the Cæstius and Fabricius.

LYCHNIS, CAMPION, including also the bachelor's button, catch-fly, &c.; a genus of the pentagynia order, belonging to the decandria class of plants.

*Species*, &c. 1. The Chalcedonica, or Chalcedonian scarlet lychnis, hath a fibrated perennial root; upright, straight, hairy, annual stalks, rising three or four feet high; garnished with long, spear-pointed, close-fitting leaves, by pairs opposite; and the stalk crowned by a large, compact, flat bunch of beautiful scarlet or flame-coloured flowers, appearing in June and July. Of this there are varieties, with single scarlet flowers, with large double scarlet flowers, of exceeding beauty and elegance, with pale-red flowers, and with white flowers. Of these varieties, the dou-

ble scarlet lychnis is superior to all for size and elegance: the flowers being large, very double, and collected into a very large bunch, exhibit a charming appearance; the single scarlet kind is also very pretty; and the others effect an agreeable variety with the scarlet kinds. 2 The dicecia, or dicecious lychnis, commonly called *bachelors-button*, hath fibrated perennial roots; upright stalks, branching very diffuse and irregular, two or three feet high; having oval, acute-pointed, rough leaves, by pairs opposite; and all the branches terminated by clusters of dicecious flowers of different colours and properties in the varieties; flowering in April and May. The varieties, are the common single red-flowered bachelors button, double red, double white, and single white-flowered. The double varieties are exceedingly ornamental in their bloom; the flowers large, very double, and continue long in blow; the single red sort grows wild by ditch sides and other moist places in many parts of England; from which the doubles were accidentally obtained by culture in gardens. The flowers are often dicecious, *i. e.* male and female on distinct plants. 3 The viscaria, or viscous German lychnis, commonly called *catch-fly*, hath fibry perennial roots; crowned by a tuft of long, grassy leaves close to the ground; many erect, straight, single stalks, rising a foot and a half or two feet high, exuding from their upper part a viscous or clammy matter; garnished with long narrow leaves, by pairs opposite; and terminated by many reddish-purple flowers, in clusters one above another, forming a sort of long loose spike; all the flowers with entire petals; flowering in May. Of this also there are varieties, with single red flowers, with double red flowers, and with white flowers. The double variety is considerably the most eligible for general culture, and is propagated in plenty by parting the roots. All the varieties of this species emitting a glutinous liquid matter from their stalks, flies happening to light thereon sometimes stick and entangle themselves, whence the plant obtain the name *Catch-fly*. 4. The flos-cuculi, cuckoo-flower lychnis, commonly called *ragged-robin*, hath fibry perennial roots; upright, branchless, channelled stalks, rising near two feet high; garnished with long, narrow, spear-shaped leaves, in pairs opposite; and terminated by branchy foot-stalks, sustaining many purple, deeply quadrifid flowers; appearing in May. The flowers having each petal deeply quadrid in a torn or ragged-like manner, the plant obtained the cant name of *Ragged-robin*. There are varieties with single flowers and double flowers. The double sort is a large, very multiple, fair flower: it is an improved variety of the single, which grows wild in most of our moist meadows, and is rarely cultivated; but the double, being very ornamental, merits culture in every garden. All the four species and respective varieties are very hardy; all fibrous-rooted, the roots perennial; but are annual in stalks, which rise in spring, flower in summer, succeeded in the singles by plenty of seed in autumn, by which all the single varieties may be raised in abundance, but the doubles only by dividing the roots, and some by cuttings of the flower-stalks.

LYCODYNTES, in natural history, the petrified

Lycopod-  
don.

teeth of the lupinus-pisici, or wolf-fish, frequently found fossil. They are of different shapes; but the most common kind rise into a semiorbicular form, and are hollow within, somewhat resembling an acorn-cup: this hollow is found sometimes empty, and sometimes filled with the stratum in which it is immersed. Many of them have an outer-circle, of a different colour from the rest.

LYCOPERDON, in botany; a genus of the order of fungi, belonging to the cryptogamia class of plants. There are ten species, of which the following are the most remarkable. 1. The tuber, truffles, or subterraneous puff-balls, is a native of woods both in Scotland and England. It is a subterraneous fungus, growing generally in clusters three or four inches under ground, without any visible root. The figure of it is nearly spherical, the size that of a potatoe; the exterior coat at first white, afterwards black, and studded with pyramidal or polyhedrous tubercles; the internal substance solid and callous, of a dirty-white or pale-brown colour, grain'd like a nutmeg with serpentine lines; in which, according to Micheli, are imbedded minute oval capsules, containing each from two to four round warted seeds. The truffles of Great Britain seldom exceed three or four ounces in weight; but in Italy, and some other parts of the continent, they are said to have been found of the enormous size of eight and even 14 pounds. They are received at our tables, either fresh and roasted like potatoes, or dried and sliced into ragouts. They have a volatile and somewhat urinous smell, and are reputed to be aphrodisiacal. Dogs are with much pains taught to hunt for them by the scent, and to scratch up the ground under which they lie.

2. The bovista, or common puff-ball, is frequent in meadows and pastures in the autumn. It varies exceedingly in size, figure, superficies, and colour. In general, it consists of a sack or bag, having a root at its base, and the bag composed of three membranes, an epidermis, a tough white skin, and an interior coat which adheres closely to the central pith. The pith in the young plants is of a yellowish colour, at first firm and solid, but soon changes into a cellular spongy substance, full of a dark dull-green powder, which discharges itself through an aperture at the top of the fungus, which aperture is formed of lacerated segments, in some varieties reflexed. The powder is believed to be the seeds, which through a microscope appear of a spherical form, and to be annexed to elastic hairs. See *Haller's Hist. Helvet. n. 2172*.

Among the numerous varieties of this fungus, the glabrum is most remarkable. It is a smooth sessile kind, of a nearly spherical form, puckered or contracted at the root. This sometimes grows to an enormous size. It has been found in England as big as a man's head; and at Carraria, near Padua in Italy, specimens have been gathered, weighing 25 pounds, and measuring two yards in circumference: but its more ordinary size is that of a walnut or an apple.

The varieties of this species have no limits, being frequently found to run into one another; the scaly, warty, and echinated coats turning smooth as the plants grow old, and the neck of the fungus having no determinate length. The natural colour of the

Lycopod-  
dium.

puff-ball is either white, grey, or ash-coloured: but is sometimes found yellowish, tawny, and brownish. The internal spongy part of it, bound on to wounds, is esteemed good to stop bleedings. Pressed and dried in an oven, the puff-ball becomes a kind of tinder, the smoke of which is said to intoxicate bees. See *Gent. Mag. July 1766*. The Italians fry the great variety, and indeed any of the others when young, and eat them with salt and oil, according to the relation of Marfigli.

LYCOPODIUM, or CLUB-MOSS; a genus of the order of musci, belonging to the cryptogamia class of plants. There are 24 species; of which the following are the most remarkable. 1. The *clavatum*, or common club-moss, is common in dry and mountainous places, and in fir forests. The stalk is prostrate, branched, and creeping, from a foot to two or three yards long; the radicles woody. The leaves are numerous, narrow, lanceolate, acute, often incurved at the extremity, terminated with a long white hair, and every where surround the stalk. The peduncles are erect, firm, and naked (except being thinly set with lanceolate scales); and arise from the ends of the branches. They are generally two or three inches long, and terminated with two cylindrical yellowish spikes, imbricated with oval-acute scales, finely lacerated on the edges, and ending with a hair. In the *ala* or bosom of each scale is a kidney shaped capsule, which bursts with elasticity when ripe, and throws out a light yellow powder, which, blown into the flame of a candle, flashes with a small explosion. The Swedes make mats of this moss to rub their shoes upon. In Russia, and some other countries, the powder of the capsules is used in medicine to heal galls in children, chops in the skin, and other sores. It is also used to powder over official pills, and to make artificial lightning at theatres. The Poles make a decoction of the plant, and, dipping a linen cloth into it, apply it to the heads of persons afflicted with the disease called the *plica polonica*, which is said to be cured by this kind of fomentation.

2. The *selago*, or fir club-moss, is common in the Highland mountains of Scotland, and in the Hebrides. The stalk at the base is single and reclining; but a little higher is divided into upright dichotomous branches, from two to six inches high, surrounded with eight longitudinal oblique series of lanceolate, smooth, rigid, imbricated leaves. Near the summits of the branches, in the *alc* of the leaves, are placed single kidney shaped capsules, consisting of two valves, which open horizontally like the shells of an oyster, and cast out a fine yellow powder. These capsules Linnaeus supposes to be *antheræ*, or male parts of fructification. In the *alc* also of many of the leaves, near the tops of the branches, are often found what the same great author calls *female flowers*, but which the ingenious Haller esteems to be only gems or buds of a future plant. They consist, first, of four stiff, lanceolate, incurved, minute leaves, one of the outermost longer and larger than the rest. These are supposed to correspond to the *calyx* in regular flowers. Again, at the bottom of this *calyx*, are five small pellucid substances resembling leaves, visible only by a microscope, which are supposed analogous to pistils. These, in time, grow up into three large broad leaves,

**Lycophron** two of the five united together like the hoof of an ox; with a third narrower one annexed at the base, and two other minute ones opposite to the other three.

**Lydgate.**

These five leaves are joined at the base; and in autumn, falling from the *calyx*, vegetate, and produce a new plant. See a dissertation *De feminibus muscorum, Amoenit. Academ. II.* p. 261. In the island of Raafay, near Sky, in Ross-shire, and some other places, the inhabitants make use of this plant instead of alum, to fix the colours in dyeing. The Highlanders also sometimes take an infusion of it as an emetic and cathartic: but it operates violently; and, unless taken in a small dose, brings on giddiness and convulsions. Linnæus informs us, that the Swedes use a decoction of it to destroy lice on wine and other animals.

**LYCOPHRON**, a famous Greek poet and grammarian, born at Colchis in Eubœa, flourished about 304 B. C. and, according to Ovid, was killed by an arrow. He wrote 20 tragedies; but all his works are lost, except a poem intitled *Cassandra*, which contains a long train of predictions, which he supposes to have been made by Cassandra, Priam's daughter. This poem is extremely obscure. The best edition of it is that of Dr Potter, printed at Oxford, in 1697, folio.

**LYCURGUS**, the celebrated legislator of the Spartans, was the son of Eunomes king of Sparta. —He travelled to Greece, to the isle of Crete, to Egypt, and even to the Indies, to converse with the sages and learned men of those countries, and to learn their manners, their customs, and their laws. After the death of his brother Polydictes, who was king of Sparta, his widow offered the crown to Lycurgus, promising that he would make herself mistress of the child of which she was pregnant, provided he would marry her; but Lycurgus nobly refused these advantageous offers, and afterwards contented himself with being tutor to his nephew Charillus, and restored to him the government when he came of age: but notwithstanding this regular and generous conduct, he was accused of a design to usurp the crown. This calumny obliged him to retire to the island of Crete, where he applied himself to the study of the laws and customs of nations. At his return to Lacedæmon, he reformed the government: and, to prevent the disorders occasioned by luxury and the love of riches, he prohibited the use of gold and silver; placed all the citizens in a state of equality; and introduced the strictest temperance, the most exact discipline, and those admirable laws, which (a few excepted) have been celebrated by all historians. It is said, that, to engage the Lacedæmonians to observe them inviolably, he made them promise with an oath not to change any part of them till his return; and that he afterwards went to the island of Crete, where he killed himself, after having ordered that his ashes should be thrown into the sea, for fear lest if his body should be carried to Sparta the Lacedæmonians would think themselves absolved from their oath. He flourished about 870 B. C.

**LYDGATE** (John), called the *Monk of Bury*; not, as Cibber conjectures, because he was a native of that place, for he was born about the year 1380, in the village of Lydgate; but because he was a monk of the Benedictine convent at St Edmund's-Bury.

After studying some time in our English universities, he travelled to France and Italy; and, having acquired a competent knowledge of the languages of those countries, he returned to London, where he opened a school, in which he instructed the sons of the nobility in polite literature. At what time he retired to the convent of St Edmund's-Bury, does not appear; but he was certainly there in 1415. He was living in 1446, aged about 66; but in what year he died, is not known. Lydgate, according to Pits, was an elegant poet, a persuasive rhetorician, an expert mathematician, an acute philosopher, and a tolerable divine. He was a voluminous writer; and, considering the age in which he lived, an excellent poet. His language is less obsolete, and his verification much more harmonious, than the language and verification of Chaucer, who wrote about half a century before him. He wrote, 1. History of the Theban war, printed at the end of Chaucer's works, 1561, 1602, 1687. 2. Poemation of good counsel; at the end of Chaucer's works. 3. The life of Hector; London 1594, fol. printed by Gros, dedicated to Henry V. 3. Life of the Blessed Virgin; printed by Caxton. 4. The proverbs of Lydgate upon the fall of princes; printed by Winck. Word. Lond. .... 4to. 5. Dispute of the horse, the sheep, and the goose; printed in Caxton's Collect. 4to. 6. The temple of brass; among the works of Chaucer. 7. London lickpenny; vide Stow's history, &c. &c. Besides an incredible number of other poems and translations preserved in various libraries, and of which the reader will find a catalogue in bishop Tanner.

**LYDIA** (anc. geogr.), the same with *MÆONIA*; though some reckoned this last only a part, by the name of *Lydia Superior*, (Callimachus, Pausanias); inhabited by the people called *Meones*, (Strabo); *Meones*, (Homer, Dionysius Periegetes); the *Lower Lydia*, or that towards the sea-coast, being inhabited by the *Lydi*. Thus the case anciently stood; though not so constantly, but that those towards the Lower Lydia were called *Meones*; and *Lydi*, those towards the Higher. Afterwards, the colony of the Ionians prevailing, and the name *Meones* becoming gradually to cease, the lower part came to be called *Ionia*, the name *Lydia* being appropriated to the higher. This latter had Ionia on the west, Phrygia on the east, Mysia to the north, and Caria to the south. In Cræsus's time, the kingdom of Lydia extended from the Halys on the east, to the Egean sea on the west side. *Lydi*, the people, descendants of Lud, the son of Shem. They were the first who coined gold and silver, (Herodotus); were called *Mali*, from their vicious character, (Athenæus); prostituted their daughters, (Herodotus, Horace); anciently a brave people, all excellent horsemen, (idem); *Lydius*, the epithet. *Lydius mos*, denotes effeminacy.

**LYDYAT** (Thomas), a learned English divine, born in 1572, and educated at Oxford. About the year 1609, he became acquainted with Dr James Usher, afterwards archbishop of Armagh, who carried him to Ireland. He was at Dublin college for about two years, after which he returned to England; and the rectory of Alkington becoming vacant, he was presented to it: but at length, being engaged for the debts of a near relation, which for the present he was unable.

**Lydia,**  
**Lydyat.**



Lydius  
Lymph.

unable to pay, having before spent his patrimony in printing several books, he was sent to prison; and was confined at Oxford, in the King's-bench, and elsewhere, till Sir William Boswell, a generous patron of learned men, Dr Robert Pink, warden of New-college, bishop Usher, and Dr Laud, discharged the debt. In the civil wars, he suffered much in his rectory of Alkington from the parliament-party; was four times pillaged to the value of at least 70l.; and was forced for a quarter of a year together to borrow a shirt to shift himself. He died in 1646. He wrote some pieces in English, and many works in Latin, on chronology and natural history.

**LYDIUS LAPIS**, in the natural history of the ancients; the name of the stone used by way of touch-stone for the trial of gold and silver, and called by some *Heraclius Lapis*; both of which names were also applied by the ancients to the load-stone, and hence has arisen no small misunderstanding of their works. Pliny has observed, that both the load-stone and touch stone were at times called *Lydius* and *Heraclius Lapis*.

The true *lapis Lydius*, or the touch-stone, was anciently found only in the river Tmolus; but was afterwards found in many other places, and is now very common in many of the German rivers. The ancients give us very remarkable and circumstantial accounts of the uses they made of it; and it is plain they were able to discern the alloys of gold by means of it with very great exactness. We at present use several different stones under this name, and for the same purpose. In Italy, a green marble called *verdello*, is most frequently used; and with us, very frequently small pieces of the *basalt*, the same with that vast piece of black marble called the *Giant's Causeway* in Ireland. See **BASALTES**; **GIANT'S Causeway**; **ICELAND**, n° 9; **STAFFA**; and **VOLCANO**.

**LYING-IN-WOMEN**. See **MIDWIFERY**.

**LYING-TO**, or **LYING-BY**, the situation of a ship, when she is retarded in her course, by arranging the sails in such a manner as to counteract each other with nearly an equal effort, and render the ship almost immoveable, with respect to her progressive motion, or head-way. A ship is usually brought-to by the main and fore-top sails, one of which is laid aback, whilst the other is full; so that the latter pushes the ship forward, whilst the former resists this impulse by forcing her astern. This is particularly practised in a general engagement, when the hostile fleets are drawn up in two lines of battle opposite each other. It is also used to wait for some other ship, either approaching or expected; or to avoid pursuing a dangerous course, especially in dark or foggy weather, &c.

**LYME**, a sea-port town of Dorsetshire, in England, seated on the sea-shore, with a good harbour. It is so called from a little river which runs through the middle of the town, and falls into the sea. It is a large well-built corporation town, is a place of good trade, and sends two members to parliament. The duke of Monmouth landed here with a handful of men in 1685, which were soon increased to 6000, and was then proclaimed king; but he was defeated by king James's army, taken prisoner, and beheaded. W. Long. 3. 5. N. Lat. 50. 40.

**LYMPH**, a fine colourless fluid, separated in the

body from the mass of blood, and contained in peculiar vessels called *lymphatics*.

The late ingenious Mr Hewson published a dissertation on the lymph and lymphatic system in the human body, and that of other animals. The lymph he considers both as contained in its proper vessels, and exhaled into the different cavities of the body. In each of these states, the lymph coagulated when exposed to the air, and seemed more to resemble the buffy coat of the blood than its watery parts, to which it hath been compared by authors. This coagulum, Mr Hewson found to vary considerably in its degree of cohesion, being always firm in strong animals, but in weak ones of a much looser texture. And, in the course of his experiments, he observed, that the fluid collected from the different cavities of the body uniformly agreed with that found in the lymphatic vessels of the same animal, both in degree of tenacity, and time of coagulation. Thus far these fluids correspond with the coagulable part of blood; but they differ from it in the time necessary to form the coagulum, the blood always jellifying much sooner than the lymph, and later in strong than in weak animals; the very reverse of what happens to that fluid.

From the following observations, Mr Hewson is of opinion, that the vessels exhaling fluids into the cavities of the body, whatever their structure may be, have a power of changing the nature of their contents.

1. A coagulum is often found covering the internal surface of inflamed cavities, without the smallest erosion. This can only be the natural exhalation, thrown out by inflamed vessels, with a strong disposition to coagulate.

2. As the lymph is discharged, variously changed in tenacity and other properties, by disease; and as pus is sometimes found in the same manner in cavities, without any ulceration; the author thinks it at least probable, that this purulent matter is only the lymph itself, still more altered by flowing through vessels in a higher or different degree of inflammation; and in this notion he is confirmed, by observing, with the microscope, globules in pus like those of the milk, a secreted liquor.

On a review of his experiments, he thinks they evidently point out the following general conclusions: that the lymph and exhalations are of a similar nature, but differ widely from the watery part of the blood; that they coagulate on exposure to air, and are probably a species of the lymph of the blood; that they differ in the time and firmness of coagulation, in various degrees, from the caustic habit, where they scarcely jelly at all, to the inflammatory, where very short time is requisite to a strong cohesion; and that, in some cases, the inflamed vessels can even convert the fluid passing through them into real purulent matter.

Having thus given a correct idea of the properties of the lymph, he goes on to trace it from the circulating mass, and to investigate the manner of its separation; with regard to which, he observes, two different opinions have been entertained. The first and most general is, that the lymph is poured into cavities, either by exhalant arteries, or pores of an organized nature on the sides of vessels. The other has lately been started by Dr Hunter, who considers the lymph as merely a transudation of the thinner parts of the blood through

Lymph.

*Lymph.* through interstices or inorganized pores in the vessels circulating the red-blood; which, tho' they retain the serum, allow the more fluid parts to pass with ease. In support of this new doctrine, Dr Hunter adduces the following facts.

1. Water injected into the blood-vessels of a dead animal readily imitates this transudation.

2. Blood itself transudes after death, the lymph to which it owed its consistence being coagulated.

3. Bile transudes through the gall-bladder; for, on opening an animal, all the adjacent parts are tinged.

With a view to disprove this notion, Mr Hewson maintains, that there is a tension in the vessels of a living body, forsaking them with life; and that, did such an exudation take place, it would defeat one great intention of vessels, the conveyance of fluids, and involve us in a continual round of exhalation and absorption, very contrary to the common simplicity of nature.

A second objection of Mr Hewson is, that, if liquors thus filtrate into cavities, not only must the vessels, creeping on their sides, but the membranes lining these cavities, be porous. But, if these pores are admitted in every part, we cannot deny them to the whole extent of these membranes. And, were this the case, a partial dropsy could never occur; as a fluid would as easily escape, from within, outwards, as it formerly infiltrated itself from the vessels into any cavity.

Another argument against the opinion of Dr Hunter, is drawn by Mr Hewson from his former experiment, where he found the lymph, in different states of the body, so various in degree of viscosity. He is at a loss to conceive, how pores of an inorganized nature should pour out fluids so different in consistence, much less filtrate pus from the blood, where it never existed.

The argument of Dr Hunter, founded on the transudation of blood, proceeds, he thinks, on an erroneous principle; for the blood of a living animal is actually thinned by the presence of the coagulable lymph: and, if this transudation takes place in a dead, and not in a living animal, it ought rather to be attributed to a change in the vessels, than their contents. And this is almost proven by the attentive examination of one of the strongest of the doctor's own facts, viz. the bilious tinge on parts contiguous to the gall-bladder, which only takes place after an animal has been some time dead; but is never found in one recently killed.

From all these, the author concludes, that, as the lymph is very different from water, it cannot be filtrated by inorganic passages; and that the common opinion is founded on reason and experiment, the lymph being not only transmitted thro' exhalant vessels, but by them changed in its properties, and adapted to the office of lubricating parts.

The manner in which the lymph is discharged into the cavities of the body being thus ascertained with a great degree of probability, Mr Hewson proceeds to examine how it is again absorbed, whether by the common veins, or by the lymphatic system. Besides the authority of all the ancients, the advocates for the first opinion think they are possessed of several conclusive arguments in its favour.

They allege, that, in dead bodies, injections easily

flow from the veins into several cavities. This Mr Hewson thinks, for many reasons, to have little force. The veins are very delicate, and may be ruptured by a very small distending power. And this seems in general to have been the case; for most of the injections used in these experiments were far too gross to reach the extremities of the veins. And when those of a more penetrating nature are employed, they imitate that transudation from vascular laxity, which takes place after death.

A second argument adduced in favour of the old opinion is, that chyle has been seen in the mesenteric veins. But this is a very inconclusive one, as the whole serum has been found of a white colour, and, in these vessels, might easily be mistaken for chyle. Another has been furnished by the structure of the penis: but this analogy is now given up; it being generally allowed, that the blood is not absorbed, but forced from its cells into the venous system.

Ligatures and compression on veins have afforded a fourth argument; but two circumstances unite to render this less satisfactory: 1<sup>st</sup>, The lymphatics, being contiguous to the veins, may be affected by the same cause. And, 2<sup>d</sup>, the compression of a vein will throw a greater quantity of fluids on the exhalant arteries, by obstructing their flow through the red ones.

It has been farther alleged, that there is no continuation of vessels nor any lymphatics in the placenta, though absorption evidently takes place. To this Mr Hewson replies, that there may be lymphatics, though not discovered, and continued vessels from the mother to the foetus, though never injected.

The sixth argument is supplied by an experiment of Kaul Boerhaave. He injected a fluid into the intestines, which soon appeared in the mesenteric veins. But Mr Hewson is much inclined to believe that there was some deception in this experiment, as it has been often repeated, without similar success. Did the fact even happen, it could never be by absorption, that ceasing soon after death, while this happened at the end of several hours; and, as pressure was applied to the stomach, the author thinks a venous rupture might give rise to the appearances observed by Kaul Boerhaave.

The seventh and last argument in favour of absorption by the veins was, that many animals were destitute of any other vessels capable of performing that office, as birds, fishes, and amphibia; but the discovery of lymphatics in every one of these, has totally overthrown this argument.

To all these, the ingenious Mr Meckel has, of late, added some others, derived from injections of mercury into the lymphatic glands, vesiculæ feminales, bladder, and lacteal ducts of the breast, which he found to pass readily, and without extravasation, into the adjacent veins. But Mr Hewson observes, that extravasation is detected with difficulty; and as the lymphatic vessels often lie contiguous to veins, it is not impossible that, in some cases, the mercury might burst from the one of them into the other, as often happened to Mr Hewson in the mesentery of the turtle. From all these, the author considers the old opinion as at least open to many and weighty objections.

Unsatisfied, however, with this negative proof, he goes on to show, that absorption in reality is carried on by the lymphatic system, from the analogy of all these

*Lymph.*

these vessels with the lacteals, which form a part of that system, and are without doubt absorbents. Besides this, the course by which poisons reach the circulating fluids when externally applied, evidently points out that they enter the lymphatic vessels alone, and are by them conveyed towards the heart. To these Mr Hewson adds his observation, that the same fluid is always found in these vessels, and the cavities whence they arise. Thus there will remain little doubt of the absorbent power of lymphatics, a function of such importance in the œconomy, that, for it alone, nature has provided a distinct set of vessels: they had indeed, by some, been suspected to be only reflected arterial branches; but this has been long confuted by the experiments of Dr Monro and Dr Hunter.

LYMPHATICS, in anatomy, the vessels in which the lymph is contained, and the glands by which it is separated in the human and other bodies. An account of the structure and offices of the lymphatic glands and vessels has lately been published, from Mr Hewson's experiments, by Mr Falconer of London. He observes, that each lymphatic gland is a congeries of tubes, consisting of arteries, veins, lymphatic vessels, and nerves, connected by the cellular substance. Glands of this kind, he remarks, are nowhere to be found but in the course of the larger lymphatic vessels. These vessels, in their passage from the extreme parts of the body towards the thoracic duct, enter and pass thro' the lymphatic glands in the following manner:

About a quarter of an inch before a lymphatic enters a gland, it divides into two, three, or four smaller branches, sometimes into a greater number. These enter the gland at the part farthest from the thoracic duct; and are then subdivided into branches, as small as the ramifications of the arteries and veins which accompany them to every part of the gland. After being thus minutely divided, they reunite, and gradually become larger as they approach the opposite side of the gland, forming three or four branches, which are joined by other lymphatics that arise from the cells of the gland. All these branches unite together about a quarter of an inch from that part where they came out of the gland, and form a common trunk, larger than that below the gland, by the additional lymphatics it receives from the cells of the gland.

Although, in every lymphatic gland, very small cells can be discovered by the microscope, those appearances in such glands which have commonly been called *cellular*, are by no means of that nature, being only, our author observes, little eminences formed by the bending of one vessel round another. On cutting into a fresh lymphatic gland, it is found to contain a thickish, white, milky fluid; and if this fluid be carefully washed from any part of it, and the gland then examined with the microscope, an infinite number of very small cells are observed, which cannot be discovered by the naked eye.

Mr Falconer adopts the opinion of the late Mr Hewson with respect to the *use* likewise of the lymphatic system. The glands he considers as organs intended for the purpose of secreting a fluid of a particular nature from the blood; and the lymphatic vessels he looks upon as so many excretory ducts. In proof of this assertion, he observes, that, if the arteries and

veins of a lymphatic gland have been previously injected with a coloured fluid, and a part of the gland be then viewed thro' the microscope, these cells, formerly taken notice of, appear extremely vascular. And it is into their cavities that the whole fluid found in the gland is secreted. This fluid is absorbed by the lymphatic vessels which arise from the cells of the glands, and is by them, in common with the other fluids, carried into the course of the circulation. The lymphatic vessels, therefore, which originate from the cells of the gland, are, in the lymphatic glands, analogous to the excretory ducts of other glands. We have the same proofs, our author asserts, that the lymphatic glands secrete this white fluid, and that it is carried from the lymphatic glands by the lymphatic vessels, that we have of glands in other parts of the body separating different fluids and having excretory ducts. For, if we cut into a lymphatic gland, we find a white fluid; and, if a ligature be made on the lymphatic vessel coming from that gland, we find a fluid of the same kind contained in those lymphatic vessels. This, Mr Falconer observes, is as convincing a proof that the lymphatic vessels are excretory ducts to the lymphatic glands; and as satisfactory, as that the hepatic duct is the excretory duct of the liver. We know the liver secretes bile, because we find it in that viscous; and we know the ductus hepaticus is its excretory duct, because we find bile contained in it. The proofs are similar, and therefore equally conclusive.

LYNCEUS, in fabulous history, one of the 50 sons of Ægeus, married Hypermnestra, one of the 50 daughters of Danaus. See HYPERMNESTRA.

LYNCEUS, in fabulous history, one of the Argonauts, who went with Jason in the expedition to obtain the golden fleece. He was of great use to the Argonauts, by enabling them to avoid the sand-banks and rocks they found in their way. The poets say, that Lynceus had so piercing a sight, that it could not only penetrate to the bottom of the sea, but even to hell. Some mythologists suppose, that this fable is taken from Lynceus's skill in observing the stars, and discovering the mines of gold and silver concealed in the earth.

LYNCURIUM, a stone thought to be the same with the tourmalin. The name is derived from *lynx*, and *urine*.

LYNCURIUS LAPIS, a stone capable of producing mushrooms. See AGARICUS.

LYNN REGIS, a town of Norfolk, in England, situated in E. Long. o. 33. N. Lat. 52. 46. It is a handsome, large, well-built corporation-town, and sends two members to parliament; is encompassed with a wall and a deep trench; and there are two small rivers that run through its streets, over which there are about 15 bridges. It is a trading place on account of its commodious harbour; is governed by a mayor, recorder, high-steward, 12 aldermen, and 18 common council-men. Formerly it was well fortified; but it has now only a battery of 10 guns. It has two churches, a very large chapel, and two dissenting meeting-houses. Here are about 2000 houses, mostly pretty good ones, built with brick: the streets are narrow, but well-paved; it has a good market-place, with an elegant cross; and there are here some remains of monasteries.

LYNX, in zoology. See FELIS.

LYON,



LYON *King of Arms. Sec KING; and LAW,*  
N<sup>o</sup> clviii. 16.

This office is of great antiquity and respect in Scotland; but although the precise time of its institution is unknown, yet it must have been as early as the introduction of armorial figures as hereditary marks of gentility and distinction into this country, which was in the 12th century. His regalia are, a crown of gold, with a crimson velvet-cap, a gold taffel, and an ermine lining; a velvet-robe reaching to his feet, with the arms of the kingdom embroidered thereon before and behind in the proper tinctures; a triple row of gold chain round his neck, with an oval gold medal pendant thereto, on one side of which is the royal bearing, and on the other St Andrew with his cross enamelled in proper colours, and a baton of gold enamelled green, powdered with the badges of the kingdom. The Lord Lyon's rank is superior to that of any other king of arms, as he holds his office immediately from the sovereign by commission under the great seal; whereas the kings of arms in England are deputies to the Earl Marshal, and act under his authority. Formerly Scotland was divided into two provinces, the one on the north and the other on the south side of Forth; and these provinces were under the management of two deputies appointed by the Lord Lyon to superintend the execution of all the business of his office. Before the revolution, the Lord Lyon at his admission into office was most solemnly crowned by the sovereign, or his commissioner, in presence of the nobility, the officers of state, and other great men, after a suitable sermon preached in the royal chapel; and his crown was of the same form with the imperial crown of the kingdom. On solemn occasions, he wears the regalia above described; at all other times, he wears the oval gold-medal or badge on his breast suspended by a broad green ribbon. He has the absolute disposal of all the offices in his own court, and of the heralds and pursuivants places. The messengers at arms throughout Scotland are also created by him, and are amenable to his jurisdiction. And the powers vested in him by his commission are the same with those of the sovereign in all matters relative to the marks of gentility.

To give the reader a more complete idea of the dignity and nature of this office, we shall subjoin,

*The order observed at the coronation of Sir Alexander Arskine of Cambo, Baronet, Lord-Lyon King of Arms, at the royal palace of Holyrood-house, on the 27th day of July 1681; his royal highness James duke of Albany and York being his majesty's high commissioner.* 1. The chair of state being placed upon a throne of two steps in height, under the royal canopy, in the chamber of presence; and the imperial crown, sceptre, and sword of state, being placed on a table before the throne, the said table covered with purple velvet fringed with gold; his majesty's high-commissioner was conveyed by the officers of state and the nobility to the throne, when he sat down in the chair of state, the nobility standing on each side.

II. Then Sir Alexander Arskine was introduced in this manner:

1. The king's six trumpets in their coats, two and two, sounding.

2. The six pursuivants at arms in their coats, two and two.

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3. The six heralds in their robes, two and two, the last five bearing the Lord Lyon's regalia thus: the eldest his crown, the second his robe, the third his furcoat, the fourth his collar of gold and medal-pendant, the said collar being composed of three rows, and the fifth his baton.

III. Mr Robert Innes, Lyon-depute, bearing his patent under the great seal.

IV. The master of the ceremonies.

V. The Lord Lyon supported by two baronets, viz. Sir William Sharp of Scotscraig, and Sir John Maitland; and attended with the six macers on either side, with their silver maces.

VI. Then having three several times done their homage to his majesty's high commissioner, viz. at the door, in the middle of the chamber, and before the throne, those who carried the patent and regalia drew near to the chair of state; the rest of the heralds and pursuivants retiring to the windows, and the trumpets to a place allotted for them.

VII. The master of the ceremonies brought the Lord Lyon to his majesty's high commissioner, and he kneeled down before him on a velvet-cushion, and was dubbed knight with the sword of state.

VIII. The master of the ceremonies called for the patent under the great seal, and gave it to one of the clerks of the privy council, who read it aloud. He then delivered it to his royal highness, and from him to the Lord Lyon, shewing him the king's pleasure, his duty, and the importance of the honour conferred upon him by so gracious a master.

IX. His royal highness caused the Lord Lyon to swear the oath of allegiance, and take the declaration, the same being read by one of the clerks of the privy council.

X. The master of the ceremonies took the furcoat of arms, and gave it to his royal highness, who, with his assistance, put it on the Lord Lyon; his highness saying, "I do vest you with this coat and robe of your office during all the days of your lifetime, which you shall wear on all honourable occasions, keeping the same free from all spot of treason, villainy, and disgrace."

XI. The master of the ceremonies took the crown, and delivered the same to his royal highness; who put it on the Lord Lyon's head, saying, "In the name of his most sacred majesty the king, I crown you, Sir Alexander Arskine of Cambo, baronet, Lyon King of Arms throughout all the kingdom of Scotland, and the isles, colonies, and dependencies thereunto belonging, with all the powers, privileges, liberties, honours, and dignities, belonging to that office."

XII. The master of the ceremonies gave the baton to his royal highness; who, delivering it to the Lord Lyon, said, "I deliver to you this baton of your office, in token of that command and regal authority which his majesty gives you over all who bear his majesty's arms under you in this kingdom of Scotland."

XIII. The master of the ceremonies gave the collar to his royal highness; who put it about the Lord Lyon's neck, saying, "This royal token and badge of your master's favour, I give you to be worn by you all the days of your life, in token of your precedence before all others of under degree and quality, in consequence

Lyon  
||  
Lyons.

sequence of your good and faithful services done and to be done."

XIV. Then his royal highness blessed the Lord Lyon, and took his oath in the terms following: "I shall defend the Catholic faith to the uttermost of my power. I shall be leal and true, secret and serviceable, to our sovereign lord the king, and to all estates, *that is to say*, to emperors, kings, princes, archdukes, dukes, marquises, earls, viscounts, lords, or barons, knights, esquires, gentlemen, ladies, widows, and maidens of good fame, and shall forward their lawful business upon their expense: and what ambassage or message I take in hand to do, I shall do the same truly, without adding or taking from. I shall forbear all open vices, common bordells, common hazard, and common drinking in taverns. I shall fortify and defend the privileges of the noble office of arms with all my power; and shall never reveal any man's secrets, treason excepted. I shall observe and keep all the forenamed points: So help me, God; and by my part of paradise."

XV. Then one of the heralds, with sound of trumpet, proclaimed out of one of the windows Sir Alexander Arskine of Cambo, baronet, Lyon King of Arms throughout all the kingdom of Scotland, and the isles and dependencies thereunto belonging, with all the honours and privileges that to this office appertain.

XVI. His royal highness, taking the Lord-Lyon by both hands, raised him; who, taking off his crown, gave his highness his humble thanks, and then cried aloud, "A largess of the most high and mighty monarch Charles, by the grace of God, king of Scotland, England, France, and Ireland, defender of the faith, &c."

XVII. Then by sound of trumpets all the heralds and purfivants proclaimed the same words out of the windows.

XVIII. The Lord-Lyon, in his robes, collar, and crown, with the baton of command in his hand, was attended back to the chamber from whence he came, in the same order as before, the heralds and purfivants proclaiming round the court in their return, "A Largess," &c. *supra*.

LYONNOIS, a large province of France; bounded on the north, by Burgundy; on the east, by Dauphiny, Bresse, and the principality of Dombes; on the south, by Vivarais and Velay; and on the west, by Auvergne and a small part of Bourbonnois. It comprehends Lower Lyonnaise, Beaujolois, and Forez; and it produces corn, wine, fruits, and more especially excellent chefnuts. The principal rivers are the Soane, the Rhone, and the Loire. Lyons is the capital town.

LYONS, a large, rich, handsome, ancient, and famous town of France, being the most considerable in the kingdom, next to Paris, with an archbishop's see, an academy of sciences and belles lettres, and an academy of arts and sciences settled here in 1736. It is seated in the centre of Europe, on the confluence of the rivers Rhone and Soan: on the side of it are two high mountains; and the mountain of St Sebastian serves as a bulwark against the north winds, which often blow here with great violence. It contains about 150,000 inhabitants; and the houses, in general, are high and well built. It has six

gates, and as many suburbs. The town-house, the arsenal, the amphitheatre built by the ancient Romans, the hospital, and the numerous palaces, are worthy of a traveller's attention. The cathedral is a superb structure, and the canons that compose the chapter are all persons of distinction. It is a place of very great trade, which is extended not only through France, but to Italy, Switzerland, and Spain; and there are four celebrated fairs every year, which are frequented by great numbers of people. It derives vast advantages from the rivers it stands upon; and is situated in E. Long. 4. 55. N. Lat. 45. 46.

LYRA, in ichthyology. See CALLYONIMUS.

LYRE, a musical instrument of the stringed kind, much used by the ancients.

Concerning the number of strings with which this instrument was furnished, there is great controversy. Some assert it to be only three; and that the sounds of the two remote were acute, and that of the intermediate one a mean between those two extremes: that Mercury, the inventor, resembled those three chords to as many seasons of the year, which were all that the Greeks reckoned, namely, Summer, Winter, and Spring; assigning the acute to the first, the grave to the second, and the mean to the third.

Others assert that the lyre had four strings; that the interval between the first and the fourth was an octave; that the second was a fourth from the first, and the fourth the same distance from the third, and that from the second to the third was a tone.

Another class of writers contend that the lyre of Mercury had seven strings. Nicomachus, a follower of Pythagoras, and the chief of them, gives the following account of the matter: "The lyre made of the shell was invented by Mercury; and the knowledge of it, as it was constructed by him of seven strings, was transmitted to Orpheus: Orpheus taught the use of it to Thamyris and Linus; the latter of whom taught it to Hercules, who communicated it to Amphion the Theban, who built the seven gates of Thebes to the seven strings of the lyre." The same author proceeds to relate "That Orpheus was afterwards killed by the Thracian women; and that they are reported to have cast his lyre into the sea, which was afterwards thrown up at Antissa, a city of Lesbos: that certain fishers finding it, they brought it to Terperander, who carried it to Egypt, exquisitely improved, and, shewing it to the Egyptian priests, assumed to himself the honour of its invention."

This difference among authors seems to have arisen from their confounding together the Egyptian and the Grecian Mercuries.—The invention of the primitive lyre with three strings was due to the first Egyptian HERMES, as mentioned under that article.—The lyre attributed to the Grecian Mercury is described by almost all the poets to be an instrument of seven strings\*. \* See *Memoires* Vincenzo Galilei has collected the various opinions of *several* the several Greek writers who have mentioned the invention of the chelys or testudo; and the late Mr Spence has done the same in a very circumstantial, but ludicrous manner. "Horace talks of Mercury as a wonderful musician, and represents him with a lyre. There is a ridiculous old legend relating to this invention, which informs us, that Mercury, after stealing some bulls from Apollo, retired to a secret grotto, which

LYRA,  
Lyre.

which he used to frequent, at the foot of a mountain in Arcadia. Just as he was going in, he found a tortoise feeding at the entrance of his cave: he killed the poor creature, and, perhaps, eat the flesh of it. As he was diverting himself with the shell, he was mightily pleased with the noise it gave from its concave figure. He had possibly been cunning enough to find out, that a thong pulled taut and fastened at each end, when struck by the finger, made a sort of musical sound. However that was, he went immediately to work, and cut several thongs out of the hides he had lately stolen, and fastened them as tight as he could to the shell of this tortoise; and, in playing with them, made a new kind of music with them to divert himself in his retreat. This, considered only as an account of the first invention of the lyre, is not altogether so unnatural."

The most ancient representations of this instrument agree very well with the account of its invention: the lyre, in particular on the old celestial globes, was represented as made of one entire shell of a tortoise; and that Amphion in the celebrated group of the Dirce, or Toro, in the Farnese palace at Rome, which is of Greek sculpture, and very high antiquity, is figured in the same manner. See Plate CLXI. fig. 9.

There have, however, been many other claimants to the seven-stringed lyre. For though Mercury invented this instrument in the manner already related, it is said he afterwards gave it to Apollo, who was the first that played upon it with method, and made it the constant companion of poetry. According to Homer's account of this transaction, in his hymn to Mercury, it was given by that god to Apollo, as a peace-offering and indemnification for the oxen which he had stolen from him:

To Phœbus Maia's son presents the lyre,  
A gift intended to appease his ire.  
The god receives it plumbly, and effays  
The novel instrument a thousand ways:  
With dextrous skill the plectrum wields; and fings,  
With voice accordant to the trembling strings,  
Such strains as gods and men approv'd, from whence  
The sweet alliance spring of sound and sense.

Diodorus informs us, that Apollo soon repenting of the cruelty with which he had treated Marsyas in consequence of their musical contest, broke the strings of the lyre, and by that means put a stop for a time to any further progress in the practice of that new instrument. "The muses (adds he) afterwards added to this instrument the string called *mesé*; Linus, that of *lichanos*; and Orpheus and Thamyras, those strings which are named *hypate* and *parhypate* (A).

Again, many ancient and respectable authors tell

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(A) It has been already related, that the lyre invented by the Egyptian Mercury had but three strings; and by putting these two circumstances together, Dr Burney observes, we may perhaps acquire some knowledge of the progress of music, or, at least, of the extension of its scale, in the highest antiquity.

*Mesé*, in the Greek music, is the fourth found of the second tetrachord of the great system, and first tetrachord invented by the ancients, answering to our A, on the fifth line in the base. If this found then was added to the former three, it proves two important points: first, that the most ancient tetrachord was that from E in the base to A; and that the three original strings in the Mercurian and Apollonian lyre were tuned E, F, G, which the Greeks called *hypate Meson*, *Parhypate Meson*, *Meson Diatonos*. The addition therefore of *Mesé* to these, completed the first and most ancient tetrachord, E, F, G, A.

The string *lichanos*, then, being added to these, and answering to our D on the third line in the base, extended the compass downwards, and gave the ancient lyre a regular series of five sounds in the Dorian mode, the most ancient of all the Greek modes; and the two strings called *hypate* and *parhypate*, corresponding with our B and C in the base, completed the heptachord, or seven sounds, B, C, D, E, F, G, A, a compass that received no addition till after the time of Pindar, who calls the instrument then in use the *seven-tongued lyre*.

us, that, before the time of Terpander, the Grecian lyre had only four strings; and, if we may believe Suidas, it remained in this state 856 years, from the time of Amphion, till Terpander added to it three new strings, which extended the musical scale to a heptachord, or seventh, and supplied the player with two conjoint tetrachords. It was about 150 years after this period, that Pythagoras is said to have added an eighth string to the lyre, in order to complete the octave, which consisted of two disjoint tetrachords.

Boethius gives a different history of the scale, and tells us, that the system did not long remain in such narrow limits as a tetrachord. Choræbus, the son of Athis, or Atys, king of Lydia, added a fifth string; Hyagnis, a sixth; Terpander, a seventh; and, at length, Lychaon of Samos, an eighth. But all these accounts are irreconcilable with Homer's hymn to Mercury, where the chelys, or telluro, the invention of which he ascribes to that god, is said to have had seven strings. There are many claimants among the musicians of ancient Greece, to the strings that were afterwards added to these, by which the scale, in the time of Aristoxenus, was extended to two octaves. Athenæus, more than once, speaks of the nine-stringed instrument; and Ion of Chios, a tragic and lyric poet and philosopher, who first recited his pieces in the 82d olympiad, 452 B. C. mentions, in some verses quoted by Euclid, the ten-stringed lyre; a proof that the third conjoint tetrachord was added to the scale in his time, which was about 50 years after Pythagoras is supposed to have constructed the octachord.

The different claimants among the Greeks to the same musical discoveries, only prove, that music was cultivated in different countries; and that the inhabitants of each country invented and improved their own instruments, some of which happening to resemble those of other parts of Greece, rendered it difficult for historians to avoid attributing the same invention to different persons. Thus the single flute was given to Minerva, and to Marfyas, the syrinx, or sifflula, to Pan, and to Cybele; and the lyre, or cithara, to Mercury, Apollo, Amphion, Linus, and Orpheus. Indeed, the mere addition of a string or two to an instrument without a neck, was so obvious and easy, that it is scarce possible not to conceive many people to have done it at the same time.

With respect to the form of the ancient lyre; as little agreement is to be found among authors as about the number of strings. The best evidences concerning it are the representations of that instrument in the hands of ancient statues, bas-reliefs, &c. See Plate CLXI.

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Fig. 9. is a representation of the *testudo*, or lyre of Amphion, in front, as it appears on the base of the celebrated *Toro Farnese* at Rome. This admirable work, consisting of four figures bigger than the life, besides the *toro*, or bull, was found in *Caracalla's* baths, where the *Farnese Hercules* was likewise discovered; and, except the *Laocoon*, is the only piece of Greek sculpture mentioned by *Pliny*, that is now remaining. The two projections near the bottom seem to have been fastenings for the strings, and to have answered the purpose of tail-pieces in modern instruments.

10. The lyre held by *Terpichore*, in the picture of that muse dug out of *Herculeanum*.

11. The Abyssinian *testudo* or lyre in use at present in the province of *Tigre*, from a drawing of *Mr Bruce's*, communicated to *Dr Burney*. "This instrument, (says he) has sometimes five, sometimes six, but most frequently seven strings, made of the thongs of raw sheep or goat skins, cut extremely fine, and twisted; they rot soon, are very subject to break in dry weather, and have scarce any found in wet. From the idea, however, of this instrument being to accompany and sustain a voice, one would think that it was better mounted formerly.

"The Abyssinians have a tradition, that the *sistrum*, lyre, and *tambourine*, were brought from Egypt into Ethiopia, by *Thot*, in the very first ages of the world. The flute, kettle-drum, and trumpet, they say, were brought from Palestine, with *Menelek*, the son of their queen of *Saba* by *Solomon*, who was their first Jewish king.

"The lyre in *Amharic* is called *beg*, 'the sheep;' in Ethiopia, it is called *mesfinko*; the verb *sinko* signifies to strike strings with the fingers: no plectrum is ever used in Abyssinia; so that *mesfinko*, being literally interpreted, will signify the 'strung instrument played upon with the fingers.'

"The sides which constitute the frame of the lyre were anciently composed of the horns of an animal of the goat kind, called *agazan*, about the size of a small cow, and common in the province of *Tigre*. I have seen several of these instruments very elegantly made of such horns, which nature seems to have shaped on purpose. Some of the horns of an African species of this animal may be seen in *M. Buffon's* history of the king of France's cabinet. They are bent, and less regular than the Abyssinian; but after fire-arms became common in the province of *Tigre*, and the woods were cut down, this animal being more scarce, the lyre has been made of a light red wood; however, it is always cut into a spiral twisted form, in imitation of the ancient materials of which the lyre was composed. The drawing I send you was one of these instruments made of wood.

"The kingdom of *Tigre*, which is the largest and most populous province of Abyssinia, and was, during many ages, the seat of the court, was the first which received letters, and civil and religious government; it extended once to the Red Sea: various reasons and revolutions have obliged the inhabitants to resign their seacoast to different barbarous nations, Pagan and Mahometans: while they were in possession of it, they say that the Red Sea furnished them with tortoise-shells, of which they made the bellies of their lyres, as the Egyptians did formerly, according to *Apollodorus* and *Lucian*; but having now lost that resource, they

have adopted, in its place, a particular species of gourd, or pumpkin, very hard and thin in the bark, still imitating with the knife the squares, compartments, and figure of the shell of the tortoise.

"The lyre is generally from three feet, to three feet six inches high; that is, from a line drawn thro' the point of the horns, to the lower part of the base of the sounding-board. It is exceedingly light, and easy of carriage, as an instrument should naturally be in so rugged and mountainous a country.

"When we consider the parts which compose this lyre, we cannot deny it the earliest antiquity. Man in his first state, was a hunter and a fisher, and the oldest instrument was that which partakes most of that state. The lyre, composed of two principal pieces, owes the one to the horns of an animal, the other to the shell of a fish.

"It is probable, that the lyre continued with the Ethiopians in this rude state, as long as they confined themselves to their rainy, steep, and rugged mountains; and afterwards, when many of them descended along the Nile in Egypt, its portability would recommend it in the extreme heats and weariness of their way. Upon their arrival in Egypt, they took up their habitation in caves, in the sides of mountains, which are inhabited to this day. Even in these circumstances, an instrument larger than the lyre must have been inconvenient and liable to accidents in those caverns; but when these people increased in numbers and courage, they ventured down into the plain, and built Thebes. Being now at their ease, and in a fine climate, all nature smiling around them, music, and other arts, were cultivated and refined, and the imperfect lyre was extended into an instrument of double its compass and volume. The size of the harp could be now no longer an objection; the Nile carried the inhabitants every where easily, and without effort; and we may naturally suppose in the fine evenings of that country, that the Nile was the favourite scene upon which this instrument was practised; at least the sphinx and lotus upon its head, seem to hint that it was somehow connected with the overflowings of that river." See *HARP*.

12. An Etruscan lyre, with seven strings, in the collection of Etruscan, Greek, and Roman antiquities, published from the cabinet of the Hon. Sir William Hamilton, Vol. I. Naples 1766. Pl. cix. With respect to this instrument, it is worthy of observation, that though the vase upon which it is represented is of such indisputable and remote antiquity, the tail-piece, bridge, belly, and sound-holes, have a very modern appearance, and manifest a knowledge in the construction of musical instruments among the Etruscans superior to that of the Greeks and Romans in much later times. The lower part of the instrument has much the appearance of an old bass-viol, and it is not difficult to discover in it more than the embryo of the whole violin family. The strings lie round, as if intended to be played on with a bow; and even the cross lines on the tail-piece are such as we frequently see on the tail-pieces of old viols.

13. The tripodian lyre of Pythagoras the Zacynthian, from a bas-relief in the *Massee* palace at Rome representing the whole choir of the muses. *Athenæus* gives the following account of this extraordinary instrument, *lib. xiv. cap. 15. p. 637*. "Many ancient instru-

**Lyre** ||  
**Lythrum.** instruments are recorded, (says Artemon), of which we have fo little knowledge, that we can hardly be certain of their exiftence; fuch as the tripod of Pythagoras the Zacynthian, which, on account of its difficulty, continued in ufe but a fhort time. It refembled in form the Delphic tripod, whence it had its name. The legs were equidiftant, and fixed upon a moveable bafe that was turned by the foot of the player; the ftirings were placed between the legs of the ftool; the vafe at the top ferved for the purpofe of a found-board, and the ftirings of the three fides of the inftrument were tuned to three different modes, the Doric, Lydian, and Phrygian. The performer fat on a chair made on purpofe; ftirking the ftirings with the fingers of the left hand, and uſing the plectrum with the right, at the ſame time turning the inftrument with his foot to whichever of the three modes he pleaſed; fo that by great practice he was enabled to change the modes with fuch velocity, that thoſe who did not fee him, would imagine they heard three different performers playing in three different modes. After the death of this admirable muſician, no other inftrument of the ſame kind was ever conſtructed."

14. A lyre in the famous ancient picture dug out of Herculesaneum, upon which Chiron is teaching the young Achilles to play. See **CHIRON**.

**LYRE**, in aftronomy. See **ASTRONOMY**, n° 206.

**LYRIC**, in general, ſignifies ſomething fung to or played on the lyre: but it is more particularly applied to the ancient odes and ftanzas anſwering to our ains and fongs, and may be played on inftruments. See **POETRY**, n° 52.

**LYSANDER**, a famous Spartan general. See **SPARTA**.

**LYSIMACHIA**, **LOOSESTRIFE**; a genus of the monogynia order, belonging to the pentandria claſs of plants. There are ten ſpecies, but only four are commonly cultivated in gardens. Theſe are hardy, herbaceous perennials and biennials, riſing with erect ſtalks from 18 inches to two or three feet high; garniſhed with narrow entire leaves; and terminated by ſpikes and cluſters of monopetalous, rotated, five-parted ſpreading flowers of white and yellow colours.—They are eaſily propagated by ſeeds, and will thrive in any foil or ſituation.

**LYSIPPUS**, a celebrated Greek ſtatuary, was born at Sicyone, and at firſt followed the buſineſs of a lockſmith, which he quitted in order to practice painting. But he afterwards applied himſelf entirely to ſculpture; in which he acquired an immortal reputation, and made a great number of ſtatues that were the admiration of the people of Athens and Rome. His grand ſtatue of the ſun repreſented in a car drawn by four horſes, was worſhipped at Rhodes: he made ſeveral ſtatues of Alexander and his favourites, which were brought to Rome by Metellus after he had reduced the Macedonian empire; and the ſtatue of a man wiping and anointing himſelf after bathing, being particularly excellent, was placed by Agrippa before his baths in that city. He lived in the time of Alexander the Great, about 334 B. C.; and left three ſons, who were all famous ſtatuiars.

**LYTHRUM**, **PURPLE LOOSESTRIFE**; a genus of the monogynia order, belonging to the dodecandria

claſs of plants. There are ten ſpecies, of which the moſt remarkable are, 1. The *ſalicaria*, or common purple looſeftrife, with oblong leaves, is a native of Britain, and grows naturally by the ſides of ditches and rivers. It hath a perennial root, from which come forth ſeveral upright angular ſtalks, riſing from three to four feet high, garniſhed with oblong leaves placed ſometimes by pairs; but ſometimes there are three leaves at each joint ſtanding round the ſtalk. The flowers are purple, and produced in a long ſpike at the top of the ſtalk; ſo make a fine appearance. 2. The *hyſpanum*, or Spaniſh looſeftrife, with an hyſſop leaf, grows naturally in Spain and Portugal. It hath a perennial root. The ſtalks are ſlender, not more than nine or ten inches long, ſpreading out on every ſide. The lower part of the ſtalks is garniſhed with oblong oval leaves placed oppoſite. The flowers come out ſingly from the ſide of the ſtalks at each joint; they are larger than thoſe of the common fort, and make a fine appearance in the month of July when they are in beauty. The firſt kind is propagated by parting the roots in autumn, but requires a moiſt ſoil;—the ſecond is propagated by ſeeds brought from thoſe countries where it is native.

**LYTTELTON** (Edward), lord Lyttelton, keeper of the great ſeal in the reign of Charles I. was eminent for his probity and his moderation at the commencement of that monarch's diſputes with his ſubjects. Without forfeiting his fidelity to the king, he preferred the eſteem of the parliament till 1644, when he was made colonel of a regiment in the king's army at York. He died in 1645. Beſides ſeveral of his ſpeeches which have been printed, he wrote reports in the common pleas and exchequer printed at London in 1683, in folio; ſeveral arguments and diſcourſes, &c.

**LYTTELTON** (George lord) eldeſt ſon of Sir Thomas Lyttelton, bart. defended from the great judge Lyttelton, was born in 1700, at ſeven months; and the midwife ſuppoſing him to be dead, threw him careleſſly into the cradle; where, had not ſome ſigns of life been taken notice of by one of the attendants, he might never have recovered. He received the elements of his education at Eaton-ſchool, where he ſhewed an early inclination to poetry. His paſtorals and ſome other light pieces were originally written in that ſeminary of learning; from whence he was removed to the univerſity of Oxford, where he purſued his claſſical ſtudies with uncommon avidity, and ſketched the plan of his Perſian Letters, a work which afterwards procured him great reputation, not only from the elegance of the language in which they were compoſed, but from the excellent obſervations they contained on the manners of mankind.

In the year 1728, he ſet out on the tour of Europe; and, on his arrival at Paris, accidentally became acquainted with the honourable Mr Poyntz, then our miniſter at the court of Verſailles; who was ſo ſtruck with the extraordinary capacity of our young traveller, that he invited him to his houſe, and employed him in many political negotiations, which he executed with great judgment and fidelity.

Mr Lyttelton's conduct, while on his travels, was a leſſon of inſtruction to the reſt of his countrymen. Inſtead of lounging away his hours at the coffee-houſes frequented.

Lyttelton, frequented by the English, and adopting the fashionable follies and vices of France and Italy, his time was passed alternately in his library, and in the society of men of rank and literature. In this early part of his life, he wrote a poetical epistle to Dr Ayscough, and another to Mr Pope, which shew singular taste and correctness.

After continuing a considerable time at Paris with Mr Poyntz, who, to use his own words, behaved like a second father to him, he proceeded to Lyons and Geneva; and from thence to Turin, where he was honoured with great marks of friendship by his Sardinian majesty. He then visited Milan, Venice, Genoa, and Rome, where he applied himself closely to the study of the fine arts; and was, even in that celebrated metropolis, allowed a perfect judge of painting, sculpture, and architecture.

During his continuance abroad, he constantly corresponded with Sir Thomas, his father. Several of his letters are yet remaining, and place his filial affection in a very distinguished light. He soon after returned to his native country, and was elected representative for the borough of Okehampton in Devonshire; and behaved so much to the satisfaction of his constituents, that they several times re-elected him for the same place, without putting him to the least expence.

About this period, he received great marks of friendship from Frederic prince of Wales, father of his present majesty; and was, in the year 1737, appointed principal secretary to his royal highness, and continued in the strictest intimacy with him till the time of his death. His attention to public business did not, however, prevent him from exercising his poetical talent. A most amiable young lady, Miss Fortescue, inspired him with a passion, which produced a number of little pieces, remarkable for their tenderness and elegance; and he had a happy facility of striking out an extempore compliment, which obtained him no small share of reputation. One evening being in company with lord Cobham and several of the nobility at Stowe, his lordship mentioned his design of putting up a bust of lady Suffolk in his beautiful gardens; and, turning to Mr Lyttelton, said, "George, you must furnish me with a motto for it." "I will, my lord," answered Mr Lyttelton; and directly produced the following couplet:

Her wit and beauty for a court were made,  
But truth and goodness fit her for a shade.

When Mr Pitt, the late earl of Chatham, lost his commission in the guards, in consequence of his spirited behaviour in parliament, Mr Lyttelton was in waiting at Leicester-house, and, on hearing the circumstance, immediately wrote these lines:

Long had thy virtue mark'd thee out for fame,  
Far, far superior to a cornet's name;  
This generous Walpole saw, and griev'd to find  
So mean a post disgrace that noble mind;  
The servile standard from thy free-born hand  
He took, and bade thee lead the patriot-band.

In the year 1742, he married Lucy, the daughter of Hugh Fortescue, Esq; of Filleigh in the county of Devon, the lady abovementioned, whose exemplary conduct, and uniform practice of religion and virtue,

established his conjugal happiness upon the most solid Lyttelton basis.

In 1744, he was appointed one of the lords commissioners of the treasury; and, during his continuance in that station, constantly exerted his influence in rewarding merit and ability. He was the friend and patron of the late Henry Fielding, James Thomson author of the Seasons, Mr Mallet, Dr Young, Mr Hammond, Mr West, Mr Pope, and Voltaire. On the death of Thomson, who left his affairs in a very embarrassed condition, Mr Lyttelton took that poet's sister under his protection. He revised the tragedy of Coriolanus, which that writer had not put the last hand to; and brought it out at the theatre-royal, Covent-garden, with a prologue of his own writing, in which he so affectingly lamented the loss of that delightful bard, that not only Mr Quin, who spoke the lines, but almost the whole audience, spontaneously burst into tears.

In the beginning of the year 1746, his felicity was interrupted by the loss of his wife, who died in the 29th year of her age; leaving him one son, Thomas, the late lord Lyttelton; and a daughter, Lucy, who some time since married lord viscount Valentia. The remains of his amiable lady were deposited at Over-Arley, in Worcester-shire; and an elegant monument was erected to her memory in the church of Hagley, which contains the following inscription written by her husband:

Made to engage all hearts, and charm all eyes:  
Tho' meek, magnanimous; tho' witty, wife;  
Polite, as all her life in courts had been;  
Yet good, as she the world had never seen:  
The noble fire of an exalted mind,  
With gentlest female tenderness combin'd.  
Her speech was the melodious voice of love,  
Her song the warbling of the vernal grove;  
Her eloquence was sweeter than her song,  
Soft as her heart, and as her reason strong.  
Her form each beauty of her mind express'd,  
Her mind was virtue by the graces dress'd.

Besides these beautiful lines, Mr Lyttelton wrote a monody on the death of his lady, which will be remembered while conjugal affection and a taste for poetry exist in this country.

His masterly observations on the conversion and apostleship of St Paul, were written at the desire of Gilbert West, Esq; in consequence of Mr Lyttelton's asserting, that, beside all the proofs of the Christian religion, which might be drawn from the prophecies of the Old Testament, from the necessary connection it has with the whole system of the Jewish religion, from the miracles of Christ, and from the evidence given of his resurrection by all the other apostles, he thought the conversion of St Paul alone, duly considered, was of itself a demonstration sufficient to prove Christianity to be a divine revelation. Mr West was struck with the thought; and assured his friend, that so compendious a proof would be of great use to convince those unbelievers that will not attend to a longer series of arguments; and time has shown he was not out in his conjecture, as the tract is esteemed one of the best defences of Christianity which has hitherto been published.



In 1754, he resigned his office of lord of the treasury, and was made cofferer to his majesty's household, and sworn of the privy-council: previous to which, he married, a second time, Elizabeth, daughter of field-marshal Sir Robert Rich, whose indiscreet conduct gave him great uneasiness, and from whom he was separated, by mutual consent, a few years after his marriage.

After being appointed chancellor and under-treasurer of the court of exchequer, he was, by letters-patent dated the 19th of November 1757, 31 Geo. II. created a peer of Great Britain, by the style and title of *Lord Lyttelton, baron of Frankley, in the county of Worcester*. His speeches on the Scotch and mutiny bills in the year 1747, on the Jew bill in 1753, and on the privilege of parliament in 1763, showed found judgment, powerful eloquence, and inflexible inte-

grity. During the last 10 years he lived chiefly in retirement, in the continual exercise of all the virtues which can ennoble private life. His last work was *Dialogues of the Dead*, in which the morality of Cambray and the spirit of Fontenelle are happily united.

He was suddenly seized with an inflammation of the bowels, in the middle of July 1773, at his seat at Hagley; which terminated in his death, on the 22d of that month. His last moments were attended with unimpaired understanding, unaffected greatness of mind, calm resignation, and humble but confident hopes in the mercy of God. As he had lived universally esteemed, he died lamented by all parties. A complete collection of his works has been published since his decease, by his nephew George Aycough, Esq.

## M.

**M** A LIQUID consonant, and the 12th letter of the alphabet.

The found of this letter is formed by shutting the lips, and thereby intercepting the breath, as it is strongly expressed through the mouth and nostrils jointly. Its sound is always the same in English; it suffers no consonant after it in the beginning of words and syllables, unless in some derived from the Greek, as *amnesty*, &c.

M, in prescription, signifies a *maniple*, or handful; and at the end of a receipt it imports *misc*, or mingle.

M, in astronomy, &c. denotes *meridional*, *southern*; sometimes *meridies*, or mid-day.

M, in law, the brand of a person convicted of manslaughter, and admitted to the benefit of clergy; it is burnt on the brawn of the left thumb.

M, among the ancients, was a numeral letter, signifying *one thousand*; and when a dash was added at the top of it, as *M̄*, it signified a *thousand times a thousand*.

MABILLON (John), a very learned writer of France in the 17th century, was born at Perre-monte, on the frontiers of Champagne, in 1632. He was educated in the university of Rheims, and afterwards entered into the abbey of the Benedictines of St Remy. In the year 1663, he was appointed keeper of the treasures and monuments of France at St Dennis: but having unfortunately broke a looking-glass there, which was pretended to have belonged to Virgil, he desired leave of his superiors to quit an employment which frequently obliged him to tell things he did not believe. Next year he went to Paris; and was very serviceable to father d'Acheri, who was desirous of having some young monk who could assist him in compiling his *Spicilegium*. This made him known. Soon after, the congregation of St Maur having formed a design of publishing new editions of the fathers, revived from the MSS. in the libraries of the Benedictines, Mabillon was charged with the edition of St Bernard, which he prepared with extraordinary dili-

gence. After that, he published many other works, which are evidences of his vast capacity and industry. In 1682, he was employed by Mr Colbert in examining some ancient titles relating to the royal family. The year following he sent him into Germany, to search the archives and libraries of the ancient abbeys, for what was most curious and proper to illustrate the history of the church in general, and that of France in particular. He has published an account of this journey. In 1685, he undertook another journey into Italy, by order of the king of France; and returned the year following with a very noble collection. He placed in the king's library above 3000 volumes of rare books, printed and in MSS. and composed two volumes of the pieces which he had discovered in that country. He was highly esteemed for his virtues as well as his learning.

MACACO, or MACAUO. See LEMUR.

MACAO, a town of China, in the province of Canton, seated in an island at the mouth of the river Tae. The Portuguese have been in possession of the harbour for 150 years. Formerly they had a great trade here; but now they have only a fort with a small garrison. The houses are built after the European manner; and there is a Chinese mandarin, as well as a Portuguese governor, to take care of the town and the neighbouring country. E. Long. 112. 13. N. Lat. 22. 12.

MACAO, in ornithology. See PSITTACUS.

MACARONI. See FOLENGIO, and the next article.

MACARONIC, or MACARONIAN, a kind of burlesque poetry, consisting of a jumble of words of different languages, with words of the vulgar tongue Latinized, and Latin words modernized. *Maccarone*, among the Italians, as has been observed by Cælius Rhodiginus, signifies a *coarse clownish man*; and because this kind of poetry is patched out of several languages, and full of extravagant words, &c. the Italians, among whom it had its rise, gave it the name of

Macaronic  
||  
Macaffar

of *macaronian*, or *macaronic* poetry. Others choose to derive it à *macaronibus*, from *macaroons*, a kind of confection made of meal not boulded, sweet-almonds, sugar, and the white of eggs, accounted a great dainty among the country-people in Italy; which, from their being composed of various ingredients, occasioned this kind of poetry, which consists of Latin, Italian, Spanish, French, English, &c. to be called by their name.

Example.—A bold fellow, in the *macaronic* style, says,

*Enflavi omnes scadrones & regimandos, &c.*

Another example:

*Archelos pistiliferos suriamque manantem,  
Et grandem esneutam quæ inopinam facta ruella est:  
Toxinumque alto troublantem corda clochero, &c.*

Theoph. Folengius, a Benedictine monk of Mantua, was the first who invented, or at least cultivated, this kind of verse. See FOLENGIO.

The best pieces of this kind are, the *Baldus* of Folengio, and *Macaronis Forza* by Stefano a Jesuit, among the Italians; and the *Reatus veritabilis super terribili esneuta passanarum de Ruellis*, among the French. The famous Rabelais first transferred the *macaronic* style out of the Italian verse into French prose; and on the model thereof formed some of the best things in his *Pantagruel*. We have little in English in the *macaronian* way; nothing scarce, but some little loose pieces collected in Camden's remains. But the Germans and Netherlands have had their *macaronic* poets; witness the *Certainum Catholicum cum Calvinistis*, of one Martinus Hamconius Frisius, which contains about 1200 verses, all the words whereof begin with the letter C.

MACARSKA, a town of Dalmatia, and capital of Primorgia, with a pretty good harbour, and a bishop's see, seated on the gulph of Venice. E. Lon. 17. 57. N. Lat. 43. 42.

MACASSAR, a considerable kingdom of the island of Celebes, in the East-Indies. The climate is very hot; and would be intolerable, were it not for the rains which fall when the sun is directly over their heads. The soil is extremely fertile, and there are ripe fruits at all times of the year. There are great numbers of monkeys, who are devoured by monstrous serpents; some of which are so large, that they will swallow one of these animals entire. The Macassars are large, robust, courageous, and greatly addicted to war. They profess the Mahometan religion.

MACASSAR, a large, strong, and handsome town of the island of Celebes, and capital of the kingdom of the island of Celebes, where the king resides. The houses are all built of wood, and supported by thick posts; and they have ladders to go up into them, which they draw up as soon as they have entered. The roofs are covered with very large leaves, which prevent the rain from entering. It is seated near the mouth of a large river, which runs through the kingdom from north to south. E. Long. 117. 55. S. Lat. 5. 0.

MACCABÆUS (Judas). See JUDAS.

MACCABEES, two apocryphal books of Scripture; so called from Judas the son of Mattathias, sur-

named *Maccabæus*, either on account of his valour, or because he bore on his standard the first letters of a sentence in Exodus, which, joined together, form the name *Maccabæe*. The Hebrews call them *The books of the Assmonæans*, because (according to Josephus and Eusebius) Mattathias was the son of *Hasmoneus*, or *Assmonæus*, which was the name of the family. The first book of the Maccabees is an excellent history; and comes nearest to the style and manner of the famous historians of any extant. It contains the history of 40 years, from the reign of Antiochus Epiphanes, to the death of Simon the high-priest; that is, from the year of the world 3829, to the year 3869, or 131 B. C. The second book of the Maccabees begins with two epistles sent from the Jews of Jerusalem to the Jews of Egypt and Alexandria, to exhort them to observe the feast of the dedication of the new altar erected by Judas on his purifying the temple. After these epistles follows the preface of the author to his history; which is an abridgment of a larger work, composed by one Jason, a Jew of Cyrene, who wrote the history of Judas Maccabæus and his brethren, and the wars against Antiochus Epiphanes, and Eupator his son. This second book does not by any means equal the accuracy and excellency of the first. It contains a history of about 15 years, from the execution of Heliodorus's commission, who was sent by Seleucus to fetch away the treasures of the temple, to the victory obtained by Judas Maccabæus over Nicanor; that is, from the year of the world 3828, to the year 3843, or 147 B. C.

MACBETH, a Scots nobleman in the 11th century, nearly allied to Duncan king of Scotland.—Not contented with curbing the king's authority, he carried his peltent ambition so far as to put him to death; and, chasing Malcolm Kenmure his son and heir into England, usurped the crown. Sward earl of Northumberland, whose daughter Duncan had married, undertook, by the order of Edward the Confessor, the protection of the fugitive prince.—He marched with an army into Scotland; defeated and killed Macbeth in Scotland; and restored Malcolm to the throne of his ancestors. Shakespeare hath made this transaction the subject of one of his best tragedies.

MACCLESFIELD, a town of Cheshire in England, seated on the edge of a forest of the same name, upon a high bank, near the river Bollin. It is a large handsome town, with a fine church, and a very high steeple. It has manufactures in mohair, twist, bat-bands, buttons, and thread. Of late there have been several fine silk-mills erected there. W. Long. 2. 10. N. Lat. 53. 15.

MACE, the second coat or covering of the kernel of the nutmeg, is a thin and membranaceous substance, of an oleaginous nature, and a yellowish colour; being met with in flakes of an inch or more in length, which are divided into a multitude of ramifications. It is of an extremely fragrant, aromatic, and agreeable flavour; and of a pleasant, but acrid, oleaginous taste.

Mace is carminative, stomachic, and astringent; and possesses all the virtues of nutmeg, but has less astringency.—The oils of mace and nutmeg, whether prepared by distillation or expression, are so much of the same nature, that they may be indiscriminately used

Macassar  
||  
Macc.

<sup>1</sup> Macedon. fed for one another on all occasions. They give ease in cholics, and often in nephritic cases, taken internally from one drop to five or six of the distilled oil, or an equal quantity of the expressed; and externally, they are of use to rub paralytic limbs: they also assist digestion; and will often stop vomitings and hiccoughs, only by being rubbed on the region of the stomach. The nurses have a custom of applying oil of mace by expression to childrens navels to ease their gripes, and that often with success; and we are assured, by authors of credit, that, when rubbed on the temples, it promotes sleep.

MACEDON, or MACEDONIA, a most celebrated kingdom of antiquity, was bounded on the east by the *Ægean* sea; on the south, by *Thessaly* and *Epirus*; on the west, by the *Adriatic*, or the *Ionian* sea; and on the north, by the river *Strymon* and the *Scardian* mountains, but afterwards by the river *Nessus* or *Nessus*. Its most ancient name was *Æmathia*, which it had from *Æmathius*, a prince of great antiquity. The name of *Macedon* was derived, according to some, from king *Macedo*, a descendant of *Deucalion*; but, according to others, this name is only a corruption of the word *Mygdonia*, one of its provinces.

In times of the remotest antiquity, Macedonia, as well as the rest of Europe, was parcelled out into a vast multitude of petty states, the names of which are now almost forgotten, and their history entirely unknown. About 795 B. C. one *Caranus*, an *Argive*, and a descendant of *Hercules*, left his country at the head of a considerable body of troops, in order to found a new colony. According to the prevailing superstition, he consulted the oracle before he set out, and was commanded to establish his empire according to the direction of the goats. *Caranus* proceeded for some time without knowing what to make of the oracle's answer. However, having entered the little kingdom of *Æmathia*, one of the ancient divisions of Macedonia, he observed a herd of goats running for shelter from a sudden storm towards the capital, then called *Edessa*, and governed by king *Midas*. Upon this, recollecting the answer, he immediately possessed himself of the city by surprize; and soon after, the whole kingdom submitted to his government. In gratitude to his conductors the goats, *Caranus* named his city *Ægeæ*, and called his people *Ægiætes*; and, in order to perpetuate the memory of this extraordinary event, he likewise made use of the figure of a goat in his standard.

The founder of the Macedonian monarchy left his kingdom to his son *Cænus*, after a reign of three years, during which he considerably enlarged his dominions. After him followed *Thurymas* and *Perdiccas* I. during whose reigns we find nothing memorable. In the reign of *Argæus*, who ascended the throne about 691 B. C. the *Illyrians*, a fierce and barbarous nation in the neighbourhood, first invaded Macedonia, and did considerable mischief; but the king having decoyed them by a stratagem, put them to flight with great slaughter, and thus delivered his kingdom from them for the present. The reign of his successor *Philip*, however, was much disturbed by the incursions of these people and the *Thracians*, as well as that of *Æropeas*; who succeeded *Philip*.

In the mean time, the states of Greece had begun to  
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emerge from their barbarism, and the eastern part of the world was almost totally subjected to *Cyrus* the first monarch of *Persia*. At this critical period *Alcetas* began to reign over Macedonia; but had the good fortune to preserve his dominions from the encroachments of the Greeks on the one hand, and the usurpation of the Persians on the other. In the reign of *Amyntas* his successor, *Megabazus* sent seven of the principal commanders of his army, requiring him to acknowledge king *Darius* for his sovereign. These ambassadors, however, were all murdered by the contrivance of *Alexander* the king of Macedonia's son, on account of their attempting to violate some of the Macedonian women. This rash action threatened the entire ruin of the kingdom; but *Alexander* found means to pacify the Persian general sent against him, by giving him in marriage his sister *Gygæa*, a very beautiful woman, with whom the Persian fell in love as soon as he saw her. Thenceforward the Macedonian kings became dependent on the emperors of Persia, and were always regarded as faithful friends and allies.

The alliance of *Amyntas* with *Bubaris*, the Persian general, who had married his daughter, proved of great service to the Macedonians. Through the interest of his son-in-law, *Amyntas* obtained the country lying near mount *Hæmus* and *Olympus*; and at the same time the city of *Alabanda* in *Phrygia* was given to one *Amyntas*, the nephew of *Alexander*. After the battle of *Salamis*, *Mardonius* was left with an army of 400,000 men to attempt the conquest of Greece by land; and at that time Macedonia and the neighbouring countries are said to have augmented the Persian army with 200,000 recruits. Some cities, however, adhered to the Grecian interest, particularly *Potidea*, *Olynthus*, and *Pallene*. The two last were taken, and the inhabitants massacred by the Persians; but *Potidea* escaped, by the sea breaking into the Persian camp, and there making great desolation. *Alexander* afterwards gained the favour of the Greeks by giving them intelligence of the time when *Mardonius* designed to attack them; and thus freed his country from any danger that might have happened on account of the assistance which had been given to the Persians. The other transactions of his reign, however, are totally unknown.

*Perdiccas* II. the son of *Alexander*, began his reign in a very embarrassed situation. The *Thracians* and other barbarous nations looked with a jealous eye on his increasing kingdom; the Persians treated him as their vassal; and the Athenians were become so powerful by their colonies and allies on the sea-coast, that he was in no small danger from them. The king, however, was a man of great abilities and prudence. For some time he amused the Athenians with a shew of friendship; but, finding, that they treated him with haughtiness, he resolved to check their rising power in that part of the world. An occasion for this soon offered, and a war ensued; which, however, was not attended with any material advantage on either side, and *Perdiccas* died without being able to accomplish his schemes. After his death, the kingdom of Macedonia seemed to decline; inasmuch, that the states of Greece became ardent with regard to its affairs; and we find *Perdiccas* III. raised to the throne by the decision of *Pelopidas* the Theban. *Philip*, the new king's brother,



<sup>5</sup> Macedon. ther, went along with Pelopidas to Thebes; where he was educated by the celebrated Epaminondas, and where he became such a proficient in the arts of policy as well as war, that all the powers of Greece were not able to resist him. Perdiccas in the mean time governed the Macedonians with tolerable good fortune; till he engaged in a war with the Illyrians, by whom he was defeated and killed, and the kingdom left seemingly on the verge of destruction.

<sup>6</sup> Perdiccas defeated and killed.

<sup>7</sup> Philip takes upon him the government.

Perdiccas left an infant-son, named Amyntas: but the emergency of public affairs required that some able and experienced person should hold the reins of government; and therefore Philip, whose ambition at any rate was boundless, set out immediately from Thebes, in order to take possession of the kingdom. Though only 22 years of age, he was far from sinking under the load of public affairs, even in their most desperate state. In order to establish himself firmly on the throne, he first applied to the army, whom he caressed with the strongest expressions of friendship; and then to the nobility, whom he gained over to his interest by the strongest testimonies of confidence, and by vast promises. He next gave a check to the Athenian power, by declaring Amphipolis, over which the Athenians claimed a jurisdiction, to be a free city. The chief men in Pæonia he gained by presents; and in the same way he persuaded his rival Pausanias to drop his claim to the crown of Macedon; after which, having entirely set aside Amyntas, whose guardian he had hitherto pretended to be, he caused himself to be declared king of Macedon.

<sup>8</sup> Defeats the Athenians.

The next care of Philip was to introduce a more strict discipline among the troops; which he had partly learned from the Thebans, and partly invented himself. He particularly instituted, or rather modelled, the phalanx; taught the soldiers how to become more formidable from order, and a just conception of the rules of war, than they could be from mere force; and by the help of frequent instructions, kind language, and sometimes severity, he at length attained his end.—An opportunity soon offered of trying how much his soldiers had profited by his instructions. Argæus, an Athenian commander, had advanced with an army of mercenaries as far as Egæ, but was obliged by the inhabitants to retire. Philip pursued him, and defeated his troops with great slaughter: and this first instance of success greatly revived the spirits of the Macedonians; while the king secured to himself the reputation of clemency, by admitting to a capitulation a considerable body of the enemy that had retired to an eminence.

<sup>9</sup> Reduces Pæonia, and defeats the Illyrians.

This victory, together with Philip's renouncing his right to Amphipolis, procured a peace with the Athenians; and soon after Agis, king of Pæonia, another of his enemies, was taken off by death. This news no sooner reached the ears of the Macedonian monarch, than he invaded Pæonia, took most of the cities, and obliged the inhabitants to own themselves his subjects. After this success he marched without delay against the Illyrians, defeated them with great slaughter, and obliged them to abandon all their conquests. No sooner was this important victory gained, than Philip began to meditate greater things, and to put them in execution almost as soon as they came into his mind. He suddenly sat down with his army

before the city of Amphipolis, in order to lay siege to it. The inhabitants sent deputies to Athens, to implore the protection of that state; but, as Philip pretended that he would deliver up the city to the Athenians as soon as he had taken it, the request of the Amphipolitans was disregarded. The town was taken by storm, and Philip put to death or banished such as were not in his interest; and then, instead of delivering it to the Athenians, he attacked Pydna and Potidea, in the last of which was an Athenian garrison. This garrison he dismissed with honour, and then delivered the city to the Olynthians; according to a maxim he very frequently made use of, namely, that those are to be obliged whom we cannot overcome.

After these victories, Philip determined to make himself master of the country between the river Strimon and the Nessus, on account of the gold with which it abounded. At that time it was possessed by the Thracians, who had fortified *Crenides* its capital city; but Philip took the city by surprise, and quickly made himself master of the whole district. The name of the city he changed to *Philippi*; and gave directions for working the gold mines to greater advantage than before, by which means he established a revenue from that country of 1000 talents per annum.

At this time all Greece was in confusion on account of the *Phocian*, or (as it was called) the *sacred*, war; the occasion of which was as follows. The Phocians had ploughed some of the lands belonging to the Delphic Apollo; for which they were fined by the Amphictyons, or states-general of Greece: but, instead of submitting to the judgment of that court, the Phocians, at the instance of Philomelus, a bold and daring speaker, seized on the temple itself, and all the riches belonging to Apollo. This immediately set all Greece in a flame. The Locrians and Boeotians made war on the Phocians; and to countenance their cause, called it *sacred*. The Phocians, on the other hand, pretended that they were far from being sacrilegious persons; for that they meddled not at all with the riches of the temple, but only refused the honour of protecting it, which had belonged to their ancestors: and the better to support their arguments, they prevailed on the Athenians and Lacedæmonians to become their allies. The war was carried on a long time with various success; sometimes the Phocians, and sometimes the Thebans prevailing. However, it was generally thought that the Athenians acted unworthily in sending such great supplies as they did to the Phocians, (at one time 5000 foot and 300 horse); and this the rather, because it was known that they had few other motives than the great pay which was given to their troops; and as the money expended on this occasion was raised either by the coinage or sale of the dedicated things in the temple of Delphos, it was considered as sacrilege to receive any part of this theft, especially for defending the robbers.—Of this war Philip took the advantage in order to extend his territories without interruption. It also produced various applications from the contending parties in order to procure his assistance, which soon produced a very considerable alteration in favour of the Macedonian affairs.

Philip's first enterprize was the reduction of the city of Methone; after which he entered Theffaly, being

<sup>10</sup> Takes Amphipolis, Pydna, and Potidea.

<sup>11</sup> Reduces the country between the Strimon and the Nessus.

<sup>12</sup> Origin of the Phocian or sacred war.

<sup>13</sup> Reduces Theffaly, and being

Macedon.

being invited thither by the petty princes of the country, who were oppressed by the tyranny of Lycophron the brother of Alexander of Pheræa. The tyrant demanded assistance from Onomarchus the Phocian general; but notwithstanding their assistance, both he and his allies were driven out of Theffaly. Upon this, Onomarchus marched against Philip with all his forces, defeated him in two engagements, and drove him out of Theffaly in his turn in great distress. After this disaster, Philip applied himself with all possible diligence to the recruiting of his army; and having prevailed on the Theffalians to exert themselves in his favour, at last defeated and killed Onomarchus with the loss of great part of his army. Philip caused the body of the slain general to be hung up with ignominy; and denied also funeral rites to all that were slain, looking upon them as sacrilegious persons on account of the violence offered to the possessions of Apollo. Lycophron, and his brother Pitholaus, seeing no hopes of retaining their principality, were content to resign it; and being dismissed on giving their oaths to be quiet, they delivered up the city of Pheræa into the hands of Philip: who, as he had promised to the Theffalians, restored all the cities to liberty; and having thereby secured the friendship of so powerful a nation, he attempted to pass through the Pylæ, in order to make war on the Phocians.

15  
Is hindered by the Athenians from entering Greece.

This was a very bold attempt, and failed not to alarm all Greece; for since the defeat of the Persians at Platæa, no Macedonian prince had ever set his foot in Greece. The Athenians, therefore, being informed of his design, marched with the utmost expedition, seized the passes, and obliged him for that time to abandon his purpose, and return into Macedon.— This produced an implacable hatred between Philip and the Athenians; for the ruin of whose power he instantly began to form schemes, as he saw they were the only people in Greece who were capable of opposing his designs. He began with reducing some neutral cities; and at last laid siege to Olynthus, a place of very great importance, and which he himself had hitherto owned to be free and independent. This city held the balance of power between Athens and Macedon; and therefore Demosthenes, the celebrated Athenian orator, used all his influence with his countrymen to send sufficient assistance to the Olynthians. Through the negligence or volatility of that people, however, these succours were delayed till the city was taken by treachery, the houses plundered, and the inhabitants sold for slaves.

16  
Takes Olynthus.

Philip's chief hope was in putting an end to the Phocian war; for which purpose he affected a neutrality, that he might thereby become the arbiter of Greece. His hopes were well founded; for the Thebans, who were at the head of the league against the Phocians, solicited him on the one side, and the states confederate with the Phocians did the like on the other. He answered neither, yet held both in dependence. In his heart he favoured the Thebans, or rather placed his hopes of favouring his own cause on that state; for he well knew, that the Athenians, Spartans, and other states allied with Phocis, would never allow him to pass Thermopylæ, and lead an army into their territories. So much respect, however, did he shew to the ambassadors from these states, parti-

cularly Ctesiphon and Phrynion, who came from A-  
thens, that they believed him to be in their interest, and reported as much to their masters. The Athenians, who were now dissolved in ease and luxury, received this news with great satisfaction; and named immediately ten plenipotentiaries to go and treat of a full and lasting peace with Philip. Among these plenipotentiaries were Demosthenes and Æschines, the most celebrated orators in Athens. Philip gave directions, that these ambassadors should be treated with the utmost civility; naming, at the same time, three of his ministers to confer with them, viz. Antipater, Parmenio, and Eurylochus. Demosthenes being obliged to return to Athens, recommended it to his colleagues not to carry on their negotiations with Philip's deputies; but to proceed with all diligence to court, there to confer with the king himself. The ambassadors, however, were so far from following his instructions, that they suffered themselves to be put off for three months by the arts of Philip and his ministers.

17  
Over-reaches the Athenians, and at last concludes a peace.

In the mean time, the king took from the Athenians such places in Thracæ as might best cover his frontiers; giving their plenipotentiaries, in their stead, abundance of fair promises, and the strongest assurances that his good-will should be as beneficial to them as ever their colonies had been. At last a peace was concluded; but then the ratification of it was deferred till Philip had possessed himself of Pheræa in Theffaly, and saw himself at the head of a numerous army; then he ratified the treaty; and dismissed the plenipotentiaries with assurances, that he would be ready at all times to give the Athenians proofs of his friendship. On their return to Athens, when this matter came to be debated before the people, Demosthenes plainly told them, that, in his opinion, the promises of Philip ought not to be relied on, because they appeared to be of little significance in themselves, and came from a prince of so much art, and so little fidelity, that they could derive no authority from their maker. Æschines, on the other hand, gave it as his sentiment, that the king of Macedon's assurances ought to give them full satisfaction. He said, that, for his part, he was not politician enough to see any thing of disguise or dissimulation in the king's conduct; that there was great danger in distrusting princes; and that the surest method of putting men upon deceit, was to shew that we suspected them of it. The rest of the plenipotentiaries concurred with Æschines; and the people, desirous of quiet, and addicted to pleasure, easily gave credit to all that was said, and decreed that the peace should be kept. All this was the easier brought about, because Phocion, the worthiest man in the republic, did not oppose Philip; which was owing to his having a just sense of the state his country was in. He conceived, that the Athenians of those times were nothing like their ancestors; and therefore, as he expressed himself on another occasion, he was desirous, since they would not be at the head of Greece themselves, that they would at least be upon good terms with that power which would be so.

Philip, who knew how to use as well as to procure  
opportunity, while the Athenians were in this good Thermo-  
humour, passed Thermopylæ, without their knowing pylæ, and  
whether he would fall on Phocis or Thebes; but the Phocian  
quickly undeceived them, by commanding his soldiers war,

18

Maecdon. to put on crowns of laurel, declaring them thereby the troops of Apollo, and himself the lieutenant-general of that god. He then entered Phocis with an air of triumph; which so terrified the Phocians, whom he had caused to be proclaimed sacrilegious persons, that they immediately dismissed all thoughts of defence, and without more ado submitted to his mercy. Thus the Phocian war, which had so long employed all Greece, was ended without a stroke; and the judgment on the Phocians remitted to the Amphictyons, or grand council of Greece. By their decree the walls of three Phocian cities were demolished, the people were forbid to inhabit in any but villages, to pay a yearly tribute of 60 talents, and never to make use either of houses or arms, till they had repaid to the temple of Apollo the money they had sacrilegiously carried from thence. Their arms were taken from them, broken to pieces, and burnt; their double voice in the council was taken from them, and given to the Macedonians. Other orders were made for settling the affairs both of religion and state throughout Greece: all of which were executed by Philip with great exactness and moderation; he paying the most profound respect to the council; and, when he had performed its commands, retiring peaceably with his army back to Macedon, which gained him great reputation.

19  
Is again  
opposed by  
the Athenians.

At Athens alone, the justice and piety of Philip was not understood. The people began to see, though a little too late, that they had been abused and deceived by those who had negotiated the late peace. They saw, that, through their acceptance of it, the Phocians were destroyed; that Philip was become master of Thermopylae, and might enter Greece when he pleased; that, in abandoning their allies, they had abandoned themselves; and that, in all probability, they might soon feel the weight of his power, whom they had so foolishly trusted: they therefore began to take new and hostile measures; they ordered, that the women should retire out of the villages into the city, their walls to be repaired, and their forts new strengthened. They seemed inclined to question Philip's election into the council of the Amphictyons, because it had been done without their consent; and even to proceed to an open war. In all likelihood they had carried things to extravagancy, if Demosthenes had not interposed. He told them, that though he was not for making the peace, he was however for keeping it; and that he saw no manner of occasion for their maintaining into so unequal a contest as would needs ensue, if they took up arms, not only against Philip, but against all the states concurring with him in the late transactions. This seems to have cooled the rage of the Athenians; and to have brought them to think of *ruining* Philip by degrees, as by degrees they had *raised* him.

20  
Pursues his  
conquests  
in Thrace.

The fame of his achievements without the bounds of Macedon having disposed the subjects of Philip to hope every thing from his conduct, and the several states of Greece to desire above all things his friendship; that prudent monarch laid hold of this favourable situation to fix his dominion on such a stable foundation as that a reverse of fortune should not immediately destroy it. To this end, while he carried on his negotiations through Greece, he likewise kept his army in exercise, by taking several places in Thrace,

which terribly incommoded the Athenians. Diophanes, who had the government of the Athenian colonies in those parts, perceiving well what end Philip had in view, did not stay for instructions from home; but having raised with much expedition a considerable body of troops, taking advantage of the king's being absent with his army, entered the adjacent territories of Philip, and waited them with fire and sword.

The king, who on account of the operations of the campaign in the Chersonese, was not at leisure to repel Diophanes by force, nor indeed could divide his army without imminent hazard, chose, like an able general, rather to abandon his provinces to insults, which might be afterwards revenged, than, by following the dictates of an ill-timed passion, to hazard the loss of his veteran army, whereon lay all his hopes. He contented himself, therefore, with complaining to the Athenians of Diophanes's conduct, who in a time of peace had entered his dominions, and committed such devastations as could scarce have been justified in a time of war. His partisans supported this application with all their eloquence. They told the Athenians, that unless they recalled Diophanes, and brought him to a trial for this infringement of the peace, they ought not to hope either for the friendship of Philip, or of any other prince or state; neither could they justly complain, if, prompted by such a precedent, others should break faith with them, and fall without the least notice upon their dominions. Demosthenes defended Diophanes; and undertook to shew, that he deserved the praise and not the censure of the Athenians. Those of the other party began then to charge him with crimes of a different nature; they alleged, that he oppressed the subjects and maltreated the allies of Athens. Demosthenes replied, that of these things there were as yet no proofs; that when such should appear, a single galley might be sent to bring over Diophanes to abide their judgment, but that Philip would not come if they sent a fleet; whence he inferred, that they ought to be cautious, and to weigh well the merits of this cause before they took any resolution. He said, that it was true, Philip had not as yet attacked Attica, or pretended to make a descent on their territories in Greece, or to force his way into their ports; when it came to that, he was of opinion they would be hardly able to defend themselves; wherefore he thought such men were to be esteemed as fought to protect their frontiers, in order to keep Philip as long as might be at a distance: whereupon he moved, that, instead of disowning what Diophanes had done, or directing him to dismiss his army, they should send him over recruits, and show the king of Macedon, they knew how to protect their territories, and to maintain the dignity of their state, as well as their ancestors. The arguments had such an effect, that a decree was made conformable to his motion.

While affairs stood thus, the Illyrians recovering courage, and seeing Philip at such a distance, harassed the frontiers of Macedon, and threatened a formidable invasion: but Philip, by quick marches, arrived on the borders of Illyrium; and struck this barbarous people with such a panic, that they were glad to compound for their former depredations at the price he was pleased to set. Most of the Greek cities in Thrace

Maecdon.

21  
His dominions  
invaded by  
Diophanes.

22  
Who is de-  
fended by  
Demosthe-  
nes.



Macedon. now fought the friendship of the king, and entered into a league with him for their mutual defence. As it cannot be supposed, that each of these free cities had a power equal to that of Philip, we may therefore look upon him as their protector. About this time, Philip's negotiations in Peloponnesus began to come to light : the Argives and Messenians, growing weary of that tyrannical authority which the Spartans exercised over them, applied to Thebes for assistance ; and the Thebans, out of their natural aversion to Sparta, sought to open a passage for Philip into Peloponnesus, that, in conjunction with them, he might humble the Lacedæmonians. Philip readily accepted the offer ; and resolved to procure a decree from the Amphictyons, directing the Lacedæmonians to leave Argos and Messene free ; which if they complied not with, he, as the lieutenant of the Amphictyons, might, with great appearance of justice, march with a body of troops to enforce their order. When Sparta had intelligence of this, she immediately applied to Athens, earnestly intreating assistance, as in the common cause of Greece. The Argives and Messenians, on the other hand, laboured assiduously to gain the Athenians to their side ; alleging, that, if they were friends to liberty, they ought to assist those whose only aim was to be free. Demosthenes, at this juncture, outwitted Philip, if we may borrow that king's expression : for, by a vehement harangue, he not only determined his own citizens to become the avowed enemies of the king ; but also made the Argives and Messenians not over fond of him for an ally ; which when Philip perceived, he laid aside all thoughts of this enterprize for the present, and began to practise in Eubœa.

This country, now called *Negropent*, is separated from Greece by the Euripus, a strait so narrow, that Eubœa might easily be united to the continent. This situation made Philip call it *the fetters of Greece*, which he therefore sought to have in his own hands. There had been for some years great disturbances in that country ; under colour of which, Philip sent forces thither, and demolished Porthmos, the strongest city in those parts, leaving the country under the government of three lords, whom Demosthenes roundly calls *tyrants* established by Philip. Shortly after, the Macedonians took Oreus, which was left under the government of five magistrates, styled also *tyrants* at Athens. Thither Plutarch of Eretria, one of the most eminent persons in Eubœa, went to represent the distresses of his country, and to implore the Athenians to set it free. This suit Demosthenes recommended warmly to the people ; who sent thither their famous leader Phocion, supported by formidable votes, but a very slender army : yet so well did he manage the affairs of the commonwealth and her allies, that Philip quickly found he must for a time abandon that project ; which, however, he did not till he had formed another no less beneficial to himself, or less dangerous to Athens. It was, the prosecution of his conquests in Thrace, which he thought of pushing much farther than he had hitherto done, or could be reasonably suspected to have any intention of doing.

Extraordinary preparations were made by the Macedonian monarch for this campaign. His son Alexander was left regent of the kingdom ; and he himself with 30,000 men laid siege to Perinthus, one of the

strongest cities in the country. At present, however, all his arts of cajoling and pretending friendship were insufficient to deceive the Athenians. They gave the command of their army and fleet to Phocion ; a general of great abilities, and with whom Philip would have found it very hard to contend. On the other hand, the king of Persia began to turn jealous of the growing power of the Macedonian monarch. The Persian kings had been accustomed to regard those of Macedon as their faithful allies ; but the good fortune of Philip, the continual clamour of the Athenians against him, and his dethroning at pleasure the petty princes of Thrace, made him now regarded in another light. When therefore he led his troops against Perinthus, the Great King, as he was styled by the Greeks, sent his letters mandatory to the governors of the maritime provinces, directing them to supply the place with all things in their power ; in consequence of which they filled it with troops, granted subsidies in ready money, and sent besides great convoys of provision and ammunition. The Byzantines also, supposing their own turn would be next, exerted their utmost endeavours for the preservation of Perinthus ; sending thither the flower of their youth, with all other necessaries for an obstinate defence. The consequence of all this was, that Philip found himself obliged to raise the siege with great loss.

That the reputation of the Macedonian arms might not sink by this disgrace, Philip made war on the Scythians and Triballi, both of whom he defeated ; and then formed a design of invading Attica, though he had no fleet to transport his troops, and knew very well that the Thessalians were not to be depended upon if he attempted to march through the Pissæ, and that the Thebans would even then be ready to oppose his march. To obviate all these difficulties, he had recourse to Athens itself ; where, by means of his partisans, he procured his old friend Æschines to be sent their deputy to the Amphictyons. This seemed a small matter, and yet was the hinge on which his whole project turned. By that time Æschines had taken his seat, a question was stirred in the council, whether the Locrians of Amphissia had not been guilty of sacrilege in ploughing the fields of Cyrrha in the neighbourhood of the temple of Delphi. The assembly being divided in their opinions, Æschines proposed to take a view, which was accordingly decreed. But when the Amphictyons came in order to see how things stood, the Locrians, either jealous of their property, or spurred thereto by the suggestions of some who saw farther than themselves, fell upon those venerable persons so rudely, that they compelled them to secure themselves by flight. The Amphictyons decreed, that an army should be raised, under the command of one of their own number, to chastise the delinquents ; but as this army was to be composed of troops sent from all parts of Greece, the appearance at the rendezvous was so inconsiderable, that the Amphictyons sent to command them durst undertake nothing. The whole matter being reported to the council, Æschines, in a long and eloquent harangue, shewed how much the welfare and even the safety of Greece depended on the deference paid to their decrees ; and after inveighing against the want of public spirit in such as had not sent their quotas at the time appointed by the council,

Macedon.

cil, he moved that they should elect Philip for their general, and pray him to execute their decree. The deputies from the other states, conceiving that by this expedient their respective constituents would be free from any farther trouble or expence, came into it at once; whereupon a decree was immediately drawn up, purporting that ambassadors should be sent to Philip of Macedon in the name of Apollo and the Amphictyons, once more to require his assistance, and to notify to him, that the states of Greece had unanimously chosen him their general, with full power to act as he thought fit against such as had opposed the authority of the Amphictyons. Thus of a sudden Philip acquired all that he sought; and having an army ready in expectation of this event, he immediately marched to execute the commands of the Amphictyons in appearance, but in reality to accomplish his own designs. For having passed into Greece with his army, instead of attacking the Locrians, he seized immediately upon Elatea a great city of Phocis upon the river Cephissus.

25  
Is chosen  
general by  
the Am-  
phictyons.

26  
Is opposed  
by the  
Athenians  
and The-  
bans.

The Athenians in the mean time were in the utmost confusion on the news of Philip's march. However, by the advice of Demosthenes, they invited the Thebans to join them against the common enemy of Greece. Philip endeavoured as much as possible to prevent this confederacy from taking place; but all his efforts proved ineffectual. The Athenians raised an army, which marched immediately to Eleusis, where they were joined by the Thebans. The confederates made the best appearance that had ever been seen in Greece, and the troops were exceedingly good; but unfortunately the generals were men of no conduct, or skill in the military art. An engagement ensued at Cheronea; wherein Alexander commanded one wing of the Macedonian army, and his father Philip the other. The confederate army was divided according to the different nations of which it consisted; the Athenians having the right, and the Boeotians the left. In the beginning of the battle the confederates had the better; whereupon Stratocles an Athenian commander cried out, "Come on, brother soldiers, let us drive them back to Macedon;" which being overheard by the king, he said very coolly to one of his officers, "These Athenians do not know to conquer." Upon this he directed the files of the phalanx to be straitened; and, drawing his men up very close, retired to a neighbouring eminence; from whence, when the Athenians were eager in their pursuit, he rushed down with impetuosity, broke, and routed them with prodigious slaughter. The orator Demosthenes behaved very unbecomingly in this engagement; for he deserted his post, and was one of the first that fled: nay, we are told, that a slave catching hold of his robe, he, not doubting but it was an enemy, cried out, "Alas! spare my life."

28  
Is appointed  
general  
against the  
Persians.

This victory determined the fate of Greece, and from this time we must reckon Philip supreme lord of all the Grecian states. The first use he made of his power was to convoke a general assembly, wherein he was recognized generalissimo, and with full power appointed their leader against the Persians. Having, by virtue of his authority, settled a general peace among them, and appointed the quota that each of the states should furnish for the war, he dismissed them; and returning to Macedon, began to make great prepara-

tions for this new expedition. His pretence for making war on the Persians at this time was the assistance given by the Persians to the city of Perinthus, as already mentioned. In the mean time, however, the king, by reason of the dissensions which reigned in his family, was made quite miserable. He quarrelled with his wife Olympias to such a degree, that he divorced her, and married another woman named *Cleopatra*. This produced a quarrel between him and his son Alexander; which also came to such an height, that Alexander retired into Epirus with his mother. Some time afterwards, however, he was recalled, and a reconciliation took place in appearance; but in the mean time a conspiracy was formed against the king's life, the circumstances and causes of which are very much unknown. Certain it is, however, that it took effect, as the king was exhibiting certain shows in honour of his daughter's marriage with the king of Epirus. Philip, having given a public audience to the ambassadors of Greece, went next day in state to the theatre. All the seats were early taken up; and the shows began with a splendid procession, wherein the images of the 12 superior deities of Greece were carried, as also the image of Philip, habited in like manner, as if he now made the 13th, at which the people shouted aloud. Then came the king alone, in a white robe, crowned, with his guards at a considerable distance, that the Greeks might see he placed his safety only in his confidence of the loyalty of his subjects. Pausanias, the assassin, however, had fixed himself close by the door of the theatre; and observing that all things fell out as he had foreseen they would, took his opportunity when the king drew near him, and plunging his sword in his left side, laid him dead at his feet. He then fled, as fast as he was able, towards the place where his horses were; and would have escaped, had not the twig of a vine caught his shoe, and thrown him down. This gave time to those who pursued him to come up with him; but instead of securing him, in order to extort a discovery of his accomplices, they put an end to his life.

29  
Is mur-  
dered.

No sooner did this news reach Athens, than, as if Extrava-  
all danger had been past, the inhabitants shewed the  
most extravagant signs of joy. Demosthenes and his  
party put on chaplets of flowers, and behaved as if  
they had gained a great victory. Phocion reproved  
them for this madness; bidding them remember, that  
"the army which had beaten them at Cheronea was  
lessened but by one." This reproof, however, had  
very little effect. The people heard with pleasure all  
the harsh things which the orators could say of the  
young Alexander king of Macedon, whom they re-  
presented as a giddy wrong-headed boy, ready to grasp  
all things in his imagination, and able to perform no-  
thing. The affairs of Macedon indeed were in a very  
distracted state on the accession of Alexander: for all  
the neighbouring nations had the same notion of the  
young king with the Athenians; and being irritated  
by the usurpations of Philip, immediately revolted;  
and the states of Greece entered into a confederacy  
against him. The Persians had been contriving to  
transfer the war into Macedon; but as soon as the  
news of Philip's death reached them, they behaved as  
if all danger had been over. At the same time Attalus,  
one of the Macedonian commanders, aspired to the  
crown,

Macedon.

<sup>31</sup> Macedon. crown, and fought to draw off the soldiers from their allegiance.

In the councils held on this occasion, Alexander's best friends advised him rather to make use of dissimulation than force, and to cajole those whom they thought he could not subdue. These advices, however, were ill-suited to the temper of their monarch. He thought that vigorous measures only were proper, and therefore immediately led his army into Thessaly. Here he harangued the princes so effectually, that he thoroughly gained them over to his interests, and was by them declared general of Greece; upon which he returned to Macedon, where he caused Attalus to be seized and put to death.

<sup>32</sup> Alexander declared general of Greece. In the spring of the next year (335 B. C.) Alexander resolved to subdue the Triballians and Illyrians, who inhabited the countries now called *Bulgaria* and *Sclavonia*, and had been very formidable enemies to the Macedonian power. In this expedition he discovered, though then but 20 years of age, a surprising degree of military knowledge. Having advanced to the passes of Mount Hæmus, he found that the barbarians had posted themselves in the most advantageous manner. On the tops of the cliffs, and at the head of every passage, they had placed their carriages and waggons in such a manner as to form a kind of parapet with their shafts inwards, that, when the Macedonians should have half ascended the rock, they might be able to push these heavy carriages down upon them. They reckoned the more upon this contrivance, because of the close order of the phalanx, which, they imagined, would be terribly exposed by the soldiers wanting room to stir, and thereby avoid the falling waggons. But Alexander, having directed his heavy-armed troops to march, gave orders, that, where the way would permit, they should open to the right and left, and suffer the carriages to go through; but that, in the narrow passes, they should throw themselves on their faces with their shields behind them, that the carts might run over them. This had the desired effect; and the Macedonians reached the enemies works without the loss of a man. The dispute was then quickly decided; the barbarians were driven from their posts with great slaughter, and left behind them a considerable booty for the conquerors.

The next exploits of Alexander were against the Getæ, the Tanlantii, and some other nations inhabiting the country on the other side of the Danube. Them he also overcame; showing in all his actions the most perfect skill in military affairs, joined with the greatest valour. In the mean time, however, all Greece was in commotion by a report which had been confidently spread abroad, that the king was dead in Illyria. The Thebans, on this news, seized Amyntas and Timolaus, two eminent officers in the Macedonian garrison which held their citadel, and dragged them to the market-place, where they were put to death without either form or process, or any crime alleged against them. Alexander, however, did not suffer them to remain long in their mistake. He marched with such expedition, that in seven days he reached Pallene in Thessaly; and in six days more he entered Boeotia, before the Thebans had any intelligence of his passing the straits of Thermopylæ. Even then they would not believe that the king was alive; but insisted that the

Macedonian army was commanded by Antipater, or by one Alexander the son of Æropus. The rest of the Greeks, however, were not so hard of belief; and therefore sent no assistance to the Thebans, who were thus obliged to bear the consequences of their own folly and obstinacy. The city was taken by storm, and the inhabitants were for some hours massacred without distinction of age or sex; after which the houses were demolished, all except that of Pindar the famous poet, which was spared out of respect to the merit of its owner, and because he had celebrated Alexander I. king of Macedon. The lands, excepting those destined to religious uses, were shared among the soldiers, and all the prisoners sold for slaves; by which 440 talents were brought into the king's treasury.

By this severity the rest of the Grecian states were so thoroughly humbled, that they thought no more of making any resistance, and Alexander had nothing further to hinder him from his favourite project of invading Asia. Very little preparation was necessary for the Macedonian monarch, who went out as to an assured conquest, and reckoned upon being supplied only by the spoils of his enemies. Historians are not agreed as to the number of his army. Arrian says, that there were 30,000 foot and 5000 horse. Diodorus Siculus tells us, that there were 13,000 Macedonian foot, 7000 of the confederate states, and 5000 mercenaries. These were under the command of Parmenio. Of the Odrysians, Triballians, and Illyrians, there were 5000; and of the Agrians, who were armed only with darts, 1000. As for the horse, he tells us there were 1800 commanded by Philotas; and as many Thessalians, under the command of Callas: out of the confederate states of Greece, were 600 commanded by Eurygius; and 900 Thracians and Peonians, who led the van under Callander. Plutarch tells us, that, according to a low computation, he had 30,000 foot and 5000 horse; and, according to the largest reckoning, he had 34,000 foot and 4000 horse. As to his fund for the payment of the army, Aristobolus says it was but 70 talents; and Onesicritus, who was also in this expedition, not only takes away the 70 talents, but affirms that the king was 200 in debt. As for provisions, there was just sufficient for a month and no more; and to prevent disturbances, Antipater was left in Macedon with 12,000 foot and 1500 horse.

The army having assembled at Amphipolis, he marched from thence to the mouths of the river Strymon; then crossing mount Pangæus, he took the road to Abdera. Crossing the river Eubrus, he proceeded through the country of Pædis, and in 20 days reached Seïtos; thence he came to Eleus, where he sacrificed on the tomb of Proteusians, because was the first among the Greeks who, at the siege of Troy, set foot on the Asiatic shore. He did this, that his landing might be more propitious than that of the hero to whom he sacrificed, who was slain soon after. The greatest part of the army, under the command of Parmenio, embarked at Seïtos, on board a fleet of 160 galleys of three benches of oars, besides small craft. Alexander himself sailed from Eleus; and, when he was in the middle of the Hellespont, offered a bull to Neptune and the Nereids, pouring forth at the same time a libation from a golden cup. When he drew near the shore, he launched a javelin, which stuck in the earth: then, in

com.

<sup>31</sup> Alexander declared general of Greece.

<sup>32</sup> Defeats the Triballi.

<sup>33</sup> The Thebans revolt on the news of his death.

<sup>35</sup> Number of the army with which he invaded Asia.

<sup>36</sup> Sets out on his expedition.



<sup>Macedon.</sup> complete armour, he leaped upon the strand; and, having erected altars to Jupiter, Minerva, and Hercules, he proceeded to Ilium. Here again he sacrificed to Minerva; and taking down some arms which had hung in the temple of that goddess since the time of the Trojan war, consecrated his own in their stead. He sacrificed also to the ghost of Priam, to avert his wrath on account of the descent which he himself claimed from Achilles.

In the mean time the Persians had assembled a great army in Phrygia; among whom was one Memnon a Rhodian, the best officer in the service of Darius. Alexander, as soon as he had performed all the ceremonies which he judged necessary, marched directly towards the enemy. Memnon gave it as his opinion, that they should burn and destroy all the country round, that they might deprive the Greeks of the means of subsisting, and then transport a part of their army into Macedonia. But the Persians, depending on their cavalry, rejected this salutary advice; and posted themselves along the river Granicus, in order to wait the arrival of Alexander. In the engagement which happened on the banks of that river, the Persians were defeated \*, and Alexander became master of all the neighbouring country; which he immediately began to take care of, as if it had been part of his hereditary dominions. The city of Sardis was immediately delivered up; and here Alexander built a temple to Jupiter Olympias. After this, he restored the Ephesians to their liberty; ordered the tribute which they formerly paid to the Persians to be applied towards the rebuilding of the magnificent temple of Diana; and having settled the affairs of the city, marched against Miletus. This place was defended by Memnon with a considerable body of troops who had fled thither after the battle of Granicus, and therefore made a vigorous resistance. The fortune of Alexander, however, prevailed; and the city was soon reduced, though Memnon with part of the troops escaped to Halicarnassus. After this, the king dismissed his fleet, for which various reasons have been assigned; though it is probable, that the chief one was to show his army that their only resource now was in subverting the Persian empire.

Almost all the cities between Miletus and Halicarnassus submitted as soon as they heard that the former was taken; but Halicarnassus, where Memnon commanded with a very numerous garrison, made an obstinate defence. Nothing, however, was able to resist the Macedonian army. Memnon was at last obliged to abandon the place: upon which Alexander took and razed the city of Tralles in Phrygia; received the submission of several princes tributary to the Persians; and having destroyed the Marmarians, a people of Lycia who had fallen upon the rear of his army, put an end to the campaign: after which he sent home all the new-married men; in obedience, it would seem, to a precept of the Mosaic law, and which endeared him more to his soldiers than any other action of his life.

As soon as the season would permit, Alexander quitted the province of Phælium; and having sent part of his army through the mountainous country to Perga, by a short but difficult road, took his route by a certain promontory, where the way is altogether impassable, except when the north winds blow. At the

time of the king's march the south wind had held for long time; but of a sudden it changed, and blew from the north so violently, that, as he and his followers declared, they obtained a safe and easy passage through the divine assistance. By many this march is held to be miraculous, and compared to that of the children of Israel through the Red Sea; while, on the other hand, it is the opinion of others, that there was nothing at all extraordinary in it. He continued his march towards Gordium, a city of Phrygia; the enemy having abandoned the strong pass of Telmidus, through which it was necessary for him to march. When he arrived at Gordium, and finding himself under a necessity of staying some time there till the several corps of his army could be united, he expressed a strong desire of seeing Gordius's chariot, and the famous knot in the harness, of which such strange stories had been published to the world. The cord in which this knot was tied, was made of the inner rind of the cornel-tree; and no eye could perceive where it had begun or ended. Alexander, when he could find no possible way of untying it, and yet was unwilling to leave it tied lest it should cause some fears in the breasts of his soldiers, is said by some authors to have cut the cords with his sword, saying, "It matters not how it is undone." But Aristobolus assures us, that the king wrested a wooden pin out of the beam of the waggon, which, being driven in across the beam, held it up; and so took the yoke from under it. Be this as it will, however, Arrian informs us, that a great tempest of thunder, lightning, and rain, happening the succeeding night, it was held declarative of the true solution of this knot, and that Alexander should become lord of Asia.

The king having left Gordium, marched towards Cilicia; where he was attended with his usual good fortune, the Persians abandoning all the strong passes as he advanced. As soon as he entered the province, he received advice that Artabanes, whom Darius had made governor of Tarsus, was about to abandon it, and that the inhabitants were very apprehensive that he intended to plunder them before he withdrew. To prevent this, the king marched incessantly, and arrived just in time to save the city. But his saving it had well nigh cost him his life: for, either through the <sup>39</sup> excessive fatigue of marching, as some say, or, according to others, by his plunging when very hot into the river Cydnus, which, as it runs through thick shades, has its waters excessively cold, he fell into such a distemper as threatened his immediate dissolution. His army lost their spirits immediately; the generals knew not what to do; and his physicians were so much affrighted, that the terror of his death hindered them from using the necessary methods for preserving his life. Philip the Acarnanian alone preserved temper enough to examine the nature of the king's disease; the worst symptom of which was a continual waking, and which he took off by means of a potion, and in a short time the king recovered his usual health.

Soon after Alexander's recovery, he received the agreeable news that Ptolemy and Alexander had defeated the Persian generals, and made great conquests on the Hellespont; a little after that, he met the Persian army at Issus, commanded by Darius himself. A bloody engagement ensued, in which the Persians were de-  
feated

\* See Græcians.

<sup>37</sup> Consequences of his first victory.

<sup>39</sup> Unties the Gordian knot.

<sup>39</sup> His sickness and recovery.

40 Tyre taken and destroyed.

feated with great slaughter, as related under the article *Issus*. The consequences of this victory were very advantageous to the Macedonians. Many governors of provinces and petty princes submitted themselves to the conqueror; and such as did so were treated, not as a newly-conquered people, but as his old hereditary subjects; being neither burthened with soldiers, nor oppressed with tribute. Among the number of those places which, within a short space after the battle of Issus, sent deputies to submit to the conqueror, was the city of Tyre. The king, whose name was Azelmicus, was absent in the Persian fleet; but his son was among the deputies, and was very favourably received by Alexander. The king probably intended to confer particular honours on the city of Tyre; for he acquainted the inhabitants that he would come and sacrifice to the Tyrian Hercules, the patron of their city, to whom they had erected a most magnificent temple. But these people, like most other trading nations, were too suspicious to think of admitting such an enterprising prince with his troops within their walls. They sent therefore their deputies again to him, to inform him, that they were ready to do whatever he should command them; but, as to his coming and sacrificing in their city, they could not consent to that, but were positively determined not to admit a single Macedonian within their gates. Alexander immediately dismissed their deputies in great displeasure. He then assembled a council of war, wherein he insisted strongly on the disaffected state of Greece, (for most of the Grecian states had sent ambassadors to Darius, to enter into a league with him against the Macedonians,) the power of the Persians by sea, and the folly of carrying on the war in distant provinces, while Tyre was left unredressed behind them: he also remarked, that if once this city was subdued, the sovereignty of the sea would be transferred to them, because it would fix their possession of the coasts; and as the Persian fleet was composed chiefly of tributary squadrons, those tributaries would fight the battles, not of their late, but of their present masters. For these reasons the siege of Tyre was resolved on. The town was not taken, however, without great difficulty; which provoked Alexander to such a degree, that he treated the inhabitants with the greatest cruelty. See *TYRE*.

After the reduction of Tyre, Alexander, though the season was already far advanced, resolved to make an expedition into Syria; and in his way thither proposed to chastise the Jews, who had highly offended him during the siege of Tyre: for when he sent to them to demand provisions for his soldiers, they answered, that they were the subjects of Darius, and bound by oath not to supply his enemies. The king, however, was pacified by their submission; and not only pardoned them, but conferred many privileges upon them, as related under the article *Jews*.

41 Egypt submitted.

From Jerusalem Alexander marched directly to Gaza, the only place in that part of the world which still held out for Darius. This was a very large and strong city, situated on an high hill, about five miles from the sea shore. One *Batis*, or *Betis*, an eunuch, had the government of the place; and had made every preparation necessary for sustaining a long and obstinate siege. The governor defended the place

with great valour, and several times repulsed his enemies: but at last it was taken by storm, and all the garrison slain to a man; and this secured to Alexander an entrance into Egypt, which having before been very impatient of the Persian yoke, admitted the Macedonians peaceably.

42 Alexander visits the temple of Jupiter Ammon.

Here the king laid the foundations of the city of Alexandria, which for many years after continued to be the capital of the country. While he remained here, he also formed the extraordinary design of visiting the temple of Jupiter Ammon. As to the motives by which he was induced to take this extraordinary journey, authors are not agreed; but certain it is, that he hazarded himself and his troops in the highest degree; there being two dangers in this march, which, with the example of Cambyfes, who lost the greatest part of his army in it, might have terrified any body but Alexander. The first was the want of water, which, in the sandy deserts surrounding the temple, is no where to be found: the other, the uncertainty of the road from the fluctuation of the sands; which, changing their situation every moment, leave the traveller neither a road to walk in, nor mark to march by. These difficulties, however, Alexander got over; though not without a miraculous interpolation, as is pretended by all his historians.

Alexander having consulted the oracle, and received a favourable answer, returned to pursue his conquests. Having settled the government of Egypt, he appointed the general rendezvous of his forces at Tyre. Here he met with ambassadors from Athens, requesting him to pardon such of their countrymen as he found serving the enemy. The king, being desirous to oblige such a famous state, granted their request; and sent also a fleet to the coast of Greece, to prevent the effects of some commotions which had lately happened in Peloponnesus. He then directed his march to Thapfacus; and having passed the Euphrates and Tigris, met with Darius near Arbela, where the Persians were again overthrown with prodigious slaughter\*, and Alexander in effect became master of the Persian empire.

\* See *Arbela*.

43 Reduces Babylon, Susa, and Persopolis.

After this important victory, Alexander marched directly to Babylon, which was immediately delivered up; the inhabitants being greatly disaffected to the Persian interest. After 30 days stay in this country, the king marched to Susa, which had already surrendered to Philoxenus; and here he received the treasures of the Persian monarch, amounting, according to the most generally received account, to 50,000 talents. Having received also at this time a supply of 6000 foot and 500 horse from Macedon, he set about reducing the nations of Media, among whom Darius was retired. He first reduced the Uxians; and having forced a passage to Persopolis the capital of the empire, he like a barbarian destroyed the stately palace there, a pile of building not to be equalled in any part of the world; after having given up the city to be plundered by his soldiers. In the palace he found 120,000 talents, which he appropriated to his own use, and caused immediately to be carried away upon mules and camels; for he had such an extreme aversion to the inhabitants of Persopolis, that he determined to leave nothing valuable in the city.

During the time that Alexander remained at Persopolis

Macedon. fepolis, he received intelligence that Darius remained at Ecbatana the capital of Media; upon which he pursued him with the greatest expedition, marching at the rate of near 40 miles a-day. In 15 days he reached Ecbatana, where he was informed that Darius had retired from thence five days before, with an intent to pass into the remotest provinces of his empire. This put some stop to the rapid progress of the Macedonian army; and the king perceiving that there was no necessity for hurrying himself and his soldiers in such a manner, began to give the orders requisite in the present situation of his affairs. The Theffalian horse, who had deserved exceedingly well of him in all his battles, he dismissed according to his agreement; gave them their whole pay, and ordered 2000 talents over and above to be distributed among them. He then declared that he would force no man; but if any were willing to serve him longer for pay, he desired they would enter their names in a book, which a great many of them did; the rest fold their horses, and prepared for their departure. The king appointed Epocillus to conduct them to the sea, and assigned him a body of horse as an escort: he likewise sent Menetes with them, to take care of their embarkation, and that they were safely landed in Euboea without any expence to themselves.

On receiving fresh information concerning the state of Darius's affairs, the king set out again in pursuit of him, advancing as far as Rhages, a city one day's journey from the Caspian straits: there he understood that Darius had passed those straits some time before; which information leaving him again without hopes, he halted for five days. Oxidates, a Persian whom Darius had left prisoner at Sufa, was made governor of Media, while the king departed on an expedition into Parthia. The Caspian straits he passed immediately, without opposition; and then gave directions to his officers to collect a quantity of provisions sufficient to serve his army on a long march through a wasted country. But before his officers could accomplish those commands, the king received intelligence that Darius had been murdered by Bessus, one of his own subjects, and governor of Bactria, as is related at length under the article PERSIA.

As soon as Alexander had collected his forces together, and settled the government of Parthia, he entered Hyrcania; and having, according to his usual custom, committed the greatest part of his army to the care of Craterus, he, at the head of a choice body of troops, passed through certain craggy roads, and before the arrival of Craterus, who took an open and easy path, struck the whole provinces with such terror, that all the principal places were immediately put into his hands, and soon after the province of Aria also submitted, and the king continued Satibarzanes the governor in his employment.—The reduction of this province finished the conquest of Persia; but the ambition of Alexander to become master of every nation of which he had the least intelligence, induced him to enter the country of the *Mardi*, merely because its rocks and barrenness had hitherto hindered any body from conquering, or indeed from attempting to conquer it. This conquest, however, he easily accomplished, and obliged the whole nation to submit to his pleasure. But in the meantime disturbances

began to arise in Alexander's new empire, and among his troops, which all his activity could not thoroughly suppress. He he scarcely left the province of Aria, when he received intelligence, that the traitor Bessus had caused himself to be proclaimed king of Asia by the name of *Artaxerxes*; and that Satibarzanes had joined him, after having massacred all the Macedonians who had been left in the province. Alexander appointed one *Arsanes*, governor in the room of Satibarzanes; and marched thence with his army against the *Zaranga*, who under the command of Barzaentes, one of those who had conspired against Darius, had taken up arms, and threatened to make an obstinate defence. But, their numbers daily falling off, Barzaentes being afraid they would purchase their own safety at the expence of his, privately withdrew from his camp, and, crossing the river Indus, fought shelter among the nations beyond it. But they, either dreading the power of Alexander, or detesting the treachery of this Persian towards his former master, seized and delivered him up to Alexander, who caused him immediately to be put to death.

The immense treasure which the Macedonians had acquired in the conquest of Persia began now to corrupt them. The king himself was of a most generous disposition, and liberally bestowed his gifts on those around him; but they made a bad use of his bounty, and foolishly indulged those vices by which the former possessors of that wealth had lost it. The king did all in his power to discourage the lazy and inactive pride which now began to shew itself among his officers; but neither his discourses nor his example had any considerable effect. The manners of his courtiers from bad became worse, in spite of all he could say or do to prevent it; and at last they proceeded to censure his conduct, and to express themselves with some bitterness on the subject of his long continuance of the war, and his leading them constantly from one labour to another. This came to such an height, that the king was at last obliged to use some severity in order to keep his army within the limits of their duty.

From this time forward, however, Alexander himself began to alter his conduct; and by giving a little in to the customs of the Orientals, endeavoured to secure that obedience from his new subjects which he found so difficult to be preserved among his old ones. He likewise endeavoured, by various methods, to blend the customs of the Asiatics and the Greeks. The form of his civil government resembled that of the ancient Persian kings; in the military affairs, however, he preserved the Macedonian discipline; but then he made choice of 30,000 boys out of the provinces, whom he caused to be instructed in the Greek language, and directed to be brought up in such a manner as that from time to time he might with them fill up the phalanx. The Macedonians saw with great concern these extraordinary measures which suited very ill with their gross understandings; for they thought, after all the victories they had gained, to be absolute lords of Asia, and to possess not only the riches of its inhabitants, but to rule the inhabitants themselves: whereas they now saw, that Alexander meant no such thing; but that, on the contrary, he conferred governments, offices at court, and all other marks of confidence and favour, indis-

44  
He pursues  
Darius.

45  
Who is  
murdered.

46  
Alexander  
reduces  
Hyrcania.

47  
The Macedonians  
give themselves  
up to luxury.

48  
Alexander  
conforms to  
the Persian  
customs.

cri-



Macedon.

Macedon.

criminally both on Greeks and Persians.—From this time also the king seems to have given instances of a cruelty he had never shown before. Philotas his most intimate friend was seized, tortured, and put to death for a conspiracy of which it could never be proven that he was guilty; and soon after Parmenio and some others were executed without any crime at all real or alleged. These things very much disturbed the army. Some of them wrote home to Macedonia of the king's suspicions of his friends, and his disposition to hunt out enemies at the very extremities of the world. Alexander having intercepted some of these letters, and procured the best information he could concerning their authors, picked out these dissatisfied people, and having disposed them into one corps, gave it the title of the *turbulent battalion*; hoping by this means to prevent the spirit of disaffection from pervading the whole army.

As a farther precaution against any future conspiracy, Alexander thought fit to appoint Hephæstion and Clytus generals of the auxiliary horse; being apprehensive, that if this authority was lodged in the hands of a single person, it might prompt him to dangerous undertakings, and at the same time furnish him with the means of carrying them into execution. To keep his forces in action, he suddenly marched into the country of the Euergetæ, i. e. *Benefactors*; and found them full of that kind and hospitable disposition, for which that name had been bestowed on their ancestors: he therefore treated them with great respect; and, at his departure added some lands to their dominions, which lay contiguous, and which for that reason they had requested of him.

Turning then to the east, he entered Arachosia, the inhabitants of which submitted without giving him any trouble. While he passed the winter in these parts, the king received advice, that the Arians, whom he had so lately subdued, were again up in arms, Satibarzanes being returned into that country with two thousand horse assigned him by Bessus. Alexander instantly dispatched Artabazus the Persian, with Erigyus and Caranus, two of his commanders, with a considerable body of horse and foot: he likewise ordered Phrataphernes, to whom he had given the government of Parthia, to accompany them. A general engagement ensued, wherein the Arians behaved very well, as long as their commander Satibarzanes lived: but he engaging Erigyus, the Macedonian struck him first into the throat, and then, drawing forth his spear again, through the mouth; so that he immediately expired, and with him the courage of his soldiers, who instantly begun to fly; whereupon Alexander's commanders made an easy conquest of the rest of the country, and settled it effectually under his obedience.

The king, notwithstanding the inclemency of the season, advanced into the country of Paropamisus, so called from the mountain Paropamisus, which the soldiers of Alexander called *Caucasus*. Having crossed the country in 16 days, he came at length to an opening leading into Media; which finding of a sufficient breadth, he directed a city to be built there, which he called *Alexandria*, as also several other towns about a day's journey distant from thence: and in these places he left 7000 persons, part of them such

as had hitherto followed his camp, and part of the mercenary soldiers, who, weary of continual fatigue, were content to dwell there. Having thus settled things in this province, sacrificed solemnly to the gods, and appointed Proxenes the Persian president thereof, with a small body of troops under the command of Niloxenus to assist him, he resumed his former design of penetrating into Bactria.

Bessus, who had assumed the title of *Artaxerxes*, when he was assured that Alexander was marching towards him, immediately began to waste all the country between Paropamisus and the river Oxus; which river he passed with his forces, and then burnt all the vessels he had made use of for transporting them, retiring to Nautaca a city of Sogdia; fully persuaded, that, by the precautions he had taken, Alexander would be compelled to give over his pursuit. This conduct of his, however, disheartened his troops, and gave the lie to all his pretensions; for he had affected to censure Darius's conduct, and had charged him with cowardice, in not defending the rivers Euphrates and Tigris, whereas he now quitted the banks of the most defensible river perhaps in the whole world. As to his hopes, tho' it cannot be said they were ill founded, yet they proved absolutely vain; for Alexander, continuing his march, notwithstanding all the hardships his soldiers sustained, reduced all Bactria under his obedience, particularly the capital Bactria and the strong castle Aornus: in the latter he placed a garrison under the command of Archelaus; but the government of the province he committed to Artabazus. He then continued his march to the river Oxus: on the banks of which, when he arrived, he found it three quarters of a mile over, its depth more than proportionable to its breadth, its bottom sandy, its stream so rapid as to render it almost unnavigable, and neither boat nor tree in its neighbourhood; so that the ablest commanders in the Macedonian army were of opinion that they should be obliged to march back. The king, however, having first sent away, under a proper escort, all his infirm and worn-out soldiers, that they might be conducted safe to the sea-ports, and from thence to Greece, devised a method of passing this river without either boat or bridge, by causing the hides which covered the soldiers' tents and carriages to be stuffed with straw, and then tied together and thrown into the river. Having crossed the Oxus, he marched directly towards the camp of Bessus, where, when he arrived, he found it abandoned; but received at the same time letters from Spitamenes and Dataphernes, who were the chief commanders under Bessus, signifying, that, if he would send a small party to receive Bessus, they would deliver him into his hands; which they did accordingly, and the traitor was put to death in the manner related in the history of PERSIA.

A supply of horses being now arrived, the Macedonian cavalry were remounted. Alexander continued his march to Maracanda the capital of Sogdia, from whence he advanced to the river Iaxartes. Here he performed great exploits against the Scythians; from whom, however, tho' he overcame them, his army suffered much; and the revolted Sogdians being headed by Spitamenes, gave him a great deal of trouble. Here he married Roxana the daughter of Oxyartes, a prince of the country whom he had subdued. But du-

<sup>50</sup> Bessus reduced and put to death.

<sup>51</sup> Alexander marries Roxana.

<sup>49</sup> Satibarzanes defeated and killed.

ring these expeditions, the king greatly disgusted his army by the murder of his friend Clytus in a drunken quarrel at a banquet, and by his extravagant vanity in claiming divine honours.

At last he arrived at the river Indus, where Hephæstion and Perdicas had already provided a bridge of boats for the passage of the army. The king refreshed his troops for 30 days in the countries on the other side of the river, which were those of his friend and ally Taxiles, who gave him 30 elephants, and joined his army now with 700 Indian horse, to which, when they were to enter upon action, he afterwards added 5000 foot. The true reason of this seems to have been his enmity to Porus, a famous Indian prince, whose territories lay on the other side of the river Hydaspes. During this recess, the king sacrificed with great solemnity; receiving also ambassadors from Ambilurus a very potent prince, and from Doxareas, who was likewise a king in those parts, with tenders of their duty, and considerable presents. These ceremonies over, Alexander appointed Philip governor of Taxila, and put a Macedonian garrison into the place, because he intended to erect an hospital there for the cure of his sick and wounded soldiers. He then ordered the vessels, of which his bridge had been composed when he passed the Indus, to be taken to pieces, that they might be brought to the Hydaspes, where he was informed that Porus with a great army lay encamped to hinder his passage. When he approached the banks of this river with his army and the auxiliaries under the command of Taxiles, he found that the people he had to do with were not so easily to be subdued as the Persians and other Asiatics. The Indians were not only a very tall and robust, but also a very hardy and well-disciplined people; and their king Porus, was a prince of high spirit, invincible courage, and great conduct.

It was about the summer-solstice when Alexander reached the Hydaspes, and consequently its waters were broader, deeper, and more rapid, than at any other time; for in India the rivers swell as the sun's increasing heat melts the snow, and subside again as winter approaches. Alexander therefore had every difficulty to struggle with. Porus had made his dispositions so judiciously, that Alexander found it impossible to practise upon him as he had done upon others, and to pass the river in his view: wherefore he was constrained to divide his army into small parties, and to practise other arts, in order to get the better of so vigilant a prince. To this end he caused a great quantity of corn and other provisions to be brought into his camp; giving out, that he intended to remain where he was till the river fell, and by becoming fordable should give him an opportunity of forcing a passage: this did not, however, hinder Porus from keeping up very strict discipline in his camp; which when Alexander perceived, he frequently made such motions as seemed to indicate a change of his resolution, and that he had still thoughts of passing the river. The main thing the Macedonians stood in fear of were the elephants; for the bank being pretty steep on the other side, and it being the nature of horses to start at the first appearance of those animals, it was foreseen that the army would be disordered, and incapable of sustaining the charge of Porus's troops.

At length Alexander passed the river by the fol-

lowing contrivance. There was, at the distance of 150 stadia from his camp, a rocky promontory projecting into the river, thick covered with wood; and over-against this promontory there lay a pretty large uninhabited island almost overgrown with trees. The king therefore conceived within himself a project of conveying a body of troops from this promontory into that island; and upon this scheme he built his hopes of surprising Porus, vigilant as he was. To this end he kept him and his army constantly alarmed for many nights together, till he perceived that Porus apprehended it was only done to harass his troops, and therefore no longer drew out of his camp, but trusted to his ordinary guards: then Alexander resolved to put his design in execution. A considerable body of horse, the Macedonian phalanx, with some corps of light-armed foot, he left in his camp under the command of Craterus, as also the auxiliary Indians: giving these orders to be observed in his absence, that if Porus marched against him with part of his army and left another part with the elephants behind in his camp, Craterus and his forces should remain where they were; but if it so happened that Porus withdrew his elephants, then Craterus was to pass the river, because his cavalry might then do it safely. Alexander having marched half the way, or about nine of our miles, ordered the mercenary troops under the command of Attalus and other generals, to remain there; and directed them, that as soon as they knew he was engaged with the Indians on the other side, they should pass in vessels provided for that purpose, in order to assist him. Then marching a long way about, that the enemy might not perceive his design of reaching the rock, he advanced as diligently as he could towards that post. It happened very fortunately for him, that a great storm of thunder, lightning, and hail, rose in the night, whereby his march was perfectly concealed, his vessels of 30 oars put together, and his tents stuffed and stitched, so that they passed from the rock into the island, without being perceived, a little before break of day; the storm ceasing just as he and his soldiers were ready for their passage. When they had traversed the island, they boldly set forward to gain the opposite shore in sight of Porus's out-guards, who instantly posted away to give their master an account of the attempt. Alexander landed first himself, and was followed as expeditiously as possible by his forces, whom he took care to draw up as fast as they arrived. When they began their march again, they found that their good fortune was not so great as at first they esteemed it; for it appeared now, that they had not reached the continent at all, but were in truth in another island much larger than the former. They crossed it as fast as they could, and found that it was divided from the *terra firma* by a narrow channel, which, however, was so swelled by the late heavy rain, that the poor soldiers were obliged to wade up to the breast. When they were on the other side, the king drew them up again carefully, ordering the foot to march slowly, they being in number about 6000, while himself with 5000 horse advanced before. As soon as Porus received intelligence that Alexander was actually passing the river, he sent his son with 2000 horse, and 120 armed chariots, to oppose him. But they came too late: Alexander was already got on shore, and even on his march.

When

Macedon.  
25  
Passes the  
Indus.

Macedon.  
53  
And the  
Hydaspes  
with diffi-  
culty.

Macedon.

Macedon.

55  
The son of  
Porus de-  
feated and  
killed.

When the Macedonian scouts perceived them advance, they informed the king, who sent a detachment to attack them, remaining still at the head of his cavalry in expectation of Porus. But when he found that this party was unsupported, he instantly attacked with all his horse, and defeated them with the slaughter of many, and the loss of all their armed chariots, the son of Porus being slain in the fight. The remainder of the horse returning to the camp with this disastrous account, Porus was in some confusion: however, he took very quickly the best and wisest resolutions his circumstances would allow; which were, to leave a part of his army, with some of his elephants, to oppose Craterus, who was now about to pass the river also; and, with the rest, to march against Alexander and his forces, who were already passed. This resolution once taken, he marched immediately out of his camp, at the head of 4000 horse, 30,000 foot, 300 chariots, and 200 elephants. He advanced as expeditiously as he could, till he came into a plain which was firm and sandy, where his chariots and elephants might act to advantage: there he halted, that he might put his army in order, knowing well that he need not go in quest of his enemy. Alexander soon came up with his horse, but he did not charge Porus; on the contrary, he halted, and put his troops in order, that they might be able to defend themselves in case they were attacked. When he had waited some time, his foot arrived; whom he immediately surrounded with his horse, that, after so fatiguing a march, they might have time to cool and breathe themselves, before they were led to engage. Porus permitted all this, because it was not his interest to fight, and because he depended chiefly upon his order of battle, the elephants covering his foot, so that the Macedonians could not charge them.

55  
Porus him-  
self defeat-  
ed.

When Alexander had disposed his foot in proper order, he placed his horse on the wings; and, observing that he was much superior in them to the enemy, and that the cavalry of Porus were easy to be charged, he resolved to let the foot have as little share as possible in the battle. To this end, having given the necessary directions to Cœnus who commanded them, he went himself to the right, and with great fury fell upon the left wing of Porus. The dispute, tho' short, was very bloody: the cavalry of Porus, tho' they fought gallantly, were quickly broken; and the foot being by this means uncovered, the Macedonians charged them. But the Indian horse rallying, came up to their relief, yet were again defeated. By this time the archers had wounded many of the elephants, and killed most of their riders, so that they did not prove less troublesome and dangerous to their own side than to the Macedonians; whence a great confusion ensued, and Cœnus, taking this opportunity, fell in with the troops under his command, and entirely defeated the Indian army. Porus himself behaved with the greatest intrepidity, and with the most excellent conduct: he gave his orders, and directed every thing, as long as his troops retained their form; and, when they were broken, he retired from party to party as they made stands, and continued fighting till every corps of Indians was put to the rout. In the mean time Craterus had passed with the rest of the Macedonian army; and these, falling upon the flying Indians, increased the slaughter

of the day excessively, inasmuch that 20,000 foot and 3000 horse were killed, all the chariots were hacked to pieces, and the elephants not killed were taken: two of Porus's sons fell here, as also most of his officers of all ranks.

As for Porus, Alexander gave strict directions that no injury might be done to his person: he even sent Taxiles to persuade him to surrender himself, and to assure him that he should be treated with all the kindness and respect imaginable; but Porus, disclaiming this advice from the mouth of an old enemy, threw a javelin at him, and had killed him, but for the quick turn of his horse. Meroë the Indian, who was also in the service of Alexander, succeeded better: he had been the old acquaintance of Porus; and therefore, when he intreated that prince to spare his person, and to submit himself to fortune and a generous victor, Porus followed his advice; and we may truly say, that the condition of this Indian king suffered nothing by the loss of the battle. Alexander immediately gave him his liberty, restored him shortly after to his kingdom, to which he annexed provinces almost equal to it in value. Neither was Alexander a loser by his munificence; for Porus remained his true friend and constant ally.

56  
He submits  
to Alexander.

To perpetuate the memory of this victory, Alexander ordered two cities to be erected; one on the field of battle, which he named *Nicca*; the other on this side the river, which he called *Bucephala*, in honour of his horse Bucephalus, who died here, as Arrian says, of mere old age, being on the verge of 30. All the soldiers, who fell in battle, he buried with great honours; offered solemn sacrifices to the gods, and exhibited pompous shows on the banks of the Hydaspes, where he had forced his passage. He then entered the territories of the Gause, in which were 37 good cities, and a multitude of populous villages. All these were delivered up to him without fighting; and as soon as he received them, he presented them to Porus; and having reconciled him to Taxiles, he sent the latter home to his own dominions. About this time ambassadors arrived from some Indian princes with their submissions; and Alexander, having conquered the dominions of another Porus, which lay on the Hydraotes a branch of the Indus, added them to those of Porus his ally.

In the middle of all this success, however, news arrived, that the Cathi, the Oxysdrace, and the Malli, the most warlike nations of India, were confederated against the Macedonians, and had drawn together a great army. The king immediately marched to give them battle; and in a few days reached a city called *Sangala*, seated on the top of an hill, and having a fine lake behind it. Before this city the confederate Indians lay encamped, having three circular lines of carriages locked together, and their tents pitched in the centre. Notwithstanding the apparent difficulty of forcing these intrenchments, Alexander resolved immediately to attack them. The Indians made a noble defence; but at last the first line of their carriages was broken, and the Macedonians entered. The second was stronger by far; yet Alexander attacked that too, and, after a desperate resistance, forced it. The Indians, without trusting to the third, retired into the city; which Alexander would have invetted: but the

57  
Sangala ta-

foot



Macedon. foot he had with him not being sufficient for that purpose, he caused his works to be carried on both sides as far as the lake; and, on the other side of that, ordered several brigades of horse to take post; ordering also battering engines to be brought up, and in some places employing miners. The second night, he received intelligence that the besieged, knowing the lake to be fordable, intended to make their escape through it. Upon this the king ordered all the carriages which had been taken in forcing their camp to be placed up and down the roads, in hopes of hindering their flight; giving directions to Ptolemy, who commanded the horse on the other side of the lake, to be extremely vigilant, and to cause all his trumpets to sound, that the forces might repair to that post where the Indians made their greatest effort. These precautions had all the effect that could be desired: for of the few Indians who got through the lake, and passed the Macedonian horse, the greater part were killed on the roads; but the greatest part of their army was constrained to retire again through the water into the city. Two days after, the place was taken by storm. Seventeen thousand Indians were killed; 70,000 taken prisoners; with 300 chariots, and 500 horse. The Macedonians are said to have lost only 100 men in this siege; but they had 1200 wounded, and among these several persons of great distinction.

The city was no sooner taken, than Alexander dispatched Eumenes his secretary, with a party of horse, to acquaint the inhabitants of the cities adjacent with what had befallen the Sangalans; promising also, that they should be kindly treated if they would submit. But they were so much affrighted at what had happened to their neighbours, that, abandoning all their cities, they fled into the mountains; choosing rather to expose themselves to wild beasts, than to these invaders, who had treated their countrymen so cruelly. When the king was informed of this, he sent detachments of horse and foot to scour the roads; and these, finding aged, infirm, and wounded people, to the number of about 500, put them to the sword without mercy. Perceiving that it was impossible to persuade the inhabitants to return, he caused the city of Sangala to be razed, and gave the territories to the few Indians who had submitted to him.

Alexander, still unsated with conquest, now prepared to pass the Hyphasis. The chief reason which induced him to think of this expedition was, the information he had received of the state of the countries beyond that river. He was told that they were in themselves rich and fruitful; that their inhabitants were not only a very martial people, but very civilized; that they were governed by the nobility, who were themselves subject to the laws; and that, as they lived in happiness and freedom, it was likely they would fight obstinately in defence of those blessings. He was farther told, that, among these nations there were the largest, strongest, and most useful elephants bred and tamed; and was therefore fired with an earnest desire to reduce such a bold and brave people under his rule, and of attaining to the possession of the many valuable things that were said to be amongst them. As exorbitant, however, as his personal ambition was, he found it impossible to infuse any part of it into the

minds of his soldiers; who were so far from wishing to triumph over new and remote countries, that they were highly desirous of leaving those that they had already conquered. When therefore they were informed of the king's intentions, they privately consulted together in the camp about the situation of their own affairs. At this consultation, the gravell and best of the soldiers lamented that they were made use of by their king, not as lions, who fall fiercely upon those who have injured them; but as maffiffs, who fly upon and tear those who are pointed out to them as enemies. The rest were not so modest; but expressed themselves roundly against the king's humour for leading them from battle to battle, from siege to siege, and from river to river; protesting that they would follow him no further, nor lavish away their lives any longer, to purchase fame for him.

Alexander was a man of too much penetration not to be early in perceiving that his troops were very uneasy. He therefore harangued them from his tribunal; but though his eloquence was great, and the love his army had for him was yet very strong, they did not relent. For some time the soldiers remained fullen and silent; and at last turned their eyes on Cœnus, an old and experienced general, whom Alexander loved, and in whom the army put great confidence.—He had the generosity to undertake their cause; and told Alexander frankly, “that men endured toil in hopes of repose; that the Macedonians were already much reduced in their numbers; that of those who remained, the greater part were invalids; and that they expected, in consideration of their former services, that he would now lead them back to their native country: an act, which, of all others, would most contribute to his own great designs; since it would encourage the youth of Macedonia, and even of all Greece, to follow him in whatever new expedition he pleased to undertake.” The king was far from being pleased with this speech of Cœnus, and much less with the disposition of his army, which continued in a deep silence. He therefore dismissed the assembly: but next day he called another, wherein he told the soldiers plainly, that he would not be driven from his purpose; that he would proceed in his conquests with such as should follow him voluntarily: as for the rest, he would not detain them, but would leave them at liberty to go home to Macedon, where they might publish, “that they had left their king in the midst of his enemies.” Even this expedient had no success; his army was so thoroughly tired with long marches and desperate battles, that they were determined to go no further, either for fair speeches or foul. Upon this Alexander retired to his tent, where he refused to see his friends, and put on the same gloomy temper that reigned among his troops. For three days, things remained in this situation. At last the king suddenly appeared; and, as if he had been fully determined to pursue his first design, he gave orders for sacrificing for the good success of his new undertaking. Aristander the augur reported, that the omens were altogether inauspicious; upon which the king said, that since his proceeding farther was neither pleasing to the gods, nor grateful to his army, he would return. When this was rumoured among the army, they assembled

Macedon.

59  
Alexander's troops  
refuse to proceed  
further.

58

And razed.

60  
He consents  
they all to return.

sembled

Macedon. assembled in great numbers from the royal tent, saluting the king with loud acclamations, wishing him success in all his future designs; giving him, at the same time, hearty thanks, for that "he who was invincible had suffered himself to be overcome by their prayers."

61  
Sails down  
the Indus.

A stop being thus put to the conquests of Alexander, he determined to make the Hyphasis the boundary of his dominions; and having erected twelve altars of an extraordinary magnitude, he sacrificed on them: after which he exhibited shows in the Grecian manner; and, having added all the conquered country in these parts to the dominions of Porus, he began to return. Having arrived at the Hydaspes, he made the necessary preparations for sailing down the Indus into the ocean. For this purpose, he ordered vast quantities of timber to be felled in the neighbourhood of the Hydaspes, through which he was to fall into the Indus; he caused the vessels with which he had passed other rivers to be brought thither, and assembled a vast number of artificers capable of repairing and equipping his fleet; which, when finished, consisted of 80 vessels of three banks of oars, and 2000 lesser ships and transports. Those who were to manage this fleet were collected out from the Phœnicians, Cyprians, Carians, and Egyptians following his army, and who were reckoned perfectly well skilled in the naval art. When all things were ready, the army embarked about break of day; the king, in the mean time, sacrificing to the gods according to the ceremonies used in his own country, and likewise according to those of the country where he now was. Then he himself went on board; and causing the signal to be given by sound of trumpet, the fleet set sail. Craterus and Hephaestion had marched some days before with another division of the army; and in three days the fleet reached that part of the river which was opposite to their camps. Here he had information, that the Oxydracæ and Malli were raising forces to oppose him: upon which he immediately determined to reduce them; for, during this voyage, he made it a rule to compel the inhabitants on both sides of the river to yield him obedience. But before he arrived on the coasts of the people abovementioned, he himself sustained no small danger; for, coming to the confluence of the Acesines with the Hydaspes, from whence both rivers roll together into the Indus, the eddies, whirlpools, and rapid currents, rushing with tremendous noise from the respective channels of those rivers into the great one formed by them both, at once terrified those who navigated his vessels, and actually destroyed many of the long vessels, with all who were aboard of them; the king himself being in some danger, and Nearchus the admiral not a little at a loss. As soon as this danger was over, Alexander went on shore; and having ordered his elephants with some troops of horse and archers to be carried across, and put under the command of Craterus, he then divided his army on the left-hand bank into three bodies; the first commanded by himself, the second by Hephaestion, and the third by Ptolemy. Hephaestion had orders to move silently through the heart of the country, five days march before the king; that if, on Alexander's approach, any of the barbarians should attempt to shelter themselves by retiring into the

country, they might fall into the hands of Hephaestion. Ptolemy Lagus was ordered to march three days journey behind the king, that if any escaped his army, they might fall into Ptolemy's hands; and the fleet had orders to stop at the confluence of this river with the Hydaroates, till such time as these several corps should arrive.

62  
His expedition  
against  
the Malli.

Alexander himself, at the head of a body of horse and light-armed foot, marched through a desert country against the Malli; and, scarce affording any rest to his soldiers, arrived in three days at a city into which the barbarians had put their wives and children, with a good garrison for their defence. The country people, having no notion that Alexander would march through such a desert and barren region, were all unarmed, and in the utmost confusion. Many of them therefore were slain in the field; the rest fled into the city, and shut the gates. But this only protracted their fate for a short time; for the king, having ordered the city to be invested by his cavalry, took it, as well as the castle, by storm, and put all he found there to the sword. He sent at the same time Perdiccas with a considerable detachment, to invest another city of the Malli at a considerable distance; but when he came there, he found it abandoned. However, he pursued the inhabitants who had but lately left it, and killed great numbers of them on the road. After this the king took several other cities, but not without considerable resistance; for the Indians sometimes chose to burn themselves in their houses rather than surrender. At last he marched to their capital city; and finding that abandoned, he proceeded to the river Hydaroates, where he found 50,000 men encamped on the opposite bank, in order to dispute his passage. He did not hesitate, however, to enter the river with a considerable party of horse, and so much were the Indians terrified at his presence, that their whole army retired before him. In a short time they returned and attacked him, being ashamed to fly before such an inconsiderable number; but in the mean time the rest of the Macedonian forces came up, and the Indians were obliged to retire to a city which lay behind them, and which Alexander invested that very night. The next day he stormed the city with such violence, that the inhabitants were compelled to abandon it, and to retire to the castle, where they prepared for an obstinate defence. The king instantly gave orders for scaling the walls, and the soldiers prepared to execute these orders as fast as they could; but the king being impatient, caught hold of a ladder and mounted it first himself, being followed by Leonatus, Peucestas, and Abreas, the latter a man of great valour, and who on that account had double pay allowed him. The king having gained the top of the battlements, cleared them quickly of the defenders, killing some of them with his sword, and pushing others over the walls: but after this was done, he was in more danger than ever; for the Indians galled him with their arrows from the adjacent towers, though they durst not come near enough to engage him. His own battalion of targeteers mounting in haste to second him, broke the ladders; which, as soon as Alexander perceived, he threw himself down into the castle, as did also Peucestas, Leonatus, and Abreas. As soon as the king was on the ground, the

63  
His desperate  
valour  
and danger.

the Indian general rushed forward to attack him; but Alexander instantly dispatched him, as well as several others who followed him. Upon this the rest retired, and contented themselves with throwing darts and stones at him at a distance. Abreas was struck into the head with an arrow, and died on the spot; and, shortly after, another pierced through the king's breast-plate into his body. As long as he had spirits, he defended himself valiantly; but, through a vast effusion of blood, losing his senses, he fell upon his shield. Peucestas then covered him with the sacred shield of Pallas on one side, as did Leonatus with his own shield on the other, though they themselves were dreadfully wounded. In the mean time, however, the soldiers on the outside, eager to save their king, supplied their want of ladders by driving large iron pins into the walls. By the help of these many of them ascended, and came to the assistance of Alexander and his companions. The Indians were now slaughtered without mercy; but Alexander continued for some time in a very dangerous way: however, he at last recovered his strength, and shewed himself again to his army, which filled them with the greatest joy.

The Malli, being now convinced that nothing but submission could save the remainder of them, sent deputies to Alexander, offering him the dominion of their country; as did also the Oxydræ: and the king having settled every thing in these countries agreeable to his mind, proceeded on his voyage down the river Indus. In this voyage he received the submission of some other Indian princes; and perceiving, that, at the point of island Pattala, the river divided itself into two vast branches, he ordered an haven and convenient docks to be made there for his ships; and when he had careened his fleet, he sailed down the right-hand branch towards the ocean. In his passage he sustained great difficulties by reason of his want of pilots, and at the mouth of the river very narrowly missed being cast away: yet all this did not hinder him from pursuing his first design, though it does not appear that he had any other motive thereto than the vain desire of boasting that he had entered the ocean beyond the Indus: for, having consecrated certain bulls to Neptune, and thrown them into the sea, performed certain libations of golden cups, and thrown the cups also into the sea, he came back again; having only surveyed two little islands, one at the mouth of the Indus, and one a little farther in the ocean.

On the king's return to Pattala, he resolved to sail down the other branch of the Indus, that he might see whether it was more safe and commodious for his fleet than that which he had already tried; and for this he had very good reasons. He had resolved to send Nearchus with his fleet by sea, through the Persian gulf up the river Tygris, to meet him and his army in Mesopotamia; but as the possibility of this voyage depended on the ceasing of the Etesian winds, there was a necessity of laying up the fleet till the season should prove favourable. Alexander, therefore, sailing through this branch of the Indus, fought on the sea-coast for bays and creeks, where his fleet might anchor in safety; he caused also pits to be sunk, which might be filled with fresh water for the use of his people; and took all imaginable precautions

for preserving them in care and safety till the season would allow them to continue their voyage. In this he succeeded to his wish; for he found this branch of the river Indus, at its mouth, spread over the plain country and forming a kind of lake, wherein a fleet might ride with safety. He therefore appointed Leonatus, and a part of his army, to carry on such works as were necessary; causing them to be relieved by fresh troops as often as there was occasion: then having given his last instructions to Nearchus, he departed with the rest of the army, in order to march back to Babylon.

Before the king's departure, many of his friends advised him against the route which he intended to take. They told him, that nothing could be more rash or dangerous than this resolution. They acquainted him, that the country, thro' which he was to travel, was a wild uncultivated desert; that Semiramis, when she led her soldiers this way out of India, brought home but 20 of them; and that Cyrus, attempting to do the same, returned with only seven. But all this was so far from deterring Alexander, that it more than ever determined him to pursue no other road. As soon, therefore, as he had put things in order, he marched at the head of a sufficient body of troops to reduce the Oritæ, who had never vouchsafed either to make their submission or to court his friendship. Their territories lay on the other side of a river called *Arabis*, which Alexander crossed so speedily, that they had no intelligence of his march; whereupon most of them quitted their country, and fled into the deserts. Their capital he found so well situated, that he resolved to take it out of their hands, and to cause a new and noble city to be founded there, the care of which he committed to Hephæstion. Then he received the deputies of the Oritæ and Gedrosi; and having assured them, that if the people returned to their villages, they should be kindly treated, and having appointed Apollphanes president of the Oritæ, and left a considerable body of troops under Leonatus to secure their obedience, he began his march thro' Gedrosia. In this march his troops suffered incredible hardships. The road was very uncertain and troublesome, on account of its lying thro' deep and loose sands, rising in many places into hillocks, which forced the soldiers to climb, at the same time that it sunk under their feet; there were no towns, villages, nor places of refreshment, to be met with; so that, after excessive marches, they were forced to encamp among these dry sands. As to provisions, they hardly met with any during their whole march. The soldiers were therefore obliged to kill their beasts of carriage: and such as were sent to bring some corn from the sea-side, were so grievously distressed, that, tho' it was sealed with the king's signet, they cut open the bags; choosing rather to die a violent death for disobedience, than perish by hunger. When the king, however, was informed of this, he freely pardoned the offenders; he was also forced to accept the excuses that were daily made for the loss of mules, horses, &c. which were in truth eaten by the soldiers, and their carriages broken in pieces to avoid further trouble. As for water, their want of it was a great misfortune; and yet their finding it in plenty was sometimes a greater: for, as by the first they perished with thirst, so by the latter they were burst,

throwa

64  
Is with difficulty saved by his men.

65  
He proceeds in his voyage down the Indus.

66  
Sets out for Babylon.

67  
His dangerous march through Gedrosia.



thrown into droppies, and rendered incapable of travel. Frequently they met with no water for the whole day together: sometimes they were disappointed of it at night; in which case, if they were able, they marched on; so that it was common with them to travel 30, 40, 50, or even 60 miles without encamping. Numbers thro' these hardships were obliged to lag in the rear; and of these many were left behind, and perished; for indeed scarce any ever joined the army again. Their miseries, however, they sustained with incredible patience, being encouraged by the example of their king; who, on this occasion, suffered greater hardships than the meanest soldier in his army. At last they arrived at the capital of Gedrosia, where they refreshed themselves, and staid some time: after which, they marched into Caramania; which being a very plentiful country, they there made themselves ample amends for the hardships and fatigues they had sustained. Here they were joined first by Craterus with the troops under his command, and a number of elephants; then came Stasanor president of the Arians, and Pharissmanes the son of Phrataphernes governor of Parthia. They brought with them camels, horses, and other beasts of burden, in vast numbers; having foreseen, that the king's march thro' Gedrosia would be attended with the loss of the greatest part, if not of all the cavalry and beasts belonging to his army.

During Alexander's stay in Caramania, he redressed the injuries of his people, who had been grievously oppressed by their governors during his absence. Here also he was joined by his admiral Nearchus, who brought him an account that all under his command were in perfect safety, and in excellent condition; with which the king was mightily pleased, and, after having bestowed on him singular marks of his favour, sent him back to the navy. Alexander next set out for Persia, where great disorders had been committed during his absence. These also he redressed, and caused the governor to be crucified; appointing in his room Peucestas, who saved his life when he fought singly against a whole garrison as above related. The new governor was no sooner invested with his dignity, than he laid aside the Macedonian garb, and put on that of the Medes; being the only one of Alexander's captains, who, by complying with the manners of the people he governed, gained their affection.

While Alexander visited the different parts of Persia, he took a view, among the ruins of the ruins of Persepolis, where he is said to have expressed great sorrow for the destruction he had formerly occasioned. From Persepolis he marched to Susa, where he gave an extraordinary loose to pleasure; resolving to make himself and his followers some amends for the difficulties they had hitherto undergone; purposing at the same time so effectually to unite his new-conquered with his hereditary subjects, that the jealousies and fears, which had hitherto tormented both, should no longer subsist. With this view he married two wives of the blood-royal of Persia; viz. Barsine, or Statira, the daughter of Darius, and Parysatis the daughter of Ochus. Drypetis, another daughter of Darius, he gave to Hephæstion; Amastriæ, the daughter of Oxyartes the brother of Darius, married Craterus; and to the rest of his friends, to the number of 80, he gave other women of the greatest quality. All these mar-

riages were celebrated at once, Alexander himself bestowing fortunes upon them: he directed likewise to take account of the number of his officers and soldiers who had married Asiatic wives; and tho' they appeared to be 10,000, yet he gratified each of them according to his rank. He next resolved to pay the debts of his army, and thereupon issued an edict directing every man to register his name and the sum he owed; with which the soldiers complying slowly, from an apprehension that there was some design against them, Alexander ordered tables heaped with money to be set in all quarters of the camp, and caused every man's debts to be paid on his bare word, without even making any entry of his name; tho' the whole sum came to 20,000 talents. On such a sad distinguished themselves in an extraordinary manner, he bestowed crowns of gold. Peucestas had the first; Leonatus the second; Nearchus the third; Onesicritus the fourth; Hephæstion the fifth; and the rest of his guards had each of them one. After this he made other dispositions for conciliating, as he supposed, the differences among all his subjects. He reviewed the 30,000 youths, whom at his departure for India he had ordered to be taught Greek, and the Macedonian discipline; expressing high satisfaction at the fine appearance they made, which rendered them worthy of the appellation he bestowed on them, viz. that of *Epigoni*, i. e. successors. He promoted also, without any distinction of nation, all those who had served him faithfully and valiantly in the Indian war. When all these regulations were made, he gave the command of his heavy-armed troops to Hephæstion, and ordered him to march directly to the banks of the Tigris, while in the mean time a fleet was equipped for carrying the king and the troops he retained with him down to the ocean.

Thus ended the exploits of Alexander; the greatest conqueror that ever the world saw, at least with respect to the rapidity of his conquests. In 12 years time he had brought under his subjection Egypt, Libya, Asia Minor, Syria, Phœnicia, Palestine, Babylonia, Persia, with part of India and Tartary. Still, however, he meditated greater things. He had now got a great taste in maritime affairs; and is said to have meditated a voyage to the coasts of Arabia and Ethiopia, and thence round the whole continent of Africa to the Straits of Gibraltar. But of this there is no great certainty; though that he intended to subdue the Carthaginians and Italians, is more than probable. All these designs, however, were frustrated by his death, which happened at Babylon in 323 B. C. He is said to have received several warnings of his approaching fate, and to have been advised to avoid that city; which advice he either despised or could not follow. He died of a fever after eight days illness, without naming any successor; having only given his ring to Perdicas, and left the kingdom, as he said, to the *most worthy*.

With the death of Alexander fell also the glory of the Macedonians; who very soon relapsed into a situation as bad, or worse than that in which they had been before the reign of Philip. This was occasioned principally by his not having distinctly named a successor; and having no child of his own come to the years of discretion, to whom the kingdom might seem naturally

Macedon

Pays the debts of his army.

He dies at Babylon.

Causes of the dissolution of his empire.

69  
He arrives in Caramania.69  
Redresses the grievances of his people.70  
Marries other two wives.

naturally to belong. The ambition and jealousy of his mother Olympias, his queen Roxana, and especially of the great commanders of his army, not only prevented a successor from being ever named, but occasioned the death of every person, whether male or female, who was in the least related to Alexander. To have a just notion of the origin of these disturbances, it is necessary in the first place to understand the situation of the Macedonian affairs at the time of Alexander's death.

When Alexander set out for Asia, he left Antipater, as we formerly observed, in Macedon, to prevent any disturbances that might arise either there or in Greece. The Greeks, even during the lifetime of Alexander, bore the superiority which he exercised over them with great impatience; and, though nothing could be more gentle than the government of Antipater, yet he was exceedingly hated, because he obliged them to be quiet. One of the last actions of Alexander's life set all Greece in a flame. He had, by an edict, directed all the cities of Greece to recall their exiles; which edict, when it was published at the Olympic games, created much confusion. Many of the cities were afraid, that, when the exiles returned, they would change the government; most of them doubted their own safety if the edict took place; and all of them held this peremptory decree to be a total abolition of their liberty. No sooner therefore did the news of Alexander's death arrive, than they prepared for war.

In Asia the state of things was not much better; not indeed through any inclination of the conquered countries to revolt, but through the dissensions among the commanders.—In the general council which was called soon after the death of Alexander, after much confusion and altercation, it was at last agreed, or rather commanded by the soldiers, that Aridæus the brother of Alexander, who had always accompanied the king, and had been wont to sacrifice with him, should assume the sovereignty.—This Aridæus was a man of very slender parts and judgment, not naturally, but by the wicked practices of Olympias, who had given him poisonous draughts in his infancy, left he should stand in the way of her son Alexander, or any of his family; and for this, or some other reason, Perdiccas, Ptolemy, and most of the horse-officers, resented his promotion to such a degree, that they quitted the assembly, and even the city. However, Meleager, at the head of the phalanx, vigorously supported their first resolution, and threatened loudly to shed the blood of those who affected to rule over their equals, and to assume a kingdom which no way belonged to them. Aridæus was accordingly arrayed in royal robes, had the arms of Alexander put upon him, and was saluted by the name of *Philip*, to render him more popular. Thus were two parties formed, at the head of whom were Meleager and Perdiccas; both of them pretending vast concern for the public good, yet, at bottom, desiring nothing more than their own advantage. Perdiccas was a man of high birth, had had a supreme command in the army, was much in favour with Alexander, and one in whom the nobility had put great confidence. Meleager was become formidable by having the phalanx on his side, and having the nominal king entirely in his power: for Aridæus, or Philip,

was obliged to comply with whatever he thought proper, and publicly declared, that whatever he did was by the advice of Meleager; so that he made his minister accountable for his own schemes, and no way endangered himself. The Macedonians also, besides their regard for the deceased king, soon began to entertain a personal love for Philip, on account of his moderation.

It is remarkable, however, that notwithstanding all the favours which Alexander had conferred upon his officers, and the fidelity with which they had served him during his life, only two of them were attached to the interests of his family after his death. These were Antipater, and Eumenes the Cardian, whom he had appointed his secretary. Antipater, as we have already seen, was embroiled with the Greeks, and could not assist the royal family who were in Asia; and Eumenes had not as yet sufficient interest to form a party in their favour. In a short time, however, Perdiccas prevailed against Meleager, and got him murdered <sup>76</sup> by which means the supreme power for a time fell into his hands. His first step, in consequence of this power, was to distribute the provinces of the empire among the commanders in the following manner, in order to prevent competitors, and to satisfy the ambition of the principal commanders of the army. Aridæus, and the son of Roxana, born after the death of his father, were to enjoy the regal authority. Antipater had the government of the European provinces. Craterus had the title of *protector*. Perdiccas was general of the household troops in the room of Hephæstion. Ptolemy the son of Lagos had Egypt, Libya, and that part of Arabia which borders upon Egypt. Cleomenes, a man of infamous character, whom Alexander had made receiver-general in Egypt, was made Ptolemy's deputy. Leomedon had Syria; Philotas, Cilicia; Pithon, Media; Eumenes, Cappadocia, Paphlagonia, and all the country bordering on the Euxine Sea, as far as Trapezus; but these were not yet conquered, so that he was a governor without a province. Antigonus had Pamphylia, Lycia, and Phrygia Major; Cassander, Caria; Menander, Lydia; Leonatus, Phrygia on the Hellespont.

In the mean time, not only Alexander's will, but Alexander himself, was so much neglected, that his body was allowed to remain seven days before any notice was taken of it, or any orders given for its being embalmed. The only will he left was a short memorandum of six things he would have done.—1. The building of a fleet of 1000 stout galleys, to be made use of against the Carthaginians and other nations, who should oppose the reduction of the sea-coasts of Africa and Spain, with all the adjacent islands, as far as Sicily. 2. A large and regular highway was to be made along the coast of Africa, as far as Ceuta and Tangier. 3. Six temples of extraordinary magnificence were to be erected at the expence of 1500 talents each. 4. Castles, arsenals, havens, and yards, for building ships, to be settled in proper places throughout his empire. 5. Several new cities were to be built in Europe and Asia; those in Asia to be inhabited by colonies from Europe, and those in Europe to be filled with Asiatics; that, by blending their people and their manners, that hereditary antipathy might be eradicated which had hitherto subsisted

Meleager murdered, and the empire divided.

<sup>74</sup>  
Aridæus appointed king.

<sup>75</sup>  
A party formed by Meleager, and another by Perdiccas.

<sup>77</sup>  
Alexander's body neglected, and his will set aside.

Macedon.

Macedon.

subfisted between the inhabitants of the different continents. 6. Lastly, he had projected the building of a pyramid, equal in bulk and beauty to the biggest in Egypt, in honour of his father Philip. All these designs, under pretence of their being expensive, were referred to a council of Macedonians, to be held nobody knew when, or where.

The government, being now in the hands of Perdiccas and Roxana, grew quickly very cruel and distasteful. Alexander was scarce dead when the queen sent for Statira and Drypetis, the two daughters of Darius, one of whom had been married to Alexander, and the other to Hephaestion; but as soon as they arrived at Babylon, caused them both to be murdered, that no son of Alexander by any other woman, or of Hephaestion, might give any trouble to her or her son Alexander. Sygambis, the mother of Darius, no sooner heard that Alexander the Great was dead, than she laid violent hands on herself, being apprehensive of the calamities which were about to ensue.

78  
The daughters of Darius put to death by Roxana.

69  
The Greeks revolt, but are subdued.

War was first declared in Greece against Antipater in the year 321 B. C. Through the treachery of the Thessalians, that general was defeated, with the army he had under his own command. Leonatus was therefore sent from Asia, with a very considerable army, to his assistance; but both were overthrown with great loss by the confederates, and Leonatus himself was killed. In a short time, however, Craterus arrived in Greece with a great army, the command of which he resigned to Antipater. The army of the confederates amounted to 25,000 foot, and 3000 horse; but Antipater commanded no fewer than 40,000 foot, 3000 archers, and 5000 horse. In such an unequal contest, therefore, the Greeks were defeated, and forced to sue for peace; which they did not obtain but on condition of their receiving Macedonian garrisons into several of their cities. At Athens also the democratic government was abrogated; and such a dreadful punishment did this seem to the Athenians, that 22,000 of them left their country, and retired into Macedon.

80  
Disturbances in Asia and Thrace.

While these things were doing in Greece, disturbances began also to arise in Asia and in Thrace. The Greek mercenaries, who were dispersed through the inland provinces of Asia, despairing of ever being allowed to return home by fair means, determined to attempt it by force. For this purpose, they assembled to the number of 20,000 foot, and 3000 horse; but were all cut off to a man by the Macedonians. In Thrace, Lyfmachus was attacked by one Seuthes, a prince of that country who claimed the dominions of his ancestors, and had raised an army of 20,000 foot and 8000 horse. But though the Macedonian commander was forced to engage this army with no more than 4000 foot and 2000 horse, yet he kept the field of battle, and could not be driven out of the country. Perdiccas, in the mean time, by pretending friendship to the royal family, had gained over Eumenes entirely to his interest; and at last put him in possession of the province of Cappadocia by the defeat of Ariarathes king of that country, whom he afterwards cruelly caused to be crucified. His ambition, however, now began to lead him into difficulties. At the first division of the provinces, Perdiccas, to strengthen his own

81  
Ambition and cruelty of Perdiccas.

authority, had proposed to marry Nicæa the daughter of Antipater; and so well was this proposal relished, that her brethren Jollas and Archias conducted her to him, in order to be present at the celebration of the nuptials. But Perdiccas now had other things in view. He had been solicited by Olympias to marry her daughter Cleopatra, the widow of Alexander king of Epirus, and who then resided at Sardis in Lydia. Eumenes promoted this match to the utmost of his power, because he thought it would be for the interest of the royal family; and his persuasions had such an effect on Perdiccas, that he was sent to Sardis to compliment Cleopatra, and to carry presents to her in name of her new lover. In the absence of Eumenes, however, Alcetas, the brother of Perdiccas, persuaded him to marry Nicæa; but, in order to gratify his ambition, he resolved to divorce her immediately after marriage, and marry Cleopatra. By this last marriage, he hoped to have a pretence for altering the government of Macedon; and, as a necessary measure preparative to these, he entered into contrivances for destroying Antigonus. Unfortunately for himself, however, he ruined all his schemes by his own jealousy and precipitate cruelty. Cynane, the daughter of Philip by his second wife, had brought her daughter named *Adda*, and who was afterwards named *Eurydice*, to court, in hopes that king Arideus might marry her. Against Cynane, Perdiccas, on some political motives, conceived such a grudge, that he caused her to be murdered. This raised a commotion in the army: which frightened Perdiccas to such a degree, that he now promoted the match between Arideus and Eurydice; to prevent which, he had murdered the mother of the young prince. But, in the mean time, Antigonus, knowing the designs of Perdiccas against himself, fled with his son Demetrius to Greece, there to take shelter under the protection of Antipater and Craterus, whom he informed of the ambition and cruelty of the regent.

A civil war was now kindled. Antipater, Craterus, Neoptolemus, and Antigonus, were combined against Perdiccas; and it was the misfortune of the empire in general, that Eumenes, the most able general, as well as the most virtuous of all the commanders, was on the side of Perdiccas, because he believed him to be in the interest of Alexander's family. Ptolemy, in the mean time, remained in quiet possession of Egypt; but without the least intention of owning any person for his superior; however, he also acceded to the league formed against Perdiccas; and thus the only person in the whole empire who consulted the interest of the royal family was Eumenes.

It was now thought proper to bury the body of Alexander, which had been kept for two years, during buried in all which time preparations had been making for it. Aridans, to whose care it was committed, set out from Babylon for Damascus, in order to carry the king's body to Egypt. This was fore against the will of Perdiccas; for it seems there was a superstitious report, that wherever the body of Alexander was laid, that country should flourish most. Perdiccas, therefore, out of regard to his native soil, would have it conveyed to the royal sepulchres in Macedon; but Arideus, pleading the late king's express direction, was determined to carry it into Egypt, from thence

82  
A combination against him.

83  
Egypt.



Macedon.

Macedon.

to be conveyed to the temple of Jupiter Ammon. —The funeral was accordingly conducted with all imaginable magnificence. Ptolemy came to meet the body as far as Syria: but, instead of burying it in the temple of Jupiter Ammon, erected a stately temple for it in the city of Alexandria; and, by the respect he shewed for his dead master, induced many of the Macedonian veterans to join him, and who were afterwards of the greatest service to him.

84  
Perdiccas  
killed by  
his own  
men.

No sooner was the funeral over, than both the parties above mentioned fell to blows. Perdiccas marched against Ptolemy; but was slain by his own men, who, after the death of their general, submitted to his antagonist; and thus Eumenes was left alone to contend against all the other generals who had served under Alexander. In this contest, however, he would by no means have been overmatched, had his soldiers been attached to him; but as they had been accustomed to serve under those very generals against whom they were now to fight, they were on all occasions ready to betray and desert Eumenes. However, he defeated and killed Neoptolemus and Craterus, but then found himself obliged to contend with Antipater and Antigonus. Antipater was now appointed protector of the kings, with sovereign power; and Eumenes was declared a public enemy. A new division of Alexander's empire took place. Egypt, Libya, and the parts adjacent, were given to Ptolemy because they could not be taken from him. Syria was confirmed to Leomedon. Philoxenus had Cilicia. Mesopotamia and Arbelitis were given to Amphimachus. Babylon was bestowed on Seleucus. Susiana fell to Antigonus, who commanded the Macedonian *Argyraspe* or *Silver Shields*, because he was the first who opposed Perdiccas. Peucestas held Persia. Cleopolemus had Caramania. Pithon had Media as far as the Caspian straits. Stasander had Aria and Drangia. Philip, Parthia. Stasenor, Bactria and Sogdiana. Sybirtius, Aracopia. Oxyartes, the father of Roxana, Parapomis. Another Pithon had the country between this province and India. Porus and Taxiles held what Alexander had given them, because they would not part with any of their dominions. Cappadocia was assigned to Nicanor. Phrygia Major, Lycania, Pamphylia, and Lycia, were given to Antigonus. Caria to Cassander, Lydia to Clytus, Phrygia the Less to Aridaeus, Cassander was appointed general of the horse; while the command of the household troops was given to Antigonus, with orders to prosecute the war against Eumenes. —Antipater having thus settled every thing as well as he could, returned to Macedon with the two kings, to the great joy of his countrymen, having left his son Cassander to be a check upon Antigonus in Asia.

Matters now seemed to wear a better aspect than they had yet done; and, had Eumenes believed that his enemies really consulted the interest of Alexander's family, there is not the least doubt that the war would have been immediately terminated. He saw, however, that the design of Antigonus was only to set up for himself, and therefore he refused to submit. From this time, therefore, the Macedonian empire ceased in Asia; and an account of the transactions of this part of the world fall to be recorded under the article SYRIA. The Macedonian affairs are now en-

tirely confined to the kingdom of Macedon itself, and to Greece.

Antipater had not long been returned to Macedon, when he died; and the last action of his life completed the ruin of Alexander's family. Out of a view to the public good, he had appointed Polyperchon, the eldest Alexander's captains at hand, to be *protector* and *governor* of Macedon. This failed not to disgust his son Cassander; who thought he had a natural right to these offices, and of course kindled a new civil war in Macedon. This was indeed highly promoted by his first actions as a governor. He began with attempting to remove all the governors appointed in Greece by Antipater, and to restore democracy wherever it had been abolished. The immediate consequence of this was, that the people refused to obey their magistrates; the governors refused to resign their places, and applied for assistance to Cassander. Polyperchon also had the imprudence to recall Olympias from Epirus, and allow her a share in the administration; which Antipater, and even Alexander himself, had always refused her. The consequence of all this was, that Cassander invaded Greece, where he prevailed against Polyperchon; Olympias returned to Macedon, where she cruelly murdered Aridaeus and his wife Eurydice; she herself was put to death by Cassander, who afterwards caused Roxana and her son to be murdered; and Polyperchon being driven into Etolia, first raised to the crown Hercules the son of Alexander by the daughter of Darius, and then by the instigation of Cassander murdered him, by which means the line of Alexander the Great became totally extinct.

Cassander having thus destroyed all the royal family, assumed the regal title, as he had for 16 years before had all the power. He enjoyed the title of *king of Macedon* only three years; after which he died, about 298 B.C. By Thessalonica, the daughter of Philip king of Macedon, he left three sons, Philip, Antipater, and Alexander. Philip succeeded him, but soon after died of a consumption. A contest immediately began between the two brothers, Antipater and Alexander. Antipater seized the kingdom; and to secure himself in it, murdered his mother Thessalonica, if not with his own hand, at least the execrable fact was committed in his presence. Alexander invited Pyrrhus king of Epirus, and Demetrius the son of Antigonus, to assist him and revenge the death of his mother. But Pyrrhus being bought off, and a peace concluded between the brothers, Alexander, being afraid of having too many protectors, formed a scheme of getting Demetrius assassinated. Instead of this, however, both he and Antipater were put to death; and Demetrius became king of Macedon four years after the death of Cassander.

In 287 B.C. Demetrius was driven out by Pyrrhus, who was again driven out by Lyfimachus two years after, who was soon after killed by Seleucus Nicator; and Seleucus, in his turn, was murdered by Ptolemy Ceraunus, who became king of Macedon about 280 B.C. The new king was in a short time cut off, with his whole army, by the Gauls; and Antigonus Gonatus, the son of Demetrius Poliorcetes, became king of Macedon in 278 B.C. He proved successful against the Gauls, but was driven out by Pyrrhus king of Epirus; who, however, soon dislodged his subjects to such a degree,

85  
Total de-  
struction of  
Alexander's fa-  
mily.

85  
A new di-  
vision of  
the empire.

87  
Various re-  
volutions  
in the go-  
vernment.

Macedon. degree, that Antigonos recovered a great part of his kingdom. But in a little time, Pyrrhus being killed at the siege of Argos in Greece, Antigonos was restored to the whole of Macedon; but scarcely was he seated on the throne, when he was driven from it by Alexander the son of Pyrrhus. This new invader was, in his turn, expelled by Demetrius the son of Antigonos; who, though at that time but a boy, had almost made himself master of Epirus. In this enterprise, however, he was disappointed; but by his means Antigonos was restored to his kingdom, which he governed for many years in peace. By a stratagem he made himself master of the city of Corinth, and from that time began to form schemes for the thorough conquest of Greece. The method he took to accomplish this was, to support the petty tyrants of Greece against the free states: which indeed weakened the power of the latter; but involved the whole country in so many calamities, that these transactions could not redound much to the reputation either of his arms or his honour. About 243 B. C. he died, leaving the kingdom to his son, Demetrius II.

25  
W r with  
the Ro-  
mans.

Neither Demetrius, nor his successor Antigonos Dofon, performed any thing remarkable. In 221 B. C. the kingdom fell to Philip, the last but one of the Macedonian monarchs. To him Hannibal applied for assistance after the battle of Cannæ, which he refused; and the same imprudence which made him refuse this assistance prompted him to embroil himself with the Romans; and at last to conclude a treaty with them, by which he in effect became their subject, being tied up from making peace or war but according to their pleasure. In 179 B. C. he was succeeded by his eldest son Perfes, under whom the war with the Romans was renewed. Even yet the Macedonians were terrible in war; and their phalanx, when properly conducted, seems to have been absolutely invincible by any method of making war known at that time. It consisted of 16,000 men, of whom 1000 marched abreast, and thus was 16 men deep, each of whom carried a kind of pike 23 feet long. The soldiers stood so close, that the pikes of the fifth rank reached their points beyond the front of the battle. The hindermost ranks leaned their pikes on the shoulders of those who went before them, and, locking them fast, pressed briskly against them when they made the charge; so that the first five ranks had the impetus of the whole phalanx, which was the reason why the shock was generally irresistible. The Romans had never encountered such a terrible enemy; and in the first battle, which happened 171 B. C. they were defeated with the loss of 2200 men, while the Macedonians lost no more than 60. The generals of Perfes now pressed him to storm the enemy's camp; but he being naturally of a cowardly disposition refused to comply, and thus the best opportunity he ever had was lost. Still, however, the Romans gained little or no advantage, till the year 168 B. C. when Paulus Æmilius, a most experienced commander, was sent into Macedon. Perfes now put all upon the issue of a general engagement; and Æmilius, with all his courage and military experience, would have been defeated, had the Macedonians been commanded by a general of the smallest courage or conduct. The light-armed Macedonians charged with such vigour, that, after the battle, some of their bodies were found with-

in two furlongs of the Roman camp. When the phalanx came to charge, the points of their spears striking into the Roman shields, kept the heavy-armed troops from making any motion; while, on the other hand, Perfes's light-armed men did terrible execution. On this occasion, it is said, that Æmilius tore his clothes, and gave up all hopes. However, perceiving that as the phalanx gained ground it lost its order in several places, he caused his own light-armed troops to charge in those places, whereby the Macedonians were soon put into confusion. If Perfes with his horse had on the first appearance of this charged the Romans briskly, his infantry would have been able to recover themselves; but, instead of this, he betook himself to flight, and the infantry at last did the same, but not till 20,000 of them had lost their lives.

This battle decided the fate of Macedonia, which immediately submitted to the conqueror. The cowardly king took refuge in the island of Samothrace; but was at last obliged to surrender to the Roman consul, by whom he was carried to Rome, led in triumph, and afterwards most barbarously used. Some pretenders to the throne appeared afterwards; but being unable to defend themselves against the Romans, the country was reduced to a Roman province in 148 B. C. To them it continued subject till the year 1357, when it was reduced by the Turkish sultan Bajazet, and hath remained in the hands of the Turks ever since.

MACEDONIANS, Christian heretics, in the 4th century; followers of Macedonius, bishop of Constantinople.

Macedonius was an Arian, and governed the church in a very tyrannical manner. He translated the body of the emperor Constantine from the church of the Apostles to that of Acacius the martyr; which raised great tumults, and many were killed in the fray. He was deposed by the council of Constantinople in 350.

Repentment, it was thought, at being deposed, occasioned his forming a new heresy, which consisted in denying the divinity of the Holy Ghost; for which reason his followers were likewise called *Pneumatomachi*, that is, *enemies of the Holy Ghost*. They taught that the Holy Ghost was a mere creature, but superior in excellence to the angels.

The Macedonians make extraordinary professions of austerity; which induced great numbers to embrace their doctrine. Most of the malevolent bishops subscribed to it, and the Arians in general greedily swallowed it. Maratonus, bishop of Nicomedia, a very rich man, contributed greatly by his wealth and authority to spread it far and wide; whence the Macedonians were sometimes called *Maratonians*.

Athanafius, who at that time lay concealed in the desert, was the first who wrote against this heresy, and confuted it; after which, the councils by their decrees, and the emperors by their edicts, prosecuted it with great vigour.

MACEDONIUS. See MACEDONIANS.

MACERATION, is an infusion of, or soaking ingredients in water or any other fluid, in order either to soften them, or draw out their virtues.

MACERATA, a handsome and populous town of Italy, in the territory of the church, and in the Marche of Ancona, with a bishop's see, and an university.

Macedonia  
||  
Macerata.

89  
Macedonia  
becomes a  
Roman  
province.

Machian  
Machine.

verity. It is seated near the mountain Chiento, in E. Long. 13. 37. N. Lat. 43. 15.

**MACHIAN**, one of the Molucca islands, in the East Indian Ocean, about 20 miles in circumference, and the most fertile of them all. It likewise produces the best cloves; and is in possession of the Dutch, who have three strong forts built on it.

**MACHIAVEL** (Nicholas), a famous political writer of the 16th century, was born of a distinguished family at Florence. He wrote in his native language with great elegance and politeness, though he understood very little of the Latin tongue; but he was in the service of Marcellus Virgilius, a learned man, who pointed out to him many of the beautiful passages in the ancients, which Machiavel had the art of placing properly in his works. He composed a comedy upon the ancient Greek model; in which he turned into ridicule many of the Florentine ladies, and which was so well received, that pope Leo X. caused it to be acted at Rome. Machiavel was secretary, and afterwards historiographer, to the republic of Florence. The house of Medicis procured him this last office, together with a handsome salary, in order to pacify his resentment for his having suffered the torture upon suspicion of his being an accomplice in the conspiracy of the Soderini against that house, when Machiavel bore his sufferings without making any confession. The great encomiums he bestowed upon Brutus and Cassius, both in his conversations and writings, made him strongly suspected of being concerned in another conspiracy against cardinal Julian de Medicis, who was afterwards pope under the name of *Clement VII.* However, they carried on no proceedings against him; but from that time he turned every thing into ridicule, and gave himself up to irreligion. He died in 1530, of a remedy which he had taken by way of prevention.—Of all his writings, that which has made the most noise, and has drawn upon him the most enemies, is a political treatise entitled the *Prince*; which has been translated into several languages, and wrote against by many authors. The world is not agreed as to the motives of this work; some thinking, he meant to recommend tyrannical maxims; others, that he only delineated them to excite abhorrence. Machiavel also wrote Reflections on Titus Livy, which are extremely curious; The History of Florence, from the year 1205 to 1494; and a quarto volume of poems and other pieces. Mr Harrington considers him as a superior genius, and as the most excellent writer on politics and government that ever appeared.

**MACHINE**, **MACHINA**, in the general, signifies any thing that serves to augment, or to regulate moving powers: or it is any body destined to produce motion, so as to save either time or force. The word comes from the Greek μηχανή, “machine, invention, art.” And hence, in strictness, a machine is something that consists more in art and invention, than in the strength and solidity of the materials; and for this reason it is that the inventors of machines are called *ingenieurs* or *engineers*.

Machines are either simple or compound. The simple ones are the seven mechanical powers, viz. lever, balance, pulley, axis and wheel, wedge, screw, and inclined plane.

From these the compound ones are formed by various

combinations, and serve for different purposes. See *Machinery* *Mechanics* and *Hydrostatics*; also the articles *Centrifugal*, *Fire*, *Steam*, *Furnace*, *Burroughs*, *Ramsden*, &c.

**MACHINERY**, in epic and dramatic poetry, is when the poet introduces the use of machines; or brings some supernatural being upon the stage, in order to solve some difficulty, or to perform some exploit out of the reach of human power.

The ancient dramatic poets never made use of machines, unless where there was an absolute necessity for so doing; whence the precept of Horace;

*Nec Deus interfit, nisi dignus vindice nodus  
Inciderit.*

It is quite otherwise with epic poets, who introduce machines in every part of their poems; so that nothing is done without the intervention of the gods. In Milton's paradise lost, by far the greater part of the actors are supernatural personages: Homer and Virgil do nothing without them; and, in Voltaire's *Henriade*, the poet has made excellent use of St Louis.

As to the manner in which these machines should act, it is sometimes invisibly, by simple inspirations and suggestions; sometimes by actually appearing under some human form; and, lastly, by means of dreams and oracles, which partake of the other two. However, all these should be managed in such a manner as to keep within the bounds of probability.

**MACHINLETH**, a town of Montgomeryshire in North Wales, seated on the river Doway; over which is a large stone bridge that leads into Merionethshire. W. Long. 3. 55. N. Lat. 52. 34.

**MACKENZIE**, (Sir George), an able lawyer, a polite scholar, and a celebrated wit, was born at Dundee in the county of Angus in Scotland in 1636, and studied at the universities of Aberdeen and St Andrews; after which he applied himself to the civil law, travelled into France, and prosecuted his study in that faculty for about three years. At his return to his native country, he became an advocate in the city of Edinburgh; and soon gained the character of an eminent pleader. He did not, however, suffer his abilities to be confined entirely to that province. He had a good taste for polite literature; and he gave the public, from time to time, incontestable proofs of an uncommon proficiency therein. He had practised but a few years, when he was promoted to the office of a judge in the criminal court; and, in 1674, was made king's advocate, and one of the lords of the privy council in Scotland. He was also knighted by his majesty. In these stations he met with a great deal of trouble, on account of the rebellions which happened in his time; and his office of advocate requiring him to act with severity, he did not escape being censured, as if in the deaths of some particular persons who were executed he had stretched the laws too far. But there does not seem to have been any just foundation for this clamour against him; and it is generally agreed, that he acquitted himself like an able and upright magistrate. Upon the abrogation of the penal laws by king James II. our advocate, tho' he had always been remarkable for his loyalty, and even censured for his zeal against traitors and fanatics, thought himself obliged to resign his post; being convinced, that he could not discharge the duties of it in that point with a good



Mackarel  
Maclaurin

conference. But he was soon after restored, and held his offices till the revolution; an event which, it seems, he could not bring himself to approve. He had hoped that the prince of Orange would have returned to his own country when matters were adjusted between the king and his subjects; and upon its proving otherwise, he quitted all his employments in Scotland, and retired into England, resolving to spend the remainder of his days in the university of Oxford. He arrived there in September 1689, and prosecuted his studies in the Bodleian library, being admitted a student there, by a grace passed in the congregation, June 2. 1690. In the spring following, he went to London; where he fell into a disorder, of which he died in May 1691. His corpse was conveyed by land to Scotland, and interred there with great pomp and solemnity.

“The politeness of his learning, and the sprightliness of his wit, were (says the reverend Mr Granger) conspicuous in all his pleadings, and shone in his ordinary conversation. Mr Dryden acknowledges, that he was unacquainted with what he calls the *beautiful turn of words and thoughts in poetry*, till they were explained and exemplified to him in a conversation with that noble wit of Scotland Sir George Mackenzie.—He wrote several pieces of history and antiquities; Institutions of the laws of Scotland; Essays upon various subjects, &c. His works were printed together at Edinburgh in 1716, in vols folio.

MACKEREL, in ichthyology. See SCOMBER.

MACKEY (John), an Englishman, employed by the government as a spy upon James II. after the revolution, was author of Memoirs of James's court at St Germaine, and of the court of England in the reigns of William III. and queen Anne; in which are many curious anecdotes not to be met with in any other work. He died in 1726.

MACLAURIN (Colin), a most eminent mathematician and philosopher, the son of a clergyman, and born at Kilmoddan in Scotland in 1698. He was sent to the university of Glasgow in 1709, and took the degree of master of arts in his 15th year; on which occasion he composed and defended a thesis on the power of gravity with great applause. In 1717, he obtained the professorship of mathematics in the Marischal college of Aberdeen against a very able competitor; and, going afterwards to London, contracted an acquaintance with Sir Isaac Newton, Dr Hoadley, Dr Clarke, Martin Folkes, &c. with other eminent men; and was admitted a member of the Royal Society. In 1722 he travelled as tutor to the eldest son of lord Polwarth; and at Lorrain wrote his piece On the percussion of bodies, which gained the prize of the Royal Academy of Sciences in 1724; but, on the death of his pupil at Montpellier, he returned immediately to Aberdeen. He was hardly settled there, when he was chosen to supply the place of Mr James Gregory, as professor at Edinburgh, where his mathematical scholars soon became very numerous. In 1745, having been very active in fortifying the city of Edinburgh against the rebel army, he was obliged to fly into the north of England; in which expedition he laid the foundation of an illness that put an end to his life in 1746. He published A complete system of fluxions, 2 vols 4to; several curious papers in the Philosophical Transactions, and in the Edinburgh Medical Essays;

and after his death assisted his Algebra, and Account of Sir Isaac Newton's philosophical discoveries. His peculiar merit as a philosopher was, that all his studies were directed to general utility, and promoting mechanical arts.

MACRIN (Salmon), one of the best Latin poets of the 16th century, was born at Loudun. His true name was *John Salmon*; but he took that of *Macrin*, from his being frequently so called in ridicule by Francis I. on account of his extraordinary leanness. He was preceptor to Claudius of Savoy, count of Tende; and to Honorius the count's brother; and wrote several pieces of poetry in lyric verse, which were so admired, that he was called the *Horace of his time*. He died of old age, at Loudun, in 1555.—Charles Macrin, his son, was not inferior to him as a poet, and surpassed him in his knowledge of the Greek tongue. He was preceptor to Catharine of Navarre, the sister of Henry the Great; and perished in the massacre on St Bartholomew's day in 1572.

MACROBIUS (Aurelius), lived about the end of the fourth century. He was one of Theodosius's chamberlains, or one of his wardrobe. His *Saturnalia* is a pleasant mixture of criticism and antiquity. He also composed some commentaries upon that part of Cicero called *Scipio's dream*.

MACROCERCI, a name given to that class of animalcules which have tails longer than their bodies.

MACROCOSM, a word denoting the great world or universe. It is compounded of the Greek words *μακρ*, “great,” and *κοσμ*, “world.”

MACROPYRENIUM, in natural history, a genus of fossils consisting of crustated septaria; with a long nucleus standing out at each end of the mass.

MACROTELOSTYLA, in natural history, the name of a genus of crystals, which are composed of two pyramids joined to the end of a column; both the pyramids, as also the column, being hexangular, and the whole body consequently composed of 18 planes.

MACULÆ, in astronomy, dark spots appearing on the luminous surfaces of the sun and moon, and even some of the planets. See ASTRONOMY, Sect. II. and III.

MAD-APPLE. See SOLANUM.

MADAGASCAR, or ST LAURENCE, the largest of the African islands, situated between 43° and 51° of E. Long. and between 12° and 26° of S. Lat. It extends near 1000 miles from north-north-east to south-south-west, and about 300 in breadth where broadest. The whole coast is divided by rivers; and there are many bays and gulphs, with good roads and harbours. It abounds in corn, cattle, fowls, and all manner of animals and vegetables found on the continent of Africa; and affords an agreeable variety of hills, valleys, woods, and champaign. Great quantities of iron and steel are found throughout this island, which their artificers forge and purify with less difficulty and labour than Europeans. Their method is this: They reduce the ore, as brought from the mines, into powder, place it upon burning coals between four stones, which are clayed round for the purpose; and, by continual blowing underneath, with bellows made in the shape of gun-barrels or water-pumps, the ore runs in less than an hour; whence the metal being afterwards

Macrin  
Madagascar

Madagascar  
Madder.

wards extracted, by great heat, is formed into bars of three or four pounds weight. It is confidently affirmed, that the island has also mines of gold and silver, and of a white metal much like British tin. The rivers and brooks are rich in various kinds of precious stones, in crystals, topazes, amethysts, eagle-stones, emeralds, sapphires, hyacinths, jaspers, blood-stones, &c.

The inhabitants are of different complexions and religions: some white, some negroes; some Mohammedans, some Pagans. The whites, and those of a tawny complexion, who inhabit the coasts, are descended from the Arabs, as is evident from their language and their religious rites: but here are no mosques, temples, nor any stated worship, except that they offer sacrifices of beasts on particular occasions; as when sick, when they plant yams or rice, when they hold their assemblies, circumcise their children, declare war, enter into new built houses, and bury their dead. The country is divided into a great many petty princes, who are continually at war with one another, as upon the continent; selling their prisoners or slaves to the shipping which touch there; and taking cloathing, utensils, and other necessaries, in return. The French had once some settlements upon the island; but, at present, neither they nor any other European nation have any.

#### MADDER. See RUBIA.

Madder is a plant, the uses of which were well known to the ancients, both in respect to manufactures and physic. The Greek authors call this plant *erythrodanum*, from *erythros*, "red;" the Latins, on the same principle *rubia*; and it is styled *rubia tinctorum*, from the use made of it in dyeing. Dioscorides and Galen do not insist upon its tinging quality. But the former describes, and both to explain, its medicinal virtues, as to leave no doubt as to the plant. Pliny, who commonly agrees with Dioscorides, mentions both its uses, but in different books of his history. In respect to its medical qualities, they are followed by later authors; but the nature of the colour extracted from its roots was left to such as wrote the history of the arts. With their roots they dyed wool and leather; and from these and other parts of the plant they formed a variety of medicines, to which great virtues were attributed by their ablest physicians. They had it likewise both wild and cultivated, the best sort of the latter growing, in the time of Pliny, in the neighbourhood of Rome.

As madder is a very valuable commodity, so the raising and curing it in perfection is a work of much time, trouble, and expence, for all which it pays abundantly at last. The soil best suited to this plant is a soft sandy loam, which must be properly prepared by repeated and deep ploughings, so as to render it perfectly even and fine. The young shoots for the cultivated madder is not propagated by seed, but must be planted in the course of the month of April upon ridges at three feet distance, and the plants themselves at a foot and an half distance from each other. They remain three summers in the ground; and during that space are to be carefully hoed, kept clean from weeds, and properly earthed up. They are drawn about the month of September, and must be then conveyed immediately to the drying-house,

built like those used by the tanners for their skins, except that hurdles are used in them instead of floors, that the air may have free access to the roots every way. After remaining there four or five days, and the earth perfectly cleared from them, they are carried to the cold stove, where they are farther, but very slowly, dried by the help of flues placed in the sides of the building. This being done, the madder is carried next to the floor, where it is threshed from its bark or outward rind; which, however, is swept together, barrelled up, and is what the Dutch call *mill*, which sometimes sells for eight pounds a ton, and thereby commonly defrays the expence of drying. The roots thus cleared are then conveyed to the warm stove, where the drying is gradually completed. From thence they are sent to the mill, and there ground, sorted, and packed up in casks fit for sale. In these several operations, which must all be performed with great care and exactness, the commodity loses so much of its weight, that 700 or 800 of the green will seldom make more than 100 of the dry madder. The time, trouble, and expence attending the cultivation of madder in this method have induced some, particularly the French, to endeavour to find out some expedients to shorten the process, and by ridding themselves of stoves and mills to lessen the charge. It is certainly right to examine and to consider their attempts. But, on the other hand, there is, with all its prolixity and labour, something very worthy of attention in this mode of the Dutch. The dyers use madder in different ways and for different purposes, which are all suited by the several divisions of the madder, by which all is sold, each fetches its just price, and the dyers find some or other of these sorts adapted to every intention, which is a great and apparent convenience.

The Dutch are at present possessed of an almost absolute monopoly of this valuable commodity, the cultivation of which they were taught by the Flemings; who, persecuted for their religion, long since took shelter amongst them. In times past we imported madder by the way of Hamburg from Silesia, and also from Flanders; whereas we now have it only from Holland. This that people have brought about by their unwearied industry, their careful management, and indefatigable attention. It is in a particular manner the great staple of Zealand; where, in the small isle of Schouwen, they raise annually 1000 tons; for the curing of which there are about 20 stoves, each provided with a proper number of able workmen, by whom every thing is accurately and excellently performed at a settled and very moderate price, and under the most prudent and equitable regulations. When the work is finished, the madder, according to its fineness, is divided into several sorts; and, after being inspected by persons deputed by the magistrates, each sort is put up in casks with marks declaring its nature, and the arms of the town of Zirikzee painted on them, which authenticate their contents wherever they are exported. The assayers are sworn duly to respect the ordinances of Zealand, of which there are several, very explicit and well considered. The casks, besides the arms of the town, have the name of the stove, where made, and the quality of the madder, painted on them; and thus the credit and the reputation of the different parties are staked, which excites a constant attention and emulation

Madder.

ation amongst them. This plant is also cultivated not only in the other islands which compose that province, but likewise in different parts of the dominions of the United Provinces, from whence it is sent in immense quantities over all Europe.

In proportion as industry, arts, and commerce, came to prevail, and to be understood here, it was very clearly discerned that our dependance upon another nation, for an article so necessary to the progress of several manufactures, was pregnant with many inconveniences, besides the constant drain of money, not only for the benefit, but even at the will of strangers, who set what prices they pleased on what could not be wanted. In the reign of Charles I. a patent was granted to Mr Shipman the king's gardener for planting and curing of madder; which he did, and brought it to very great perfection, till, ruined by the confusion of the times, he was constrained to part with his stock, and give over the trade. We have this fact from Mr Blyth, who having been an officer in the parliament army became afterwards a great promoter of agriculture and all sorts of improvements, and is consequently a competent and unsuspected witness. He says, that Mr Shipman planted madder, and set up his works at Barn Elms, and that his commodity was highly commended by its only proper judges the dyers. It is evident therefore, that at this time we were possessed of this valuable article, which might have been found had in plenty as well as in perfection. If this opportunity had been taken, and the cultivation of madder (as it might have been) universally introduced, it would be no difficult matter to demonstrate, that this nation might have been the richer for it by some millions.

It was again attempted by Sir Nicholas Crispe, a man of extraordinary abilities, and of great public spirit, as also by persons well skilled therein at Wifbech, who, notwithstanding many obstacles that were thrown in their way, would certainly have succeeded, had not the Dutch reduced, and for a time kept the price so low, that for want of support they were constrained to give up the making of madder. This had so bad an effect, that notwithstanding the growing of this plant for physical uses and for curiosity in many private gardens, no thoughts were entertained of cultivating it to a large extent, and for the purposes of dyeing, till within these few years. It then appeared so reasonable in itself, and of such public utility, that an act of parliament was obtained to facilitate the design, which act hath been since continued, and many other marks have been given of public approbation. Stat. 31 G. II. in the preamble, the great advantages that would attend the cultivation of madder are succinctly stated; and for promoting so important a design, the tythe of every acre on which it is planted is fixed at five shillings from August 2. 1758 for 14 years. Stat. 5. Geo. III. c. 18. after reciting, that the price of the commodity hath been raised, continues the tythe at five shillings an acre for 14 years farther from the expiration of the former act. The society also for the encouraging arts, manufactures, and commerce, have promised very considerable and well considered premiums for the encouraging this very expensive improvement, as also (which may be of no small importance) for the cultivation of our own wild madder. It

may be considered therefore at present as in a state of progression; and there is very little room to doubt, that, as experience in the management of it increases, this important enterprise will move faster, till it reaches the point of perfection.

It certainly imports us, both in honour and interest, to prosecute this improvement, now it is begun, with vigour. We have all the advantages we can reasonably wish to prompt our endeavours, as we have a great variety of soils as fit for the cultivation of this plant as any in Zealand or Flanders, and are in no danger of being confined in point of room.

The root of madder impregnates water with a dull red colour, and spirit of wine with a deep bright red. This root, when eat by animals along with their food, tinges their urine, and their most solid bones, of a deep red. Wool previously boiled in a solution of alum and tartar, receives from a hot decoction of madder and tartar a very durable but not a very beautiful red colour. Mr Margraaf (Berlin Mem. 1771), shews how a very durable lake of a fine red colour, fit for the purposes of painting, may be obtained from madder. This process is as follows: Take two ounces of the purest Roman alum, and dissolve it in three French quarts of distilled water that has boiled, and in a clean glazed pot. Set the pot on the fire; and when the water begins to boil, withdraw it, and add two ounces of the best Dutch madder. Boil the mixture once or twice; then remove it from the fire, and filter it through a double filtre of paper not coloured. Let the liquor thus filtrated stand a night to settle, and pour off the clear liquor into the glazed pot previously well cleaned. Make the liquor hot, and add to it gradually a clear solution of salt of tartar in water, till all the madder is precipitated. Filtrate the mixture; and upon the red precipitate which remains upon the filter pour boiling distilled water, till the water no longer acquires a saline taste. The red lake is then to be gently dried. No other water, neither rain nor river water, produces so good a colour as that which has been distilled, and the quantity required of this is considerable. The colour of the above precipitate is deep; but if two parts of madder be used to one part of alum, the colour will be still deeper: one part of madder and four parts of alum produces a beautiful rose colour.

MADERAS, a cluster of islands situated in the Atlantic ocean in W. Long. 16°, and between 32° and 33° N. Lat.—The largest of them, called *Madeira*, from which the rest take their name, is about 55 English miles long, and 10 miles broad; and was first discovered on the 2d of July, in the year 1419, by Joao Gonzales Zarco, there being no historical foundation for the fabulous report of its discovery by one Machin an Englishman. It is divided into two capitania, named *Funchal* and *Maxico*, from the towns of those names. The former contains two judicatures, viz. *Funchal* and *Calhetta*; the latter being a town with the title of a county, belonging to the family of *Castello Melhor*. The second capitania likewise comprehends two judicatures, viz. *Maxico* (read *Machico*) and *San Vicente*.

*Funchal* is the only cidade or city in this island, which has also seven villas or towns; of which there



are four, Calheta, Camara de Lobos, Ribeira braba, and Ponta de Sol in the capitania of Funchal, which is divided into 26 parishes. The other three are in the capitania of Maxico, which consist of 17 parishes; these towns are called *Maxico*, *San Vicente*, and *Santa Cruz*.

The governor is at the head of all the civil and military departments of this island, of Porto-Santo, the Salvages, and the Ilhas Defartas; which last only contain the temporary huts of some fishermen, who resort thither in pursuit of their business.

The law-department is under the corregidor, who is appointed by the king of Portugal, commonly sent from Lisbon, and holds his place during the king's pleasure. All causes come to him from inferior courts by appeal. Each judicature has a senate; and a *Juiz* or judge, whom they choose, presides over them. At Funchal he is called *Juiz da Fora*; and in the absence, or after the death of the corregidor, acts as his deputy. The foreign merchants elect their own judges, called the *Providor*, who is at the same time collector of the king's customs and revenues, which amount in all to about 12,000 l. Sterling. Far the greatest part of this sum is applied towards the salaries of civil and military officers, the pay of troops, and the maintenance of public buildings. This revenue arises, first from the tenth of all the produce of this island belonging to the king, by virtue of his office as grand master of the order of Christ; secondly, from ten per cent. duties laid on all imports, provisions excepted; and lastly, from the eleven per cent. charged on all exports.

The island has but one company of regular soldiers of 100 men: the rest of the military force is a militia consisting of 3000 men, divided into companies, each commanded by a captain, who has one lieutenant under him, and one ensign. There is no pay given to either the private men, or the officers of this militia; and yet their places are much sought after, on account of the rank which they communicate. These troops are embodied once a year, and exercised once a-month. All the military are commanded by the *Serjeante Mór*. The governor has two *Capitanes de Sal* about him, who do duty as aides-de-camp.

The secular priests on the island are about 1200, many of whom are employed as private tutors. Since the expulsion of the Jesuits, no regular public school is to be found here; unless we except a seminary, where a priest, appointed for that purpose, instructs and educates ten students at the king's expence. These wear a red cloak over the usual black gowns worn by ordinary students. All those who intend to go into orders, are obliged to qualify themselves by studying in the university of Coimbra, lately re-established in Portugal. There is also a dean and chapter at Madeira, with a bishop at their head, whose income is considerably greater than the governor's; it consists of 110 pipes of wine, and of 40 muids of wheat, each containing 24 bushels; which amounts in common years to 3000 l. Sterling. Here are likewise 60 or 70 Franciscan friars, in four monasteries, one of which is at Funchal. About 300 nuns live on the island, in four convents, of the order of Mercis, Sta. Clara, Incarnacao, and Bom Jesus. Those of the last mentioned institution may marry whenever they

choose, and leave their monastery.

In the year 1768, the inhabitants living in the 43 parishes of Madeira, amounted to 63,913, of whom there were 31,341 males, and 32,572 females. But in that year 5243 persons died, and no more than 2198 children were born; so that the number of the dead exceeded that of the born by 3045. It is highly probable that some epidemical distemper carried off so disproportionate a number in that year, as the island would shortly be entirely depopulated if the mortality were always equal to this. Another circumstance concurs to strengthen this supposition, namely, the excellence of the climate. The weather is in general mild and temperate: in summer, the heat is very moderate on the higher parts of the island, whither the better sort of people retire for that season; and in the winter the snow remains there for several days, whilst it is never known to continue above a day or two in the lower parts.

The common people of this island are of a tawny colour, and well shaped; though they have large feet, owing perhaps to the efforts they are obliged to make in climbing the craggy paths of this mountainous country. Their faces are oblong, their eyes dark; their black hair naturally falls in ringlets, and begins to crisp in some individuals, which may perhaps be owing to intermarriages with negroes; in general, they are hard-featured, but not disagreeable. Their women are too frequently ill-favoured, and want the florid complexion, which, when united to a pleasing assemblage of regular features, gives our northern fair ones the superiority over all their sex. They are small, have prominent cheek-bones, large feet, an ungraceful gait, and the colour of the darkest brunette. The just proportion of the body, the fine form of their hands, and their large, lively eyes, seem in some measure to compensate for those defects. The labouring men, in summer, wear linen trowsers, a coarse shirt, a large hat, and boots; some have a short jacket made of cloth, and a long cloak, which they sometimes carry over their arm. The women wear a petticoat, and a short corselet or jacket, closely fitting their shapes, which is a simple, and often not an elegant dress. They have also a short, but wide cloak; and those that are unmarried, tie their hair on the crown of their head, on which they wear no covering.

The country people are exceeding sober and frugal; their diet in general consisting of bread and onions, or other roots, and little animal-food. However, they avoid eating tripe, or any offals, because it is proverbially said of a very poor man, "he is reduced to eat tripe." Their common drink is water, or an infusion on the remaining rind or skin of the grape (after it has passed through the wine-press), which when fermented acquires some tartness and acidity, but cannot be kept very long. The wine for which the island is so famous, and which their own hands prepare, seldom if ever regales them.

Their principal occupation is the planting and raising of vines; but as that branch of agriculture requires little attendance during the greatest part of the year, they naturally incline to idleness. The warmth of the climate, which renders great provision against the inclemencies of weather unnecessary, and the ease with

with which the cravings of appetite are satisfied, must tend to indolence, wherever the regulations of the legislature do not counteract it, by endeavouring, with the prospect of increasing happiness, to infuse the spirit of industry. It seems the Portuguese government does not pursue the proper methods against this dangerous lethargy of the state. They have lately ordered the plantation of olive-trees here, on such spots as are too dry and barren to bear vines; but they have not thought of giving temporary assistance to the labourers, and have offered no premium by which these might be induced to conquer their reluctance to innovations and aversion to labour.

The vineyards are held only on an annual tenure, and the farmer reaps but four-tenths of the produce, since four other tenths are paid in kind to the owner of the land, one-tenth to the king, and one to the clergy. Such small profits, joined to the thought of toiling merely for the advantage of others, if improvements were attempted, entirely preclude the hopes of a future increase. Oppressed as they are, they have however preserved a high degree of cheerfulness and contentment; their labours are commonly alleviated with songs, and in the evening they assemble from different cottages to dance to the drowsy music of a guitar.

The inhabitants of the towns are more ill-favoured than the country-people, and often pale and lean. The men wear French clothes, commonly black, which do not seem to fit them, and have been in fashion in the polite world about half a century ago. Their ladies are delicate, and have agreeable features; but the characteristic jealousy of the men still locks them up, and deprives them of a happiness which the country-women, amidst all their distresses, enjoy. Many of the better people are a sort of *petite noblesse*, which we would call *gentry*, whose genealogical pride makes them unforgivable and ignorant, and causes a ridiculous affectation of gravity. The landed property is in the hands of a few ancient families, who live at Funchal, and in the various towns on the island.

Madeira consists of one large mountain, whose branches rise every where from the sea towards the centre of the isle, converging to the summit, in the midst of which is a depression or excavation, called the *Val* by the inhabitants, always covered with a fresh and delicate herbage. The stones on the isle seem to have been in the fire, are full of holes, and of a blackish colour; in short, the greater part of them are lava. A few of them are of the kind which the Derbyshire miners call *dunstone*. The soil of the whole island is a tarras mixed with some particles of clay, lime, and sand, and has much the same appearance as some earths on the isle of Aicénson. From this circumstance, and from the excavation of the summit of the mountain, it is probable, that in some remote period, a volcano has produced the lava and the ochreous particles, and that the Val was formerly its crater.

Many brooks and small rivulets descend from the summits in deep chasms or glens, which separate the various parts of the isle. The beds of the brooks are in some places covered with stones of all sizes, carried down from the higher parts by the violence of winter-rains or floods of melted snow. The water is conducted by weirs and channels in the vineyards, where

each proprietor has the use of it for a certain time; some being allowed to keep a constant supply of it, some to use it thrice, others twice, and others only once a-week. As the heat of the climate renders this supply of water to the vineyards absolutely necessary, it is not without great expence that a new vineyard can be planted; for the maintenance of which, the owners must purchase water at a high price, from those who are constantly supplied, and are thus enabled to spare some of it.

Wherever a level piece of ground can be contrived in the higher hills, the natives make plantations of eddoes enclosed by a kind of dike to cause a stagnation, as that plant succeeds best in swampy ground. Its leaves serve as food for hogs, and the country-people use the roots for their own nourishment.

The sweet potatoe is planted for the same purpose, and makes a principal article of diet; together with chestnuts, which grow in extensive woods, on the higher parts of the island, where the vine will not thrive. Wheat and barley are likewise sown, especially in spots where the vines are decaying through age, or where they are newly planted. But the crops do not produce above three months provisions; and the inhabitants are therefore obliged to have recourse to other food, besides importing considerable quantities of corn from North America in exchange for wine. The want of manure, and the inactivity of the people, are in some measure the causes of this disadvantage; but supposing husbandry to be carried to its perfection here, they could not raise corn sufficient for their consumption. They make their threshing-floors of a circular form, in a corner of a field, which is cleared and beaten solid for the purpose. The sheaves are laid round about it; and a square board, stuck full of sharp flints below, is dragged over them by a pair of oxen, the driver getting on it to increase its weight. This machine cuts the straw as if it had been chopped, and frees the grain from the hulk, from which it is afterwards separated.

The great produce of Madeira is the wine, from which it has acquired fame and support. Where the soil, exposure, and supply of water, will admit of it, the vine is cultivated. One or more walks, about a yard or two wide, intersect each vineyard, and are included by stone-walls two feet high. Along these walks, which are arched over with laths about seven feet high, they erect wooden pillars at regular distances, to support a lattice-work of bamboos, which slopes down from both sides of the walk, till it is only a foot and a half or two feet high, in which elevation it extends over the whole vineyard. The vines are in this manner supported from the ground, and the people have room to root out the weeds which spring up between them. In the season of the vintage they creep under this lattice-work, cut off the grapes, and lay them into baskets: some bunches of these grapes weigh six pounds and upwards. This method of keeping the ground clean and moist, and ripening the grapes in the shade, contributes to give the Madeira wines that excellent flavour and body for which they are remarkable. The owners of vineyards are however obliged to allot a certain spot of ground for the growth of bamboos; for the lattice-work cannot

Medias  
Madox.

Madrais  
+  
Madrid.

be made without them; and it is said some vineyards lie quite neglected for want of this useful reed.

The wines are not all of equal goodness, and consequently of different prices. The best, made of a vine imported from Candia by order of the Infante of Portugal, Don Henry, is called *Madeira Malinssey*, a pipe of which cannot be bought on the spot for less than 40 or 42 l. Sterling. It is an exceeding rich sweet wine, and is only made in a small quantity. The next sort is a dry wine, such as is exported for the London market, at 30 or 31 l. Sterling the pipe. Inferior sorts for the East India, West India, and North American markets, sell at 28, 25, and 20 l. Sterling. About 30,000 pipes, upon a mean, are made every year, each containing 110 gallons. About 13,000 pipes of the better sorts are exported; and all the rest is made into brandy for the Brazils, converted into vinegar, or consumed at home.

The inclosures of the vineyards consist of walls, and hedges of prickly pear, pomegranates, myrtles, brambles, and wild roses. The gardens produce peaches, apricots, quinces, apples, pears, walnuts, chestnuts, and many other European fruits; together with now and then some tropical plants, such as bananas, goavas, and pine-apples.

All the common domestic animals of Europe are likewise found at Madeira; and their mutton and beef, though small, is very well tasted. Their horses are small, but sure-footed; and with great agility climb the difficult paths, which are the only means of communication in the country. They have no wheel-carriages of any kind; but in the town they use a sort of drays or sledges, formed of two pieces of plank joined by cross pieces, which make an acute angle before; these are drawn by oxen, and are used to transport casks of wine, and other heavy goods, to and from the warehouses.

The animals of the feathered tribe, which live wild here, are more numerous than the wild quadrupeds; there being only the common grey rabbit here, as a representative of the last-mentioned class. Tame birds, such as turkeys, geese, ducks, and hens, are very rare, which is perhaps owing to the scarcity of corn.

There are no snakes whatsoever in Madeira; but all the houses, vineyards, and gardens, swarm with lizards. The friars of one of the convents complained to Mr Forster, that these vermin destroyed the fruit in their garden; they had therefore placed a brass-kettle in the ground to catch them, as they are constantly running about in quest of food. In this manner they daily caught hundreds, which could not get out on account of the smooth sides of the kettle, but were forced to perish.

The shores of Madeira, and of the neighbouring Salvages and Deserts, are not without fish; but as they are not in plenty enough for the rigid observance of Lent, pickled herrings are brought from Gotteburg in English bottoms, and salted cod from New York and other American ports, to supply the deficiency.

MADNESS, a most dreadful kind of delirium, without a fever. See (the *Index* subjoined to) MEDICINE.

MADDOX (Dr Isaac), an ingenious and worthy prelate, born of obscure parents about the year 1696, who placed him apprentice to a pastry-cook; but not

relishing this employment, and having an inclination to learning, he was put to school by some friends, and completed his studies at Aberdeen. He entered into orders; and having the good fortune to be made chaplain to Dr Bradford bishop of Chichester, he married his niece, a very sensible and worthy lady. From this time his preferment may be dated: he was made king's chaplain, clerk of the closet to queen Caroline, and about the year 1736 bishop of St Asaph; from whence, in 1743, he was translated to Worcester. He was an excellent preacher, and a great promoter of public charities; particularly the Worcester infirmary, and the hospital for inoculating the small-pox at London: his sermon in favour of this latter institution, preached in 1752, was much admired, and contributed greatly to extend the practice of inoculation. He published some other single sermons, and *A defence of the doctrine and discipline of the church of England*, in answer to Mr Neale's *History of the Puritans*. Dr Madox died in 1759.

MADRASS. See *St GEORGE*.

MADRE DE PORA, a town and convent of South America, in Terra Firma, seated on the river Grande. It is almost as much resorted to by pilgrims of America, as Loretto is in Europe; and the image of the Virgin Mary is said to have done many miracles in favour of the sea-faring people. W. Lon. 76. o. N. Lat. 11. o.

MADRID, a town of New Castile in Spain, and capital of the whole kingdom, though it never had the title of a *city*, is situated in W. Lon. 3. 5. N. Lat. 40. 26. It stands in the centre of a large plain, surrounded with mountains, and in the very heart of Spain, on the banks of the little river Manzanares, which is always very low and shallow, except when it is swelled by the melting of the snow on the mountains. The streets here are wide, straight, and handsome, and adorned with several fine fountains; the houses fair and lofty, but built of brick, with lattice-windows, excepting those of the rich, who have glass in their windows; only, during the summer-heats, they use gauze, or some such thin stuff, instead of it, to let in the fresh air. There are two stately bridges here over the Manzanares, several beautiful squares, a great many magnificent churches, convents, palaces, and hospitals: among the last is one for all nations and distempers, with a large revenue. Around the placemayor, or grand square, are piazzas, with houses all uniform, and a continued line of balconies, for viewing the bull-fights and other public shews exhibited in it. The royal palace, which stands on the west side of the town, on an eminence, is spacious and magnificent, consisting of three courts, and commanding a fine prospect. At the east end of the town is the Prado, or pardo; which is a delightful plain, planted with regular rows of poplar trees, and watered with a great many fountains; where the nobility and gentry take the air on horseback, or in their coaches, and the common people on foot, or divert themselves with a variety of sports and exercises. The compass of the whole town is computed at about nine miles, and the number of its inhabitants at about 150,000. It is well supplied with provisions of all kinds, at reasonable rates; and the court, with the resort and residence of the quality, and the high colleges and offices that are kept



Madrigal  
Mæcenas.

kept here, occasion a brisk trade and circulation of money. There are three royal academies; one for the improvement of the Spanish language, another for history, and another for medicine. Nothing, in short, is wanting to make this place extremely commodious and agreeable, but cleanliness; which, it seems, is not such a favourite with the inhabitants as it deserves. The environs are very pleasant, and contain several royal seats; among which are El Buen Retiro, Casa del Campo, Florida, Le Pardo, Sarfuela, and St Ildefonso; but the most magnificent, not only in this country, but perhaps in the whole world, is the Escorial, which takes its name from a small village, near which it stands, about 22 miles north-west from Madrid; and of which a description is given under the article ESCURIAL. Another royal palace, greatly admired, particularly for its delicious gardens and surprising water-works, is Aranjuez, which is situated on the Tagus, about 30 miles south of Madrid.

MADRIGAL, a short amorous poem, composed of a number of free and unequal verses, neither confined to the regularity of a sonnet, nor to the point of an epigram; but only consisting of some tender and delicate thought, expressed with a beautiful, noble, and elegant simplicity.

Menage derives the word from *mandra*, which, in Latin and Greek, signifies "a sheep-fold;" imagining it to have been originally a kind of pastoral, or shepherd's song; whence the Italians formed their *madrigale*, and we *madrigal*. Others rather choose to derive it from the word *madrugar*, which, in the Spanish language, signifies "to rise in the morning;" the *madrigaler* being formerly sung early in the morning by those who had a mind to serenade their mistresses.

MADURA, a province of Asia, in the peninsula on this side the Ganges; bounded on the east by Tanjour and Marava, on the south-east by the sea, on the west by the Balagete mountains, which separate it from Malabar, and on the north by Vissapour and Carnate. The inhabitants are Gentoos, and of a thievish disposition. The commodities are rice, elephants teeth, and cotton-cloth; of which last a great deal is made here, and very fine. The Dutch have a pearl-fishery, which brings them in a large sum annually.

MEANDER, (anc. geog.), a river rising in Phrygia from a common source with the Marfyas near Celæne, according to Maximus Tyrius an eye-witness: remarkable for its windings, (Ovid); whence the proper name *Meander* is become an appellative. It runs from east to west, till it discharges itself into the Ægean sea, about a mile from Miletus. A narrow river, but very deep, (Calaber); running calm, and fertilizing the country, as it passes along, with its mud, (Pliny).

MÆCENAS (Caius Cilnius), the great friend and counsellor of Augustus Cæsar, was himself a very polite scholar, but is chiefly memorable for having been the patron and protector of men of letters. He was descended from a most ancient and illustrious origin, even from the kings of Etruria, as Horace often tells us; but his immediate forefathers were only of the equestrian order. He is supposed to have been

born at Rome, because his family lived there; but in what year, antiquity does not tell us. It says as little about his education; but we know it must have been of the most liberal kind, and perfectly agreeable to the dignity and splendor of his birth, since he excelled in every thing that related to arms, politics, and letters. How Mæcenas spent his younger years is also unknown to us, any farther than by effects; there being no mention made of him, by any writer, before the death of Julius Cæsar, which happened in the year of Rome 709. Then Octavius Cæsar, who was afterwards called *Augustus*, went to Rome, to take possession of his uncle's inheritance; and then Mæcenas became first publicly known, though he appears to have been Augustus's intimate friend, and, as it should seem, guardian, from his childhood. From that time he accompanied him through all his fortunes, and was his counsellor and adviser upon all occasions; so that Pedo Albinovanus justly called him *Cæsar's dextram*, "Cæsar's right-hand."

In A. R. 710, the year that Cicero was killed and Ovid born, Mæcenas distinguished himself by his courage and military skill at the battle of Modena, where the consuls Hirtius and Panfa were slain in fighting against Antony; as he did afterwards at Philippi. After this last battle began the memorable friendship between Mæcenas and Horace. Horace, as Suetonius relates, was a tribune in the army of Brutus and Cassius, and, upon the defeat of those generals, made a prisoner of war. Mæcenas, finding him an accomplished man, became immediately his friend and protector; and afterwards recommended him to Augustus, who restored to him his estate, with no small additions. In the mean time, though Mæcenas behaved himself well as a soldier in these and other battles, yet his principal province was that of a minister and counsellor. He was the adviser, the manager, the negotiator, in every thing that related to civil affairs. When the league was made at Brundisium between Antony and Augustus, Mæcenas was sent to act on the part of Augustus. This we learn from Horace, in his journey to Brundisium:

*Hoc venturus erat Mæcenas optimus, atque  
Cocceius, missi magnis de rebus uterque  
Legati, aversos soliti componere amicos.* Sat. v. l. i.

And afterwards, when this league was near breaking, through the suspicions of each party, Mæcenas was sent to Antony, to ratify it anew.

In the year 717, when Augustus and Agrippa went to Sicily to fight Sextus Pompeius by sea, Mæcenas went with them; but soon after returned, to appease some commotions which were rising at Rome: for though he usually attended Augustus in all his military expeditions, yet, whenever there was any thing to be done at Rome, either with the senate or people, he was always dispatched thither for that purpose.

Upon the total defeat of Antony at Actium, Mæcenas returned to Rome, to take the government into his hands, till Augustus could settle some necessary affairs in Greece and Asia. Agrippa soon followed Mæcenas; and when Augustus arrived, he placed these two great men and faithful adherents, the one over his civil, the other over his military concerns. While Augustus

Mæcenas.

gustus was extinguishing the remains of the civil war in Asia and Egypt, young Lepidus, the son of the triumvir, was forming a scheme to assassinate him at his return to Rome. This conspiracy was discovered at once, by the extraordinary vigilance of Mæcenas; who, as Velleius Paterculus says, "observing the rash counsels of the headstrong youth with the same tranquillity and calmness as if nothing at all had been doing, instantly put him to death, without the least noise and tumult; and by that means extinguished another civil war in its very beginning."

The civil wars being now at an end, Augustus returned to Rome; and from this time Mæcenas indulged himself, at vacant hours, in literary amusements, and the conversation of men of letters. In the year 734 Virgil died, and left Augustus and Mæcenas heirs to what he had. Mæcenas was excessively fond of this poet, who, of all the wits of the Augustan age, stood highest in his esteem; and, if the *Georgics* and the *Æneid* be owing to the good taste and encouragement of this patron, as there is some reason to think, posterity cannot commemorate him with too much gratitude. Horace may be ranked next to Virgil in Mæcenas's good graces: we have already mentioned, how and at what time their friendship commenced. Propertius also acknowledges Mæcenas for his favourite and protector, lib. ii. eleg. 7. Nor must Varius be forgot, though we have nothing of his remaining; since we find him highly praised by both Virgil and Horace. He was a writer of tragedies; and Quintilian thinks he may be compared with any of the ancients. In a word, Mæcenas's house was a place of refuge and welcome to all the learned of his time; not only to Virgil, Horace, Propertius, and Varius, but to Fundarius, whom Horace extols as an admirable writer of comedies; to Fuscus Arilius, a noble grammarian, and Horace's intimate friend; to Plotius Tucca, who assisted Varius in correcting the *Æneid* after the death of Virgil; to Valgius, a poet and very learned man, who, as Pliny tells us, dedicated a book to Augustus *De usu herbarum*; to Asinius Pollio, an excellent tragic writer; and to several others, whom it would be tedious to mention. All these dedicated their works, or some part of them at least, to Mæcenas, and celebrated his praises in them over and over: and we may observe farther, what Plutarch tells us, that even Augustus himself inscribed his Commentaries to him and to Agrippa.

Mæcenas continued in Augustus's favour to the end of his life, but not uninterruptedly. Augustus had an intrigue with Mæcenas's wife; and, though the minister bore this liberty of his master's very patiently, yet there was a coldness on the part of Augustus, which, however, soon went off. Mæcenas died in the year 745, but at what age we cannot precisely determine; though we know he must have been old. He must have been older than Augustus, because he was a kind of tutor to him in his youth; and then find him often called *an old man* by Pedro Albinovanus, a cotemporary poet, whose elegy upon his dead patron is still extant. He made Augustus his heir; and recommended his friend Horace to him, in those memorable last words, "*Horatii*

*Flacci, ut mei, memor esto, &c.*" Horace, however, did not probably survive him long, as there is no elegy of his upon Mæcenas extant, nor any account of one having ever been written, which there certainly would have been, had Horace survived him any time. Nay, father Sanadon, the French editor of Horace, will have it, that the poet died before his patron; and that these last words were found only in Mæcenas's will, which had not been altered.

Mæcenas is said never to have enjoyed a good state of health in any part of his life; and many singularities are related of his bodily constitution. Thus Pliny tells us, that he was always in a fever; and that, for three years before his death, he had not a moment's sleep. Though he was certainly an extraordinary man, and possessed many admirable virtues and qualities, yet it is agreed on all hands, that he was very luxurious and effeminate. "Mæcenas (says Velleius Paterculus) was of the equestrian order, but sprung from a most illustrious origin. He was a man, who, when business required, was able to undergo any fatigue and watching; who consulted properly upon all occasions, and knew as well how to execute what he had consulted; yet a man, who, in seasons of leisure, was luxurious, soft, and effeminate, almost beyond a woman. He was no less dear to Cæsar than Agrippa, but distinguished by him with fewer honours; for he always continued of the equestrian rank, in which he was born: not that he could not have been advanced upon the least intimation, but he never solicited it."

But let moralists and politicians determine of Mæcenas as they please, the men of letters are under high obligations to celebrate his praises, and revere his memory: for he countenanced, protected, and supported, as far as they wanted his support, all the wits and learned men of his time; and that too, out of a pure and disinterested love of letters, when he had no little views of policy to serve by their means: whence it is no wonder, that all the protectors and patrons of learning, ever since, have usually been called *Mæcenas's*.

MAELSTROM, a very dangerous whirlpool on the coast of Norway, in the 68th degree of latitude, in the province of Nordland, and the district of Lofoden, and near the island of Moskoe-fjorom. Its violence and roarings exceed that of a cataract, being heard to a great distance, and without any intermission, except a quarter every sixth hour, that is, at the turn of high and low water, when its impetuosity seems at a stand, which short interval is the only time the fishermen can venture in: but this motion soon returns, and, however calm the sea may be, gradually increases with such a draught and vortex as absorb whatever comes within their sphere of action, and keep it under water for some hours, when the fragments, shivered by the rocks, appear again. This circumstance, among others, makes strongly against Kircher and others, who imagine that there is here an abyss penetrating the globe, and issuing in some very remote parts, which Kircher is so particular as to assign, for he names the gulph of Bothnia. But after the most exact researches which the circumstances will admit, this is but a conjecture without foundation; for this and three other vortices

Mæcenas,  
Maelstrom

vortices among the Ferroe islands, but smaller, have no other cause, than the collision of waves rising and falling, at the flux and reflux, against a ridge of rocks and shelves, which confine the water so that it precipitates itself like a cataract; and thus the higher the flood rises, the deeper must the fall be; and the natural result of this is a whirlpool or vortex, the prodigious suction whereof is sufficiently known by lesser experiments. But what has been thus absorbed, remains no longer at the bottom than the ebb lasts; for the suction then ceases, and the flood removes all attraction, and permits whatever had been sunk to make its appearance again. Of the situation of this amazing Moskoeffrom we have the following account from Mr Jonas Ramus, "The mountain of Helsinggen, in Lofoden, lies a league from the island Ver, and betwixt these two runs that large and dreadful stream called *Moskoeffrom*, from the island Moskoe, which is in the middle of it, together with several circumjacent isles, as Ambaeren, half a quarter of a league northward, Isfesen, Hoeholm, Kieldholm, Suarven, and Buckholm. Moskoe lies about half a quarter of a mile south of the island of Ver, and betwixt them these small islands, Otterholm, Flimen, Sandflesen, Skarholm. Betwixt Lofoden and Moskoe, the depth of the water is between 36 and 40 fathoms; but on the other side, towards Ver, the depth increases so as not to afford a convenient passage for a vessel, without the risk of splitting on the rocks, which happens even in the calmest weather: when it is flood, the stream runs up the country betwixt Lofoden and Moskoe, with a boisterous rapidity; but the roar of its impetuous ebb to the sea, is scarce equalled by the loudest and most dreadful cataracts; the noise being heard several leagues off, and the vortices or pits are of such an extent and depth, that if a ship comes within its attraction, it is inevitably absorbed and carried down to the bottom, and there beat to pieces against the rocks; and when the water relaxes, the fragments thereof are thrown up again. But these intervals of tranquillity are only at the turn of the ebb and flood, in calm weather; and last but a quarter of an hour, its violence gradually returning. When the stream is most boisterous, and its fury heightened by a storm, it is dangerous to come within a Norway mile of it; boats, ships, and yachts having been carried away, by not guarding against it before they were within its reach. It likewise happens frequently, that whales come too near the stream, and are overpowered by its violence; and then it is impossible to describe their howlings and bellowsings in their fruitless struggles to disengage themselves. A bear once attempting to swim from Lofoden to Moskoe, with a design of preying upon the sheep at pasture in the island, afforded the like spectacle to the people; the stream caught him, and bore him down, whilst he roared terribly, so as to be heard on shore. Large flocks of firs and pine trees, after being absorbed by the current, rise again, broken and torn to such a degree, as if bristles grew on them. This plainly shows the bottom to consist of craggy rocks, among which they are whirled to and fro. This stream is regulated by the flux and reflux of the sea; it being constantly high and low water every six hours. In the year 1645, early in the morning of Sexagesima Sunday, it raged with such noise and impetuosity, that on the

island of Moskoe, the very stones of the houses fell to the ground."

**MÆMACTERION**, the fourth month of the Athenian year, consisting of only 29 days, and answering to the latter part of September and the beginning of October.

**MÆNA**, in ichthyology. See **SPARUS**.

**MÆONIA**, (anc. geog.), a town of Lydia, situate at the foot of mount Tmolus. *Mæonii*, the people. *Mæonia*, (Homer, Ovid), the feminine gentilitious name: hence *Mæonides*, the muses, (Ovid). *Mæonides* denotes also Homer, (Ovid).

**MÆOTIS PALUS** or **LACUS**, *Meotica Palus*, or *Mæoticus Lacus*, (anc. geog.), a lake of Sarmatia Europea, extending from the Isthmus to the mouth of the Tanais to the east, in compass 9000 stadia, (Strabo). Still called *Palus Mæotis*, reaching from Crim Tartary to the mouth of the Don.

**MÆSTLIN** (Michael), in Latin *Mæstlinus*, a celebrated astronomer of Germany, was born in the duchy of Wittenberg; but spent his youth in Italy, where he made a speech in favour of Copernicus's system, which brought Galileo over from Aristotle and Ptolemy, to whom he had been hitherto entirely devoted. He afterwards returned to Germany, and became professor of mathematics at Tübingen; where, among his other scholars, he taught the great Kepler, who has praised several of his ingenious inventions, in his *Astronomia Optica*. Though Tycho Brahe did not assent to Mæstlin's opinion, yet he allowed him to be an extraordinary person deeply skilled in the science of astronomy. Mæstlin published many mathematical and astronomical works; and died in 1590.

**MÆSTRICHT**, an ancient, large, and strong town of the Netherlands, ceded to the Dutch by the treaty of Munster. The town-house and the other public buildings are handiome, and the place is about four miles in circumference, and strongly fortified. It is governed jointly by the Dutch and the bishop of Liege; however, it has a Dutch garrison. The inhabitants are noted for making excellent fire-arms, and some say that in the arsenal there are arms sufficient for a whole army. Both Papists and Protestants are allowed the free exercise of their religion, and the magistrats are composed of both. It is seated on the river Maese, which separates it from Wyck, and with which it communicates by a handiome bridge. Mæstricht revolted from the Spaniards in 1570, but was reduced in 1579. Lewis XIV. became master of it in 1673; but it was restored to the states by the treaty of Nimeguen in 1678. E. Long. 5. 50. N. Lat. 51. 5.

**MAFFÆUS** (Vegio), a Latin poet, born in Lombardy in 1407, was greatly admired in his time. He wrote epigrams, and a humorous supplement to Virgil, which he called *The thirteenth book of the Æneid*: this was as humorously translated into English a few years since by Mr Ellis. Maffæus wrote also some prose-works. He was chancellor of Rome towards the end of the pontificate of Martin V.; and died in 1458.

**MAFFEI** (Scipio), a celebrated Italian poet, born of an illustrious and ancient family at Verona, in 1675. After having finished his studies, he took arms, and distinguished himself by his valour at the battle of Do-



Magadoxo  
Magazine.

nawert; but he more particularly distinguished himself by his love of learning, which made him undertake several voyages into France, England, and Germany. He conversed with the learned in all those countries, and obtained their friendship and esteem. He was a member of the Academy of the Arcadia at Rome, an honorary foreign member of that of Inscriptions at Paris; and died in 1755. He wrote many works in verse and prose, which are esteemed; the most known of which are, 1. The tragedy of Merope, of which there are two French translations in prose. 2. Ceremony, a comedy. 3. A translation, into Italian verse, of the first book of Homer's Iliad. 4. Many other pieces of poetry, in a collection intitled *Rhyme and Prose*, quarto. His principal works in prose, are, 1. *Verona illustrata*. 2. *Istoria diplomatica*. 3. *Scienza cavalleresca*; an excellent work, in which he attacks duelling. 4. An edition of *Theatro Italiano*. 5. An edition of Cassiodorus on the Epistles, AAs of the Apostles, and Apocalypse. 6. *Gallia antiquitates quedam selectæ, atque in plures epistolas distributæ*, and several other works.

MAGADOXO, the capital town of a kingdom of the same name, in Africa, and on the coast of Ajan; seated near the mouth of a river of the same name, defended by a citadel, and has a good harbour. The inhabitants are Mohammedans. E. Long. 45. 15. N. Lat. 3. 0.

MAGAZINE, a place in which stores are kept, of arms, ammunition, provisions, &c. Every fortified town ought to be furnished with a large magazine, which should contain stores of all kinds, sufficient to enable the garrison and inhabitants to hold out a long siege; and in which smiths, carpenters, wheel-wrights, &c. may be employed in making every thing belonging to the artillery, as carriages, wagons, &c.

*Powder-MAGAZINE*, is that place where the powder is kept in very large quantities. Authors differ greatly both with regard to the situation and construction; but all agree, that they ought to be arched and bomb-proof. In fortifications, they are frequently placed in the rampart; but of late they have been built in different parts of the town. The first powder-magazines were made with Gothic arches: but M. Vauban finding them too weak, constructed them in a semicircular form; whose dimensions are 60 feet long within, 25 broad; the foundations are eight or nine feet thick, and eight feet high from the foundation to the spring of the arch; the floor is two feet from the ground, which keeps it from dampness.

One of our engineers of great experience some time since had observed, that after the centres of semicircular arches are struck, they settle at the crown and rise up at the hances, even with a straight horizontal extrados, and still much more so in powder-magazines, whose outside at top is formed like the roof of a house, by two inclined planes joining in an angle over the top of the arch, to give a proper descent to the rain; which effects are exactly what might be expected agreeable to the true theory of arches. Now, as this shrinking of the arches must be attended with very ill consequences, by breaking the texture of the cement after it has been in some degree dried, and also by opening the joints of the voussiors at one end, so a remedy is pro-

vided for this inconvenience with regard to bridges, by the arch of equilibration in Mr Hutton's book on bridges; but as the ill effect is much greater in powder-magazines, the same ingenious gentleman proposed to find an arch of equilibration for them also, and to construct it when the span is 20 feet, the pitch or height 10, (which are the same dimensions as the semicircle), the inclined exterior walls at top forming an angle of 113 degrees, and the height of their angular point above the top of the arch equal to seven feet. This very curious question was answered in 1775, by the reverend Mr Wildbore, to be found in Mr Hutton's *Miscellanea Mathematica*.

*Artillery-MAGAZINE*. In a siege, the magazine is made about 25 or 30 yards behind the battery, towards the parallels, and at least three feet underground, to hold the power, loaded shells, port fires, &c. Its sides and roof must be well secured with boards to prevent the earth from falling in: a door is made to it, and a double trench or passage is sunk from the magazine to the battery, one to go in and the other to come out at, to prevent confusion. Sometimes traverses are made in the passages to prevent ricochet shot from plunging into them.

*MAGAZINE*, on ship-board, a close room or storehouse, built in the fore or after part of the hold, to contain the gun-powder used in battle. This apartment is strongly secured against fire, and no person is allowed to enter it with a lamp or candle: it is therefore lighted, as occasion requires, by means of the candles or lamps in the *light room* contiguous to it.

MAGDALEN, or *Nuns of St MAGDALEN*, an order of religious in the Romish church, dedicated to St Mary Magdalen, and sometimes called *Magdalenettes*. These consist chiefly of courtezans, who, quitting their profession, devote the rest of their lives to repentance and mortification.

MAGDALENA, one of the Marquesas islands, about five leagues in circuit, and supposed to be in S. Lat. 10. 25. W. Long. 138. 50. It was only seen at nine leagues distance by those who discovered it.

MAGDALENE'S CAVE, a cave of Germany, and in Carinthia, 10 miles east of Gortz. It appears like a chasm in a rock, and at the entrance torches are lighted to conduct travellers. It is divided into several apartments, or halls, with a vast number of pillars formed by nature, which give it a beautiful appearance, they being as white as snow, and almost transparent. The bottom is of the same substance, inasmuch that a person may fancy himself to be walking among the ruins of an enchanted castle, surrounded with magnificent pillars, some entire and others broken.

MAGDEBURG, a duchy of Germany, in the circle of Lower Saxony; bounded on the north by the duchy of Mecklenburg, on the south and south-west by the principality of Anhalt and Halberstadt, on the east by Upper Saxony with part of Brandenburg, and on the west by the duchy of Wolfenbuttel. The Saale circle, and that of Luxkenwalde, are separated from the rest, and surrounded on all sides by a part of Upper Saxony. This country is, for the most part, level; but sandy, marshy, or overgrown with woods. There are salt springs in it so rich, that they

Magazine  
Magdeburg

MAGDEBURG, a city of Germany, in a duchy of the same name, of which it is not only the capital, but that of all Lower Saxony, and formerly even of all Germany. It stands on the Elbe, in E. Long. 12. 9. N. Lat. 52. 16. It is a city of great trade, strongly fortified, and very ancient. Its name signifies *the maiden city*; which, some imagine, took its rise from the temple of Venus, which is said to have stood here anciently, and to have been destroyed by

Charlemagne. The founder of the city is supposed to have been Otho I. or his empress Editha, daughter to Edmund the Saxon king of England. The same emperor founded a Benedictine convent here, which he afterwards converted into an archbishopric, of which the archbishop was a count-palatine, and had very great privileges, particularly that of wearing the archiepiscopal pallium, and having the cross borne before him, besides many others. The first tournament in Germany is said to have been appointed near this city, by the emperor Henry the Fowler; but these pastimes were afterwards abolished, because they occasioned such envy and animosity among the nobility, that several of them killed one another upon the spot. The situation of the city is very convenient and pleasant, upon the banks of the Elbe, amidst spacious fruitful plains, and on the road betwixt High and Low Germany. It has been a great sufferer by fires and sieges; but by none so much as that in 1631, when the emperor's general, count Tilly, took it by storm, plundered and set it on fire, by which it was entirely reduced to ashes, except the cathedral, the convent of our Lady, and a few cottages belonging to fishermen; of 40,000 burghers not above 400 escaping. The soldiers spared neither age nor sex; but ripped up women with child, murdered sucking infants in sight of their parents, and ravished young women in the streets; to prevent which violation, many of them flung themselves into the Elbe, and others into the fire. The city is now populous, large, and well built, particularly the broad street and cathedral-square. The principal buildings are the king's palace, the governor's house, the armoury, guild-hall, and cathedral. The last is a superb structure in the antique taste, dedicated to St Maurice, which has a fine organ, the master-pipe of which is so big, that a man can scarce clasp it with both arms; it also contains the tombs of the emperor Otho, and the empress Editha; a fine marble statue of St Maurice, a porphyry font, an altar in the choir of one stone of divers colours, curiously wrought, and many other curiosities. They shew here a bedstead and table which belonged to Martin Luther, when he was an Augustine friar in a cloister of this city before the Reformation. Among the reliques, they pretend to have the basin in which Pilate washed his hands after his condemnation of our Saviour; the lantern which Judas made use of when he apprehended him; and the ladder on which the cock crowed after St Peter denied him. The chapter consists of a provost, 16 major, and seven minor canons; besides which, there are four other Lutheran collegiate foundations, and a Lutheran convent dedicated to our Lady, in which is a school or seminary. Here is also a gymnasium, with an academy, in which young gentlemen are instructed in the art of war. The canons of the chapter, which, except the change of religion, is upon the same footing as before the Reformation, must make proof of their nobility. The prebends and dignities are all in the gift of the elector; and the revenue of the provost is computed at 12,000 crowns a-year. Here is a great trade, and a variety of manufactures. The chief are those of woollen cloths and fluffs, silks, cottons, linen, stockings, hats, gloves, tobacco and snuff. The city was formerly one of the Hanse and

Magellan. imperial towns. Editha, consort to Otho I. on whom it was conferred as a dowry, among many other privileges and advantages, procured it the grant of a yearly fair. The bargrave of this city was anciently an office of great power; having the civil and criminal jurisdiction, the office of hereditary cup-bearer being annexed to it; and was long held as a fief of the archbishopric, but afterwards became an imperial fief, which was again conferred on the archbishopric by the elector of Saxony, upon certain conditions.

MAGELLAN (Ferdinand), a celebrated Portuguese mariner in the 16th century. He being dissatisfied with the king of Portugal, went into the service of the emperor Charles V. and sailed from Seville with five vessels in 1519, when he discovered and passed the strait to which he gave his own name, and sailed through the South Sea to the Ladrone Islands, when, according to some authors, he was poisoned in 1520; though others say that he was killed in a mutiny of his people, in the island of Mutan, on account of his severity. His voyage round the world was written by one on board, and has been frequently printed in English. His suddenly converting to the Christian religion people whose language was unknown to him, as his was to them, is an absurdity that discredits this work.

*Straits of MAGELLAN*, a narrow passage between the island of Terra del Fuego, and the southern extremity of the continent of America. This passage was first discovered by Ferdinand Magellan, who failed through it into the South Sea, and from thence to the East-Indies. Other navigators have passed the same way; but as these straits are exceedingly difficult, and subject to storms, it has been common to sail by Cape Horn, rather than through the Straits of Magellan. See *Straits Le MAIRE*, and *TERRA del Fuego*.

MAGGI (Jerome), in Latin *Magius*, one of the most learned men of the 16th century, was born at Anghiari in Tuscany. He applied himself to all the sciences, and even to the art of war; and distinguished himself so much in this last study, that the Venetians sent him into the island of Cyprus in quality of judge of the admiralty. When the Turks besieged Famagusta, he performed all the services that could be expected from the most excellent engineer: he invented mines and machines for throwing fire, by means of which he destroyed all the works of the besiegers, and in an instant overthrew what had cost the Turks infinite labour. But they had their revenge; for, taking the city in 1571, they plundered his library, carried him loaded with chains to Constantinople, and treated him in the most inhuman and barbarous manner. He nevertheless comforted himself from the example of Ætop, Menippus, Epictetus, and other learned men; and, after passing the whole day in the meanest drudgery, he spent the night in writing. He composed, by the help of his memory alone, treatises filled with quotations, which he dedicated to the Imperial and French ambassadors. These ministers, moved by compassion for this learned man, resolved to purchase him: but while they were treating for his ransom, Maggi found means to make his escape, and to get to the Imperial ambassador's house; when the Grand Vizir being enraged at his flight, and remembering

the great mischief he had done the Turks during the siege of Famagusta, sent to have him seized, and caused him to be strangled in prison in 1572. His principal works are, 1. A treatise on the bells of the ancients. 2. On the destruction of the world by fire. 3. Commentaries on Æmilius Probus's lives of illustrious men. 4. Commentaries on the institutes. These works are written in elegant Latin. He also wrote a treatise on fortification in Italian; and a book on the situation of ancient Tuscany.

He ought not to be confounded with his brother *Bartholomew Maggi*, a physician at Bologna, who wrote a treatise of gun-shot wounds; nor with *Vincent Maggi*, a native of Bresse, and a celebrated professor of humanity at Ferrara in Padua, who was the author of several works.

MAGGOT, the common name of the fly-worm bred in flesh, from the egg of the great blue flesh fly. Notwithstanding the distaste for this animal, its figure and structure of parts are greatly worth attending to; and may serve as a general history of the class of worms produced from the eggs of flies.

This animal is white and fleshy: its body is composed of a number of rings, like the bodies of caterpillars and other similar insects; and is capable, at the pleasure of the animal, of assuming different figures; being at times more or less extended in length, and consequently more or less thick.

Notwithstanding that this animal has no legs, it is able to move itself very swiftly; and in its first attempt to move its body, is extended to its greatest length, and assumes something of the figure of a pointed cone. The pointed part of this cone is the head of the animal, and is not separated from the next ring by any deeper furrow than the rest of the rings are from one another. In some states of the animal, one may see two short horns thrust out from the head; but more generally two scaly hooks are observable: these are, however, sometimes hid, and have each of them a case or sheath, into which the animal can retract them at pleasure. These hooks are bent into an arch, the concavity of which is towards the plane on which the creature is placed; and they are the thickest at their insertion in the head, and thence diminish gradually, till they terminate in a fine sharp point.

These two hooks are placed in a parallel direction, and can never come together, and therefore cannot serve in the place of teeth for grinding the food; but merely to pull and sever it in pieces, that it may be of a proper size for the mouth of the creature. Besides these hooks the maggot has a kind of dart, which is about a third part of their length, and is placed at an equal distance between them. This also is brown and scaly like them; it is quite straight, and terminates in a fine point. The hooks have as it were two scaly thorns at their points; and this dart seems intended, by reiterated strokes, to divide and break the pieces of flesh these have separated from the rest into smaller parts. Immediately below the apertures for the egress of the hooks, is placed the mouth of the animal; the creature does not shew this little opening unless pressed: but if the pressure is properly managed, it will sufficiently open it, and there may be discovered within it a small protuberance, which may very naturally be supposed either the tongue or the sucker of the animal.



mal. The hooks in these creatures not only supply the place of teeth, but also of legs; since it is by fastening these hooks into the substance it is placed on, and then drawing up its body to it, that it pulls itself along;

The back of this creature lowers itself by degrees as it approaches the extremity of the belly; and near the place where the back begins to lower itself, are placed the creature's two principal organs of respiration. One may perceive there two small roundish brown spots: they are very easily distinguishable by the naked eye, because the rest of the body of the creature is white; but if we take in the assistance of glasses, each of these spots appears to be a brown circular eminence raised a little above the rest of the body. On each of these spots one may also discover three oblong oval cavities, something of the shape of button-holes; these are situated in a parallel direction to one another, and their length nearly in a perpendicular direction to that of the body of the animal. These apertures are so many stigmata or air-holes; openings destined to admit the air necessary to the life of the animal. It has six of these stigmata, three in each side of its body.

The great transparency of the body of this animal gives us an opportunity also to distinguish that it has on each side a large white vessel running the whole length of the body. It is easy to follow the course of these vessels through their whole length, but they are most distinct of all towards its hinder part; and they are always seen to terminate each in the brown spot abovementioned: this leaves us no room to doubt that they are the two principal tracheæ.

The ramifications of the two great tracheæ are very beautifully seen in this creature; especially on its belly: and it is remarkable, that no vessel analogous to the great artery in the caterpillar class can be discovered in these; though, if there were any such, their great transparency must needs make them very easily distinguishable; nor could its dilatations and contractions, if so considerable as in that class of animals, be less so. See ERUCA.

Malpighi imagined that this artery in the caterpillar class was a series of hearts; in its place, however, there may be seen in these animals a true heart. It is easy to observe in these creatures, about the fourth ring of their body, a small fleshy part, which has alternate contractions and dilatations; and is not only discoverable in the body by means of its transparency, but on making a proper section of them in the second, third, and fourth, will be thrown out of the body of the creature, and continue its beats for some time afterwards.

MAGI, or MAGIANS, an ancient religious sect in Persia, and other Eastern countries, who maintained that there were two principles, one the cause of all good, the other the cause of all evil: and, abominating the adoration of images, they worshipped God only by fire; which they looked upon as the brightest and most glorious symbol of Oromasdes, or the good God; as darkness is the truest symbol of Arimanus, or the evil god. This religion was reformed by Zoroaster, who maintained that there was one supreme independent Being; and under him two principles or angels, one the angel of goodness and light, and the other of evil and darkness: that there is a perpetual struggle be-

tween them, which shall last to the end of the world; that then the angel of darkness and his disciples shall go into a world of their own, where they shall be punished in everlasting darkness; and the angel of light and his disciples shall also go into a world of their own, where they shall be rewarded in everlasting light.

The priests of the magi were the most skilful mathematicians and philosophers of the ages in which they lived; inasmuch that a learned man and a magician became equivalent terms. The vulgar looked on their knowledge as supernatural; and hence those who practised wicked and mischievous arts, taking upon themselves the name of *magians*, drew on it that ill significance which the word magician now bears among us.

This sect still subsists in Persia under the denomination of *gaurs*, where they watch the sacred fire with the greatest care, and never suffer it to be extinguished.

MAGIC, MAGIA, *MATEIA*, in its ancient sense, the science, or discipline and doctrine of the magi, or wise-men of Persia. See MAGI.

The origin of magic and the magi is ascribed to Zoroaster: Salmalius derives the very name from Zoroaster, who, he says, was surnamed *Mog*, whence *Magus*. Others, instead of making him the author of the Persian philosophy, make him only the restorer and improver thereof; alleging, that many of the Persian rites in use among the magi, were borrowed from the Zabii among the Chaldeans, who agreed in many things with the magi of the Persians; whence some make the name *magus* common both to the Chaldeans and Persians. Thus Plutarch mentions, that Zoroaster instituted magi among the Chaldeans, in imitation whereof the Persians had theirs too.

MAGIC, in a more modern sense, is a science which teaches to perform wonderful and surprising effects.

The word *magic* originally carried with it a very innocent, nay laudable, meaning; being used purely to signify the study of wisdom, and the more sublime parts of knowledge: but in regard the ancient magi engaged themselves in astrology, divination, sorcery, &c. the term *magic* in time became odious, and was only used to signify an unlawful and diabolical kind of science, depending on the assistance of the devil and departed souls.

If any wonder how so vain and deceitful a science should gain so much credit and authority over mens minds, Pliny gives the reason of it. It is, says he, because it has possessed itself of three sciences of the most esteem among men; taking from each, all that is great and marvellous in it. Nobody doubts but it had its first origin in medicine; and that it insinuated itself into the minds of the people, under pretence of affording extraordinary remedies. To these fine promises it added every thing in religion that is pompous and splendid, and that appears calculated to blind and captivate mankind. Lastly, it mingled judiciary astrology with the rest; persuading people, curious of futurity, that it saw every thing to come in the heavens. Agrippa divides magic into three kinds; natural, celestial, and ceremonial or superstitious.

Natural MAGIC is no more than the application of natural active causes to passive subjects; by means whereof many surprising, but yet natural, effects are produced.

Baptista Porta has a treatise of natural magic, or of secrets for performing very extraordinary things by natural causes. The natural magic of the Chaldeans was nothing but the knowledge of the powers of simples and minerals. The magic which they called *theurgia*, consisted wholly in the knowledge of the ceremonies to be observed in the worship of gods, in order to be acceptable. By virtue of these ceremonies they believed they could converse with spiritual beings, and cure diseases.

*Celestial Magic*, borders nearly on judiciary astrology: it attributes to spirits a kind of rule or dominion over the planets, and to planets a dominion over men; and on those principles builds a ridiculous kind of system. See *ASTROLOGY*.

*Superstitious or Goetic Magic*, consists in the invocation of devils. Its effects are usually evil and wicked, though very strange and seemingly surpassing the powers of nature; supposed to be produced by virtue of some compact, either tacit or express, with evil spirits: but the truth is, these have not all the power that is usually imagined, nor do they produce those effects ordinarily ascribed to them.

Naude has published an apology for all the great men suspected of magic.—Agrippa says, that the words used by those in compact with the devil, to invoke him, and to succeed in what they undertake, are *Dies, mies, jesquet, benedoejet, douvima, enitemaus*. There are an hundred other superstitious formulas of words composed at pleasure, or gathered from several different languages, or patched from the Hebrew, or formed in imitation of it.

The most ignorant and barbarous people have been most generally suspected of magic. Among ourselves, the most miserably ignorant persons have been accused of it. Among foreigners, the Laplanders and Icelanders have been supposed most conversant of all others in it. These people themselves place an absolute confidence in the effects of certain idle words and actions; and the rest of the world is deceived in the same manner. The famous *magical drum* of the Laplanders is still in constant use in that nation; and Scheffer, in his history of Lapland, has given an account of its structure.

This instrument is made of beech, pine, or fir, split in the middle, and hallowed on the flat side where the drum is to be made. The hollow is of an oval figure; and is covered with a skin clean dressed, and painted with figures of various kinds, such as stars, suns and moons, animals and plants, and even countries, lakes and rivers; and of latter days, since the preaching of Christianity among them, the acts and sufferings of our Saviour and his apostles are often added among the rest. All these figures are separated by lines into three regions or clusters.

There is, besides these parts of the drum, an index and a hammer. The index is a bundle of brass or iron rings, the biggest of which has a hole in its middle, and the smaller ones are hung to it. The hammer or drumstick is made of the horn of a rein-deer; and with this they beat the drum so as to make these rings move, they being laid on the top for that purpose. In the motion of these rings about the pictures figured on the drum, they fancy to themselves some prediction in regard to the things they inquire about.

What they principally inquire into by this instrument, are three things. 1. What sacrifices will prove most acceptable to their gods. 2. What success they shall have in their several occupations, as hunting, fishing, curing of diseases, and the like; and, 3. What is doing in places remote from them. On these several occasions they use several peculiar ceremonies, and place themselves in various odd postures as they beat the drum; which influences the rings to the one or the other side, and to come nearer to the one or the other set of figures. And when they have done this, they have a method of calculating a discovery, which they keep as a great secret, but which seems merely the business of the imagination in the diviner or magician.

*Magic-Square*, a square figure formed of a series of numbers in arithmetical proportion, so disposed in parallel and equal ranks, as that the sums of each row, taken either perpendicularly, horizontally, or diagonally, are equal.

The several numbers which compose any square number, (for instance, 1, 2, 3, 4, 5, &c. to 25 inclusive, which compose the square number 25), being disposed after each other in a square figure of 25 cells, each in its cell: if then you change the order of these numbers, and dispose them in the cells, in such manner, as that the five numbers which fill an horizontal rank of cells, being added together, shall make the same sum with the five numbers in any other rank of cells, whether horizontal or vertical; and even the same number with the five in each of the two diagonal ranks; this disposition of numbers is called a *magic-square*, in opposition to the former disposition, which is called a *natural square*.

Natural Square.

|    |    |    |    |    |
|----|----|----|----|----|
| 1  | 2  | 3  | 4  | 5  |
| 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 |

Magic-Square.

|    |    |    |    |    |
|----|----|----|----|----|
| 16 | 14 | 8  | 2  | 25 |
| 3  | 22 | 20 | 11 | 9  |
| 15 | 6  | 4  | 33 | 17 |
| 24 | 18 | 12 | 10 | 1  |
| 7  | 5  | 21 | 19 | 13 |

One would imagine that magic squares had that name given them in regard this property of all their ranks, which, taken any way, make always the same sum, appeared extremely surprising, especially in certain ignorant ages, when mathematics passed for magic. But there is a great deal of reason to suspect, that these squares merited their name still further by the superstitious operations they were employed in, as the construction of talismans, &c. For according to the childish philosophy of those days, which attributed virtues to numbers, what virtues might not be expected from numbers so wonderful?

However, what was at first the vain practice of makers of talismans and conjurers, has since become the subject of a serious research among mathematicians: not that they imagine it will lead them to any thing of solid use or advantage; magic squares favour too much of their original, to be of much use: but only as it is a kind of play, where the difficulty makes the merit; and as it may chance to produce some new views

of numbers which mathematicians will not lose the occasion of.

MAGIC LANTERN. See DIOPTRICS, art. ix. p. 2478.

MAGICIAN, one who practises magic, or hath the power of doing wonderful feats by the agency of spirits.

Among the Eastern nations it seems to have been formerly common for the princes to have magicians about their court to confer with upon extraordinary occasions. And concerning these there hath been much dispute: some supposing that their power was only feigned, and that they were no other than impostors who imposed on the credulity of their sovereigns; while others have thought that they really had some unknown connection or correspondence with evil spirits, and could by their means accomplish what otherwise would have been impossible for men. The greatest difficulty is with regard to the magicians of Egypt, by St Paul called *Jannes* and *Jambres*, who opposed Moses and Aaron. From the account given of them in Scripture, it would seem that they had the art either of performing or counterfeiting certain miraculous actions, while others, seemingly as easy, they could neither perform nor counterfeit.

A very learned author tells us, that the origin of these magicians seems to have been this, That as God admitted the holy patriarchs to a familiar intercourse with him, so the devil kept men in obedience to him by pretending to discover secret things to them: and when God was pleased to work miracles to confirm the truth, the devil directed the latter how to invoke him for the performance of strange things, which confirmed them in their error.

With regard to the enchantments which they are said to make use of, if the Hebrew word came from *lahat*, a "flame," (Gen. iii. 24.), it shews that they dazzled men's eyes, and imposed upon them by false appearances. But it may be derived from *la'at*, "hidden, or secret;" and so intimate to us, that they used secret whispers or murmurs, as enchanters did who were familiar with demons; and thus it is explained in Gemara sanhedrim.

A late learned and ingenious writer has obliged the public with several very curious remarks upon this subject, of the Egyptian magicians succeeding in several of their attempts to work miracles. He is not of the opinion that these wonders could possibly be done by any or all the powers of nature; nor does he agree with some authors, who imagine there was not any real transmutation, but that they played their parts as jugglers, pretending to do what they did not, or that some demons assisted them to deceive the sight of the beholders. For with regard to their imposing upon Pharaoh by artifice and pretence, this must inevitably have given Moses and Aaron an opportunity of detecting their imposture. And as to their being able to exhibit the appearances of serpents, frogs, and blood, when no such things were really in being, either by themselves or by the assistance of demons; this supposes them to have performed wonders, of which we can give as little account as of a miracle. But the question will recur, If they had no mystical arts to perform these things, how came they to succeed in the attempts which they made in opposition to Moses? To this our author replies, 1. That we have no reason to

think that the king knew that the works which he employed them to perform were within the reach of their art; but rather, on the contrary, he ordered them to try to perform them, that he might know whether art could effect them or not, or whether they were true miracles. 2. That it does not appear from the magicians here trying the experiments, and succeeding in them, that they thought at first their arts would be effectual: but, they would try all experiments in order to judge further of the matter; and, upon their attempting, God was pleased in some cases to give an unexpected success to their endeavours, in order to serve his purposes by it. For, 3. Their success was certainly unexpected, as evidently appears by their not being able to follow Moses in all his miracles. When they attempted to produce the lice, they could not do it. It is here evident the magicians did not know the extent of their powers, if they can be conceived to have had any: for they attempted to equal Moses in all his performances; but upon trial they found they could do some, whereas in others, though not a whit more difficult, they could not obtain any success at all. Had they had any effectual rules of art or science to work by, they would at first, without trial, have known what to attempt, and what not; but, in truth, they had no arts to perform any thing of this sort. In some instances, God was pleased to give a success, which they little expected, to their endeavours, and which they were so far from resting satisfied with, that they took the first opportunity which was given them, when their attempts failed, to acknowledge that Moses was certainly assisted by the divine power.

MAGISTRY, in chemistry, a name given to almost all precipitates. Thus, *magistry* and *precipitate* are synonymous; but lately, chemists have used chiefly the term *precipitate*, and applied that of *magistry* to some particular precipitates only, which are used in medicine and in the arts. Such are, the magisteries of bismuth, coal, crabs-eyes, sulphur, &c.

MAGISTRY of Bismuth. See CHEMISTRY, n° 209.

MAGISTRATE, any public officer, to whom the executive power of the law is committed either wholly or in part.

MAGLIABECCHI (Antony), a person of great learning, and remarkable for an amazing memory, was born at Florence in 1633. His father died when he was only seven years old. His mother had him taught grammar and drawing, and then put him apprentice to one of the best goldsmiths in Florence. When he was about 16 years old, his passion for learning began to shew itself; and he laid out all his money in buying books. Becoming acquainted with Michael Ermini, librarian to the cardinal de Medicis, he soon perfected himself by his assistance in the Latin tongue, and in a little time became master of the Hebrew. His name soon became famous among the learned. A prodigious memory was his distinguishing talent; and he retained not only the sense of what he had read, but frequently all the words, and the very manner of spelling. It is said that a gentleman, to make trial of the force of his memory, lent him a manuscript he was going to print. Some time after it was returned, the gentleman, coming to him with a melancholy countenance, pretended it was lost, and requested Magliabechi to recollect what he remembered of it; upon which



which he wrote the whole, without missing a word. He generally shut himself up the whole day, and opened his doors in the evening to the men of letters who came to converse with him. His attention was so absorbed by his studies, that he often forgot the most urgent wants of nature. Cosmo III. grand duke of Florence, made him his librarian; but he still continued negligent in his dress, and simple in his manners. An old cloak served him for a morning-gown in the day, and for bed-clothes at night. The duke, however, provided for him a commodious apartment in his palace, which he was with difficulty persuaded to take possession of; but which he quitted four months after, and returned to his house. He was remarkable for his extraordinary modesty, his sincerity, and his beneficence, which his friends often experienced in their wants. He was a patron of men of learning; and had the highest pleasure in assisting them with his advice and information, and in furnishing them with books and manuscripts. He had the utmost aversion to any thing that looked like constraint; and therefore the grand duke always dispensed with his personal attendance, and sent him his orders in writing. Though he lived a most sedentary life, he reached the 81st year of his age; and died in the midst of the public applause, after enjoying, during the latter part of his life, such assistance as few have ever procured by their learning. By his will, he left a very fine library to the public, with a fund for its support.

MAGNA ASESISA ELIGENDA, is a writ anciently directed to the sheriff for summoning four lawful knights before the justices of assize, in order to choose 12 knights of the neighbourhood, &c. to pass upon the great assize between such a person plaintiff and such a one defendant.

MAGNA Charta, the great charter of the liberties of Britain, and the basis of our laws and privileges.

This charter may be said to derive its origin from king Edward the Confessor, who granted several privileges to the church and state by charter: these liberties and privileges were also granted and confirmed by king Henry I. by a celebrated great charter now lost; but which was confirmed or re-enacted by king Henry II. and king John. Henry III. the successor of this last prince, after having caused 12 men make inquiry into the liberties of England in the reign of Henry I. granted a new charter; which was the same as the present magna charta. This he several times confirmed, and as often broke; till, in the 37th year of his reign, he went to Westminster-hall, and there, in presence of the nobility and bishops, who held lighted candles in their hands, magna charta was read, the king all the time holding his hand to his breast, and at last solemnly swearing faithfully and inviolably to observe all the things therein contained, &c. Then the bishops extinguishing the candles, and throwing them on the ground, they all cried out, "Thus let him be extinguished, and stink in hell, who violates this charter." It is observed, that, notwithstanding the solemnity of this confirmation, king Henry, the very next year, again invaded the rights of his people, till the barons entered into a war against him; when, after various success, he confirmed this charter, and the charter of the forest, in the 52d year of his reign.

This charter confirmed many liberties of the church, and redressed many grievances incident to feudal tenures, of no small moment at the time; tho' now, unless considered attentively and with this retrospect, they seem but of trifling concern. But, besides these feudal provisions, care was also taken therein to protect the subject against other oppressions, then frequently arising from unreasonable amercements, from illegal distresses or other process for debts or services due to the crown, and from the tyrannical abuse of the prerogative of purveyance and pre-emption. It fixed the forfeiture of lands for felony in the same manner as it still remains; prohibited for the future the grants of exclusive fisheries; and the erection of new bridges so as to oppress the neighbourhood. With respect to private rights, it established the testamentary power of the subject over part of his personal estate, the rest being distributed among his wife and children; it laid down the law of dower, as it hath continued ever since; and prohibited the appeals of women, unless for the death of their husbands. In matters of public police and national concern, it enjoined an uniformity of weights and measures; gave new encouragements to commerce, by the protection of merchant-francigers; and forbade the alienation of lands in mortmain. With regard to the administration of justice: besides prohibiting all denials or delays of it, it fixed the court of common-pleas at Westminster, that the suitors might no longer be harassed with following the king's person in all his progresses; and at the same time brought the trial of issues home to the very doors of the freeholders, by directing assises to be taken in the proper counties, and establishing annual circuits: it also corrected some abuses then incident to the trials by wager of law and of battle; directed the regular awarding of inquests for life or member; prohibited the king's inferior ministers from holding pleas of the crown, or trying any criminal charge, whereby many forfeitures might otherwise have unjustly accrued to the exchequer; and regulated the time and place of holding the inferior tribunals of justice, the county-court, sheriff's torn, and court-leet. It confirmed and established the liberties of the city of London, and all other cities, boroughs, towns, and ports of the kingdom. And lastly, (which alone would have merited the title that it bears, of the *great charter*) it protected every individual of the nation in the free enjoyment of his life, his liberty, and his property, unless declared to be forfeited by the judgment of his peers or the law of the land.

This excellent charter, so equitable, and beneficial to the subject, is the most ancient written law in the kingdom. By the 25th Edward I. it is ordained, that it shall be taken as the common law; and by the 43d Edward III. all statutes made against it are declared to be void.

MAGNESA, or MAGNESIA, (anc. geog.) a town or a district of Thessaly, at the foot of mount Peli-  
us, called by Philip, the son of Demetrius, one of the three keys of Greece, (Pausanias).

MAGNESA ALBA, a white earth procured from the mother-liquors of nitre, or sea-salt, by precipitation with a fixed alkali, and afterwards washing of the salt with water. See CHEMISTRY, n° 37.

Magnesia alba is a good absorbent; and undoubted-  
ly

**Magnesia**. ly to be preferred to crab's eyes, on account of its purgative quality when united with an acid, which the other has not. It has been esteemed hurtful in bilious habits where there is a disposition in the stomach contrary to acidity. This, however, according to Mr Henry, is doubtful: and where putrid bile is to be corrected, he thinks good purposes may be answered by taking magnesia with an acid in a state of effervescence; as the fixed air, thus extricated, will correct the putridity of the contents of the intestines, while they are at the same time evacuated downwards. He is also of opinion, that in cutaneous diseases it may enter the circulation in form of a neutral salt, and, by acting as a diaphoretic and diuretic, prove an excellent alterative.

For some medical purposes, magnesia is used in a calcined state; in which case it is deprived of its fixed air, and then it proves nearly as aperient as a double quantity of magnesia in its uncalcined state. Mr Henry is of opinion, that it may be useful in distensions of the bowels arising from flatus; that it may be successfully employed as a cathartic with patients labouring under the stone, who are using the lixivium saponaceum; and that, joined with warm aromatics, it may be of service in correcting the great flatulency which so much afflicts people of a gouty disposition. From several experiments made by the same author, it also appears that magnesia has a considerable antiseptic power. The like virtue he ascribes to all kinds of testaceous powders: from whence he concludes, that medicines of this kind are by no means improper in fevers of a putrescent type; that where bile is suspected to be the cause of any putrid disease, those antiseptics should be prescribed which particularly impede its corruption; that, as calcined magnesia is a more powerful antiseptic than most other absorbents, it merits a preference to these; and that where an acid cacochymy prevails, magnesia or other absorbents, taken immediately before or after meal-time, may, by increasing the putrefactive fermentation of animal-food, be of very great service. He hath also found, that magnesia hath a power of promoting the solution of resinous gums in water; and thus we have an elegant and easy method of preparing aqueous tinctures from these substances. Such tinctures, however, are calculated only for extemporaneous prescription, as most of them deposit a sediment when they have been kept a week or two.

**MAGNESIA**, (anc. geog.), a maritime district of Thessaly, lying between the fourth part of the Sinus Thermæicus and the Pagææus to the south, and to the east of the Pelagiæotis. *Magnetæ*, the people. *Magnæsius* and *Magnæsius*, the epithet, (Horace).

**MAGNESIA ad Alæandrum**, (anc. geog.), a town of Ionia, on the Meander, to distinguish it from another Magnesia at the foot of mount Sipylus. The former was one of the three towns given to Themistocles by Artaxerxes, with these words, *to furnish his table with bread*. A colony from the Magnesia of Thessaly, (Pliny); from Delphi, (Athenæus); from Lacedæmon, (Velleius); distant 15 miles from Ephesus to the east, (Pliny). It did not stand immediately on the Meander, being nearer the river Letæus, which runs into the Meander, (Strabo). It is sometimes

mentioned without its distinguishing surname, as being more considerable than the other Magnesia, which is scarce ever without its surname *ad Sipylum*. *Magnetæ*, the people.

**MAGNESIA ad Sipylum**, (anc. geog.), anciently *Tantalæ*, the residence of Tantalus, and capital of Mæonia, where now stands the lake Sale. A town of Lydia, at the foot of mount Sipylus, to the east of the Hermus; adjudged free under the Romans; destroyed by earthquakes. (Strabo).

**MAGNET**, **MAGNES**, the *Loadstone*; a sort of ferruginous stone, in weight and colour resembling iron ore, though somewhat harder and more heavy; endued with divers extraordinary properties, attractive, directive, inclinatory, &c. See **MAGNETISM**.

The magnet is also called *Lapis Heracleus*, from Heraclea, a city of Magnesia, a port of the ancient Lydia, where it is said to have been first found, and from which it is usually supposed to have taken its name. Though others derive the word from a shepherd named *Magnet*, who first discovered it with the iron of his crook on mount Ida. It is also called *lapis nauticus*, by reason of its use in navigation; and *siderites*, from its attracting iron, which the Greeks call *sideron*.

The magnet is usually found in iron mines, and sometimes in very large pieces, half magnet, half iron. Its colour is different, according to the different countries it is brought from. Norman observes, that the best are those brought from China and Bengal, which are of an iron or sanguine colour; those of Arabia are reddish; those of Macedonia blackish; and those of Hungary, Germany, England, &c. the colour of unwrought iron. Neither its figure nor bulk are determined, but it is found of all forms and sizes.

The ancients reckoned five kinds of magnets different in colour and virtue: the *Æthiopic*, *Magnesian*, *Boeotic*, *Alexandrian*, and *Natolian*. They also took it to be male and female: but the chief use they made of it was in medicine; especially for the cure of burns, and defluxions on the eyes.—The moderns, more happy, take it to conduct them in their voyages. See **NAVIGATION**.

The most distinguishing properties of the magnet are, That it attracts iron, and that it points to the poles of the world; and in other circumstances also dips or inclines to a point beneath the horizon, directly under the pole; and that it communicates these properties, by touch, to iron. On which foundation are built the mariner's needles, both horizontal, and inclinatory or dipping needles.

*Attractive Power of the MAGNET* was known to the ancients, and is mentioned even by Plato and Euripides, who call it the *Heracleian stone*, because it commands iron, which subdues every thing else: but the knowledge of its directive power, whereby it disposes its poles along the meridian of every place, and occasions needles, pieces of iron, &c. touched with it, to point nearly north and south, is of a much later date; though the exact time of its discovery, and the discoverer himself, are yet in the dark. The first tidings we hear of it is in 1250, when Marco Polo the Venetian is said by some to have introduced the mariners compass; tho' not as an invention of his own, but as derived

ved from the Chinese, who are said to have had the use of it long before; tho' some imagine that the Chinese rather borrowed it from the Europeans.

Flavio de Gioia, a Neapolitan, who lived in the 13th century, is the person usually supposed to have the best title to the discovery: and yet Sir G. Wheeler mentions, that he had seen a book of astronomy much older, which supposed the use of the needle; though not as applied to the uses of navigation, but of astronomy. And in Guyot de Provins, an old French poet, who wrote about the year 1180, there is an express mention made of the loadstone and the compass; and their use in navigation obliquely hinted at.

*The Variation of the Magnet*, or its declination from the pole, was first discovered by Seb. Cabot, a Venetian, in 1500; and the variation of that variation, by Mr Gellibrand, an Englishman, about the year 1625. See VARIATION.

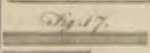
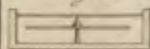
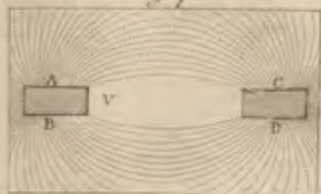
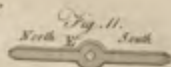
Lastly, the dip or inclination of the needle, when at liberty to play vertically, to a point beneath the horizon, was first discovered by another of our countrymen, Mr R. Norman, about the year 1576. See the article *Dipping-NEEDLE*.

*Phænomena of the MAGNET.* 1°. In every magnet there are two poles, one whereof points northwards, the other southwards; and if the magnet be divided into ever so many pieces, the two poles will be found in each piece. The poles of a magnet are found by holding a very fine short needle over it; for where the poles are, the needle will stand upright, but nowhere else. 2°. These poles in different parts of the globe, are differently inclined towards a point under the horizon. 3°. These poles, though contrary to one another, do help mutually towards the magnet's attraction and suspension of iron. 4°. If two magnets be spherical, one will turn or conform itself to the other, so as either of them would do to the earth; and after they have so conformed or turned themselves, they endeavour to approach or join each other; but if placed in a contrary position, they avoid each other. 5°. If a magnet be cut through the axis, the parts or segments of the stone, which before were joined, will now avoid and fly each other. 6°. If the magnet be cut by a section perpendicular to its axis, the two points, which before were conjoined, will become contrary poles; one in one, the other in the other segment. 7°. Iron receives virtue from the magnet by application to it, or barely from an approach near it, though it do not touch it; and the iron receives this virtue variously, according to the parts of the stone it is made to touch, or even approach to. 8°. If an oblong piece of iron be any how applied to the stone, it receives virtue from it only as to its length. 9°. The magnet loses none of its own virtue by communicating any to the iron; and this virtue it can communicate to the iron very speedily: though the longer the iron touches or joins the stone, the longer will its communicated virtue hold; and a better magnet will communicate more of it, and sooner, than one not so good. 10°. Steel receives virtue from the magnet better than iron. 11°. A needle touched by a magnet will turn its ends the same way towards the poles of the world, as the magnet itself does. 12°. Neither loadstone nor needles touched by it do conform their poles exactly to those of the world, but have

usually some variation from them: and this variation is different in divers places, and at divers times in the same place. 13°. A loadstone will take up much more iron when armed or capped than it can alone. And though an iron ring or key be suspended by the loadstone, yet the magnetical particles do not hinder that ring or key from turning round any way, either to the right or left. A loadstone is said to be armed, when its poles are surrounded with plates of steel. To determine the quality of steel to be applied, try the magnet with several steel bars; and the greatest weight it takes up, with a bar on, is to be the weight of its armour. 14°. The force of a loadstone may be variously increased or lessened by the various application of iron, or another loadstone, to it. 15°. A strong magnet at the least distance from a lesser or a weaker, cannot draw to it a piece of iron adhering actually to such lesser or weaker stone; but if it come to touch it, it can draw it from the other: but a weaker magnet, or even a little piece of iron, can draw away or separate a piece of iron contiguous to a greater or stronger loadstone. 16°. In these northern parts of the world, the south pole of a loadstone will raise up more iron than the north pole. 17°. A plate of iron only, but no other body interposed, can impede the operation of the loadstone, either as to its attractive or directive quality. Mr Boyle found it true in glasses sealed hermetically; and glass is a body as impervious as most are to any effluvia. 18°. The power or virtue of a loadstone may be impaired by lying long in a wrong position, as also by rust, wet, &c. and may be quite destroyed by fire. 19°. A piece of iron-wire well touched, will, upon being bent round in a ring, or coiled round on a stick, &c. generally, quite lose its directive virtue, but always have it much diminished; and yet if the whole length of the wire were not entirely bent, so that the ends of it, though but for the length of one tenth of an inch, were left straight, the virtue will not be destroyed in those parts; though it will in all the rest. This was first observed by Grimaldi and de la Hire; and is confirmed by the experiments of Mr Derham; who adds further, that though coiling or bending the wire as above, would always destroy its virtue by day, yet it would not do it in the evening. 20°. This sphere of the activity of magnets is greater and less at different times: in particular, that reserved in the repository of the royal society will keep a key or other body suspended to another, sometimes, at the height of eight or ten feet; and at others, not above four feet. To which we may add, that the variation of the magnetical needle from the meridian, varies at various times of the day; as appears from some experiments of Mr Graham, and likewise from observations made during one of Capt Cook's voyages. See VARIATION. 21°. By twisting a piece of wire touched with a magnet, its virtue is exceedingly diminished; and sometimes so disordered and confused, that in some parts it will attract, and in others repel; and even, in some places, one side of the wire seems to be attracted, and the other side repelled, by one and the same pole of the stone. 22°. A piece of wire that has been touched, being split, or cleft in two, the poles are sometimes changed, as in a cleft magnet; the north becoming the south, and the south the north: and yet some-







Magnet. sometimes one half of the wire will retain its former poles, and the other half will have them changed. To which it may be added, that laying one or other side of the half uppermost, causes a great alteration in its tendency or aversion to the poles of the magnet. 23°. A wire being touched from end to end with the same pole of the magnet, the end whereat you begin will always turn contrary to the pole which touched it: if it be again touched the same way with the other pole of the magnet, it will then be turned the contrary way. 24°. If a piece of wire be touched in the middle with only one pole of the magnet, without moving it backwards or forwards; in that place will be the pole of the wire, and the two ends will be the other pole. 25°. If a magnet be heated red hot, and again cooled either with its south pole towards the north in a horizontal position, or with its south pole downwards in a perpendicular position, its poles will be changed. 26°. Mr Boyle (to whom we are indebted for the following magnetical phenomena) found he could presently change the poles of a small fragment of a loadstone, by applying them to the opposite vigorous ones of a large magnet. 27°. Hard iron tools well tempered, when heated by a brisk attrition, as filing, turning, &c. will attract thin filings or chips of iron, steel, &c. and hence we observe files, punches, augers, &c. to have a small degree of magnetic virtue. 28°. The iron-bars of windows, &c. which have a long time stood in an erect position, grow permanently magnetical; the lower ends of such bars being the north-pole, and the upper the southern. 29°. A bar of iron that has not stood long in an erect posture, if it be only held perpendicularly, will become magnetical, and its lower end the north pole, as appears from its attracting the south pole of a needle: but then this virtue is transient, and by inverting the bar the poles will shift their places. In order therefore to render the quality permanent in an iron bar, it must continue a long time in a proper position. But the fire will produce the effect in a short time: for as it will immediately deprive a loadstone of its attractive virtue; so it soon gives a verticity to a bar of iron, if, being heated red hot, it be cooled in an erect posture, or directly north and south. Nay, tongs and fire-forks, by being often heated and set to cool again in a posture nearly erect, have gained this magnetical property. Sometimes iron bars, by long standing in a perpendicular position, have acquired the magnetic virtue in a surprising degree. A bar about 10 feet long, and three inches thick, supporting the summer-beam of a room, was able to turn the needle at eight or ten feet distance, and exceeded a loadstone of three and an half pounds weight. From the middle point upwards it was a north pole, and downwards a south pole; and Mr Martin mentions a bar, which had been the beam of a large steel-yard, that had several poles in it. 30°. Mr Boyle found, that by heating a piece of English oker red-hot, and placing it to cool in a proper posture, it manifestly acquired a magnetic virtue. And an excellent magnet of the same ingenious gentleman's having lain near a year in an inconvenient posture, had its virtue surprisingly impaired, as if it had been by fire. 31°. A needle well touched, it is known, will point north and south: if it have one contrary touch of the same stone, it will be deprived of its faculty; and by another such touch will have its poles quite changed. 32°. If a bar of iron have gained a verticity by being heated red-hot and cooled again, north and south, and then hammered at the two ends; its virtue will be destroyed by two or three smart blows on the middle. 33°. By drawing the back of a knife, or long piece of steel-wire, &c. leisurely over the pole of a loadstone; carrying the motion from the middle of the stone to the pole, the knife or wire will accordingly attract one end of a needle; but if the knife or wire be passed from the said pole to the middle of the stone, it will repel that end of the needle which in the other case it attracts. 34°. Either a magnet or a piece of iron being laid on a piece of cork, so as to swim freely in water; it will be found, that, whichever of the two is held in the hand, the other will be drawn to it: so that iron attracts the magnet as much as it is attracted by it; action and re-action being always equal. In this experiment, if the magnet be set afloat, it will direct its two poles to the poles of the world. 35°. A knife, &c. touched with a magnet, acquires a greater or less degree of virtue, according to the part it is touched on. It receives the strongest touch, when it is drawn leisurely from the handle towards the point over one of the poles: And if the same knife thus touched, and thus in possession of a strong attractive power, be retouched in a contrary direction, viz. by drawing it from the point towards the handle over the same pole, it immediately loses all its virtue. 36°. A magnet ads with equal force *in vacuo* and in the open air. 37°. The smallest magnets have generally the greatest power in proportion to their bulk. A large magnet will seldom take up above three or four times its own weight, whereas a small one will frequently take up more than ten times its weight. A magnet worn by Sir Isaac Newton in a ring, and which weighed only three grains, would take up 746 grains, or almost 250 times its own weight. A magnetic bar made by Mr Canton, according to the method described in the next article, and which weighed 10 ounces 12 penny-weights, took up something more than 79 ounces; and a flat semicircular steel magnet that weighed an ounce and 13 penny-weights took up an iron wedge of 90 ounces.

*Artificial MAGNET*, is a term usually applied to steel bars impregnated with the virtues of the natural magnet or loadstone; and are much more common, as well as more convenient for use, than the others.

The late Dr Godwin Knight possessed a surprising skill in magnetism, being able to communicate an extraordinary degree of attractive or repulsive virtue, and to alter or reverse the poles at pleasure; but as he refused to discover his methods upon any terms whatever, (even, as he said, though he should receive in return as many guineas as he could carry) these curious and valuable secrets have died with him. In the 69th volume of the Philosophical Transactions, however, Mr Benjamin Wilson hath given a process which at least discovers one of the leading principles of Dr Knight's art, and may perhaps be a means of discovering the whole to those who shall be less reserved. The doctor's process, according to Mr Wilson, was as follows. Having provided himself with a great quantity of clean iron-filings, he put them into a large tub that was more than one third filled with



Magnet.

Magnet.

clean water; he then, with great labour, worked the tub to and fro for many hours together, that the friction between the grains of iron by this treatment might break off such smaller parts as would remain suspended in the water for a time. The obtaining of these very small particles in sufficient quantity seemed to him to be one of the principal desiderata in the experiment. The water being by this treatment rendered very muddy, he poured the same into a clean iron vessel, leaving the filings behind; and when the water had stood long enough to become clear, he poured it out carefully, without disturbing such of the sediment as still remained, which now appeared reduced almost to impalpable powder. This powder was afterwards removed into another vessel in order to dry it; but as he had not obtained a proper quantity thereof by this one step, he was obliged to repeat the process many times. Having at last procured enough of this very fine powder, the next thing was to make a paste of it, and that with some vehicle which would contain a considerable quantity of the phlogistic principle: for this purpose, he had recourse to linseed oil in preference to all other fluids. With these two ingredients only he made a stiff paste, and took particular care to knead it well before he moulded it into convenient shapes. Sometimes, while the paste continued in its soft state, he would put the impression of a seal upon the several pieces; one of which is in the British museum. This paste was then put upon wood, and sometimes on tiles, in order to bake or dry it before a moderate fire, at about the distance of a foot or thereabouts. He found that a moderate fire was most proper, because a greater degree of heat made the composition frequently crack in many places. The time required for the baking or drying of this paste was generally about five or six hours before it attained a sufficient degree of hardness. When that was done, and the several baked pieces were become cold, he gave them their magnetic virtue in any direction he pleased, by placing them between the extreme ends of his large magazine of artificial magnets for a few seconds or more, as he saw occasion. By this method the virtue they acquired was such, that, when any of those pieces were held between two of his best ten-guinea bars, with its poles purposely inverted, it immediately of itself turned about to recover its natural direction, which the force of those very powerful bars was not sufficient to counteract.

As to the method of making artificial magnets of steel, none hath succeeded in it better than Mr Canton, whose process is as follows.

Procure a dozen of bars; six of soft steel, each three inches long, one quarter of an inch broad, and one twentieth of an inch thick; with two pieces of iron, each half the length of one of the bars, but of the same breadth and thickness: also six pieces of hard steel, each five inches and a half long, half an inch broad, and three-twentieths of an inch thick; with two pieces of iron of half the length, but the whole breadth and thickness of one of the hard bars; and let all the bars be marked with a line quite round them at one end. Then take an iron poker and tongs, (fig. 1.) or two bars of iron, the larger they are and the longer they have been used, the better; and fixing the poker upright between the knees, hold to it, near the top, one of the soft bars, having its marked end down-

wards, by a piece of sewing silk, which must be pulled tight by the left hand, that the bar may not slide; then grasping the tongs with the right hand, a little below the middle, and holding them nearly in a vertical position, let the bar be stroked by the lower end from the bottom to the top, about ten times on each side, which will give it a magnetic power sufficient to lift a small key at the marked end; which end, if the bar was suspended on a point, would turn towards the north, and is therefore called the *north pole*; and the unmarked end is, for the same reason, called the *south pole*. Four of the soft bars being impregnated after this manner, lay the two (fig. 2.) parallel to each other, at the distance of one fourth of an inch, between the two pieces of iron belonging to them, a north and a south pole against each piece of iron: then take two of the four bars already made magnetical, and place them together so as to make a double bar in thickness, the north pole of one even with the south pole of the other; and the remaining two being put to these, one on each side, so as to have two north and two south poles together; separate the north from the south poles at one end by a large pin, and place them perpendicularly with that end downward on the middle of one of the parallel bars, the two north poles towards its south, and the two south poles towards its north end: slide them backward and forward three or four times the whole length of the bar, and removing them from the middle of this, place them on the middle of the other bar as before directed, and go over that in the same manner; then turn both the bars the other side upwards, and repeat the former operation: this being done, take the two from between the pieces of iron; and, placing the two outermost of the touching bars in their room, let the other two be the outermost of the four to touch these with; and this process being repeated till each pair of bars have been touched three or four times over, which will give them a considerable magnetic power, put the half-dozen together after the manner of the four, (fig. 3.) and touch them with two pair of the hard bars placed between their irons, at the distance of about half an inch from each other; then lay the soft bars aside, and with the four hard ones let the other two be impregnated (fig. 4.), holding the touching bars apart at the lower end near two tenths of an inch; to which distance let them be separated after they are set on the parallel bar, and brought together again before they are taken off: this being observed, proceed according to the method described above, till each pair have been touched two or three times over. But as this vertical way of touching a bar will not give it quite so much of the magnetic virtue as it will receive, let each pair be now touched once or twice over in their parallel position between the irons (fig. 5.), with two of the bars held horizontally, or nearly so, by drawing at the same time the north of one from the middle over the south end, and the south of the other from the middle over the north end of a parallel bar; then bringing them to the middle again, without touching the parallel bar, give three or four of these horizontal strokes to each side. The horizontal touch, after the vertical, will make the bars as strong as they possibly can be made, as appears by their not receiving any additional strength, when the vertical touch is given by a great number of bars, and the

**Magnetism.** the horizontal by those of a superior magnetic power. This whole process may be gone through in about half an hour; and each of the large bars, if well hardened, may be made to lift 28 Troy ounces, and sometimes more. And when these bars are thus impregnated, they will give to an hard bar of the same size its full virtue in less than two minutes; and therefore will answer all the purposes of magnetism in navigation and experimental philosophy much better than the loadstone, which is known not to have a sufficient power to impregnate hard bars. The half dozen be-

ing put into a case (fig. 6.), in such a manner as that Magnetism two poles of the same denomination may not be together, and their irons with them as one bar, they will retain the virtues they have received; but if their power should, by making experiments, be ever so far impaired, it may be restored without any foreign assistance in a few minutes. And if, out of curiosity, a much larger set of bars should be required, these will communicate to them a sufficient power to proceed with; and they may, in a short time, by the same method, be brought to their full strength.

## M A G N E T I S M,

**T**HE quality or constitution of a body, and its pores, whereby it is rendered magnetical, or a magnet. See **MAGNET**.

Magnetism is found to be a transient power, capable of being produced and destroyed again.

### SECT. I. *The Laws of Magnetism.*

THE laws of magnetism are laid down by Mr Whiston in the following propositions.—1°. The loadstone has both an attractive and a directive power united together, whereby iron touched by it has only the former; i. e. the magnet not only attracts needles or filings of steel, but directs them to certain different angles with respect to its own surface and axis: whereas iron touched with it, does little or nothing more than attract them; still suffering them to lie along or stand perpendicular to its surface and edges in all places, without any such special direction.

2°. Neither the strongest nor the large magnets give a better directive touch to needles than those of a less size or virtue: to which it may be added, that whereas there are two qualities in all magnets, an attractive and a directive one; neither of them depend on, or are any argument of, the strength of the other.

3°. The attractive power of magnets, and of iron, will greatly increase or diminish the weight of needles on the balance; nay, will overcome that weight, and sustain other additional weights too: while the directive power has much smaller effect. Gassendus indeed, as well as Mesfennus and Dr Gilbert, maintain it has none at all: but mistakenly; for Mr Whiston found, from repeated trials on large needles, that after the touch they weighed less than before. One of 4584½ grains lost 2½ grains by the touch; and another of 65726 grains weight, no less than 14 grains.

4°. It is probable that iron consists almost wholly of the attractive particles; and the magnet, of the attractive and directive together: mixed, probably, together with other heterogeneous matter; as having never been purged by the fire, which iron has: and hence may arise the reason why iron, after it has been touched, will lift up much greater weights than the loadstone that touched it.

5°. The quantity and direction of magnetic powers, communicated to needles, is not properly, after such communication, owing to the magnet which gave the touch; but to the goodness of the steel which receives it, and to the strength and position of the terrestrial loadstone, whose influence alone those needles are af-

terwards subject to, and directed by: so that all such needles, if good, move with the same strength and point to the same angle; what loadstone soever (provided it be good) they were excited by. Nor does the touch seem to do much more in magnetical, than attraction in electrical cases; i. e. it serves to rub off some obstructing particles, that adhere to the surface of the steel, and open the pores of the bodies touched, and so make way for the entrance and exit of such effluvia as occasion or assist the powers we are speaking of. Hence Mr Whiston takes occasion to observe, that the directive power of the loadstone seems to be mechanical; and to be derived from magnetic effluvia, circulating continually round it.

6°. The absolute attractive power of different armed loadstones, is, *ceteris paribus*, according to the quantity, not of their diameters or solidities, but of the surfaces of the loadstones, or in a duplicate proportion of their diameters.

7°. The power of good magnets unarmed, not sensibly different in strength, similar in figure and position, but unequal in magnitude, is sometimes a little greater, sometimes a little less, than in the proportion of their similar diameters.

8°. The loadstone attracts needles that have been touched, and others that have not been touched, with equal force, at distances unequal, viz. where the distances are to one another as 5 to 2.

9°. Both poles of a loadstone equally attract needles, till they be thoroughly touched: then it is, and then only, that one pole begins to attract one end, and repel the other; though the repelling pole will still attract upon contact, nay at very small distances, notwithstanding.

10°. The attractive power of loadstones, in their similar position to, but different distances from magnetic needles, is in the sesquiduplicate proportion of the distances of their surfaces from their needles reciprocally, or as the mean proportionals between the squares and the cubes of those distances reciprocally, or as the square roots of the fifth powers of those distances reciprocally. Thus the magnetic power of attraction, at twice the distance from the surface of the loadstone, is between a fifth and sixth part of that power at the first distance. At thrice the distance, the power is between the 15th and 16th part; at four times the distance, the power 32 times as small; and at six times the distance, 88 times as small. Where it is to be noted, that the distances are not taken, as in the law of gravity, from the centre, but from the surface; all experience assuring us, that the

the magnetic power resides chiefly, if not wholly, in the surface of the loadstones and iron, without any particular relation to centre at all. The proportion here laid down was determined by Mr Whifton, from a great number of experiments of Mr Haukbee, Dr Brook Taylor, and himself; measuring the force by the chords of those arcs by which the magnet at several distances draws the needle out of its natural direction, to which chords (as he has demonstrated) it is ever proportional. The numbers in some of their most accurate trials lie gives us in the following table, setting down half the chords, or the sines of half those arcs of declination, as the true measures of the power of magnetism.

| Distances<br>in inches. | Degrees of<br>inclination. | Sines of<br>$\frac{1}{2}$ arcs. | Rat. $\frac{1}{2}$ of<br>dupl. |
|-------------------------|----------------------------|---------------------------------|--------------------------------|
| 20                      | —                          | —                               | 175                            |
| 14                      | —                          | —                               | 349                            |
| 13                      | —                          | —                               | 523                            |
| 12                      | —                          | —                               | 697                            |
| 11                      | —                          | —                               | 871                            |
| 10                      | —                          | —                               | 1045                           |
| 9                       | —                          | —                               | 1219                           |

11°. An inclinatory, or dipping-needle, of six inches radius, and of a prismatic or cylindrical figure, when it oscillates along the magnetic meridian, performs here every mean vibration in about 6" or 360"; and every small oscillation in about 5", or 330"; and the same kind of needle, four feet long, makes every mean oscillation in about 24", and every small one in about 22".

12°. The entire power of magnetism in this country, as it affects needles a foot long, is to that of gravity nearly as 1 to 300; and as it affects needles four feet long, as 1 to 600.

13°. The quantity of magnetic power accelerating the same dipping-needle, as it oscillates in different vertical planes, is ever as the cosines of the angles made by those planes; and the magnetic meridian, taken on the horizon.

Thus if we would estimate the quantity of forces in the horizontal and vertical situations of needles at London; we shall find that the latter, in needles a foot long, is to the entire force along the magnetic meridian as 96 to 100; and in needles four feet long, as 9667 to 10,000; whereas, in the former, the entire force in needles a foot long, is as 28 to 100; and in those four feet long, as 2560 to 10,000. Whence it follows, that the power by which horizontal needles are governed in these parts of the world is but one quarter of the power by which the dipping-needle is moved.

Hence also, since the horizontal needle is moved only by a part of the power which moves the dipping-needle; and that it only points to a certain place in the horizon, because that place is the nearest its original tendency of any its situation will allow it to tend to: whenever the dipping-needle stands exactly perpendicular to the horizon, the horizontal needle will not respect one point of the compass more than another, but will wheel about every way uncertainly.

14°. The time of oscillation and vibration, both in dipping and horizontal needles equally good, is as their length directly; and the actual velocity of their

points along their arcs always equal. Hence magnetic needles are, *ceteris paribus*, still better the longer they are; and that in the same proportion with their lengths.

The law of magnetic attraction is not yet ascertained. Sir Isaac Newton supposes it to decrease nearly in the triplicate ratio of the distance: but Dr Hellham, trying the experiment by his loadstone, found it to be as the squares of the distances inversely; and Mr Martin assures us, that the power of his loadstone decreases in a different manner from either, it being in the sesquiquiplicate ratio of the distances inversely. For exactness, he made a square bar of iron just a quarter of an inch thick, and then provided three pieces of wood of the same form and thickness exactly; then positing the loadstone very nicely at the end of a balance, which would turn with less than a grain, he placed under it the iron with first one piece of wood, then two pieces, and lastly all three pieces upon it: by which means the steel points of the pole were kept at  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , of an inch from the iron; and in those distances the weights put into the opposite scale, to raise the loadstone from the wood, which is touched while the beam was horizontal, were as follows:

|            | Grains.             | Rat. of sq. | Rat. of cub. | S. rat. |
|------------|---------------------|-------------|--------------|---------|
| Distances. | $\frac{1}{4}$ — 156 | — 156       | — 56         | — 156   |
|            | $\frac{1}{2}$ — 50  | — 39        | — 19         | — 56    |
|            | $\frac{3}{4}$ — 28  | — 17        | — 6          | — 30    |

When it appears, that the number of grains to counteract the power of the loadstone in these distances, approach very near, and are almost the same with those which are in the sesquiquiplicate ratio, but are widely different from those which are in the duplicate ratio; and this experiment Mr Martin tried several times for each distance, with scarce any variation in the success.

The ingenious Muschenbroeck has, with indefatigable pains and application, made experiments of the attractions and repulsions of loadstones in respect to iron and to each other; but could never find any regular proportion in the increase of attraction in their approach to, or decrease of attraction in their recess from, one another: only that the force of the magnetic virtue did increase in the approach to, and diminish in the recess from the stone, but not exactly as the distance, nor as the square or cube of the distance, nor as the square or cube of the distance reciprocally, nor in any proportion reducible to numbers; and therefore he conjectures, that the repulsions and attractions disturb one another, so as to confound the proportion.

## SECT. II. Of the Causes of Magnetism.

WITH respect to the causes of magnetism, nothing hath hitherto appeared that can be called a satisfactory solution of its phenomena. It is certain indeed, that both natural and artificial electricity will give polarity to needles, and even reverse their poles; but though from this it may appear probable that the electric fluid is also the cause of magnetism, yet in what manner the fluid acts while producing the magnetical phenomena seems to be totally unknown. All that hath been discovered with regard to this matter is, that a shock from a jar moderately charged, sent from end to end through a fine needle, will give it



## M A G N E T I S M.

## SECT. III.

Entertain-  
ing  
Experi-  
ments.

it a polarity. If the needle is reversed, and a similar shock sent through it the contrary way, the polarity will be destroyed; a third shock will reverse the poles; and the same thing is done by a second shock, if much stronger than the first. If the shock is sent through the sides of the needle, its ends will point east and west; the reason of which is, that one side of it is become a north, and the other a south pole. Most authors agree, that the end at which the electric blast enters becomes the north-pole; but, from some experiments, this seems very doubtful. The degree of magnetic virtue which electricity can communicate, is very far from being ascertained.

The direction of the magnetic effluvia is thought to be shown by the following experiment. Let AB, CD, (fig. 7.) be the poles of a magnet. Round every side lightly strew steel filings, on a sheet of white paper; the particles of the filings will be so affected by the effluvia the stone, as to show the course they take every way. In the middle of each pole, between AB and CD, they appear to proceed in lines nearly straight; towards the ends, they are more and more curved; till at last the lines from both sides, coinciding with each other, form numberless curves round the stone, which are nearly of a circular figure, as in the plate. Hence it is inferred that the magnetic effluvia, issuing from one pole, circulates to the other.

SECT. III. *Entertaining Experiments.*

CONSTRUCTION OF THE MAGNETIC PERSPECTIVE-GLASS.] Provide an ivory tube, about two inches and a half long, and of the form expressed in fig. 8. The sides of this tube must be thin enough to admit a considerable quantity of light. It is to open at one end with a screw: at that end there must be placed an eye-glass A of about two inches focus, and at the other end any glass you please. Have a small magnetic needle, like that placed on a compass. It must be strongly touched, and so placed at the bottom of the tube that it may turn freely round. It is to be fixed on the centre of a small ivory circle C, of the thickness of a counter, which is placed on the object-glass D, and painted black on the side next it. This circle must be kept fast by a circular rim of pasteboard, that the needle may not rise off its pivot, after the same manner as in the compass. This tube will thus become a compass, sufficiently transparent to show the motions of the needle. The eye-glass serves more clearly to distinguish the direction of the needle; and the glass at the other end, merely to give the tube the appearance of a common perspective. It will appear from the laws of magnetism already laid down, that the needle in this tube, when placed over, and at a small distance from, a magnet, or any machine in which it is contained, will necessarily place itself in a position directed by that magnet, and consequently show where the north and south pole of it is placed; the north end of the needle constantly pointing to the south end of the magnet. This effect will take place, though the magnet be inclosed in a case of wood, or even metal, as the magnetic effluvia penetrates all bodies. You must observe, however, that the attracting magnet must not be very far distant from the needle, especially if it be small, as in that

case its influence extends but to a short distance. This tube may be differently constructed, by placing the needle in a perpendicular direction, on a small axis of iron, on which it must turn quite freely, between two small plates of brass placed on each side the tube: the two ends of the needle should be in exact equilibrium. The north and south ends of this needle will, in like manner, be attracted by the south and north ends of the magnetic bar. The former construction, however, appears preferable, as it is more easily excited, and the situation of the needle much more easily distinguished.

EXPER. 1. *The communicative crown.*

TAKE a crown-piece, and bore a hole in the side of it; in which place a piece of wire, or a large needle, well polished, and strongly touched with a magnet. Then close the hole with a small piece of pewter, that it may not be perceived. Now the needle in the magnetic perspective before described, when it is brought near to this piece of money, will fix itself in a direction correspondent to the wire or needle in that piece. Desire any person to lend you a crown-piece, which you dextrously change for one that you have prepared as above. Then give the latter piece to another person, and leave him at liberty either to put it privately in a snuff-box, or not; he is then to place the box on a table, and you are to tell him, by means of your glass, if the crown is or is not in the box. Then bringing your perspective close to the box, you will know, by the motion of the needle, whether it be there or not; for as the needle in the perspective will always keep to the north of itself, if you do not perceive it has any motion, you conclude the crown is not in the box. It may happen, however, that the wire in the crown may be placed to the north, in which case you will be deceived. Therefore, to be sure of success, when you find the needle in the perspective remain stationary, you may make some pretence to desire the person to move the box into another position, by which you will certainly know if the crown-piece be there nor not.—You must remember, that the needle in the perspective must here be very sensible, as the wire in the crown cannot possibly have any great attractive force.

2. *The magnetic table.*

UNDER the top of a common table place a magnet that turns on a pivot; and fix a board under it, that nothing may appear. There may also be a drawer under the table, which you pull out to show that there is nothing concealed. At one end of the table there must be a pin that communicates with the magnet, and by which it may be placed in different positions: this pin must be so placed as not to be visible to the spectators. Strew some steel filings or very small nails over that part of the table where the magnet is. Then ask any one to lend you a knife, or a key, which will then attract part of the nails or filings. Then placing your hand in a careless manner on the pin at the end of the table, you alter the position of the magnet; and giving the key to any person, you desire him to make the experiment, which he will then not be able to perform. You then give the key to another person; at the same time placing the magnet, by

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by means of the pin, in the first position, when that person will immediately perform the experiment.

### 3. *The mysterious watch.*

You desire any person to lend you his watch, and ask him if he thinks it will or will not go when it is laid on the table. If he say it will, you place it over the end of the magnet, and it will presently stop (A). You then mark with chalk, or a pencil, the precise point where you placed the watch; and moving the position of the magnet, as in the last experiment, you give the watch to another person, and desire him to make the experiment; in which he not succeeding, you give it to a third person, at the same time replacing the magnet, and he will immediately perform the experiment.

### 4. *The magnetic dial.*

Provide a circle of wood or ivory, of about five or six inches diameter, as fig. 9. which must turn quite free on the stand B (fig. 10.) in the circular border A: on the circle must be placed the dial of pasteboard C (fig. 9.), whose circumference is to be divided into 12 equal parts, in which must be inscribed the numbers from 1 to 12, as on a common dial. There must be a small groove in the circular frame D, to receive the pasteboard circle: and observe, that the dial must be made to turn so free, that it may go round without moving the circular border in which it is placed. Between the pasteboard circle and the bottom of the frame, place a small artificial magnet E, (fig. 11.) that has a hole in its middle, or a small protuberance. On the outside of the frame place a small pin P, which serves to show where the magnetic needle I, that is placed on a pivot at the centre of the dial, is to stop. This needle must turn quite free on its pivot, and its two sides should be in exact equilibrium. Then provide a small bag, that has five or six divisions, like a lady's work-bag, but smaller. In one of these divisions put small square pieces of pasteboard, on which are wrote the numbers from 1 to 12, and if you please you may put several of each number. In each of the other divisions you must put 12 or more like pieces; observing, that all the pieces in each division must be marked with the same number. Now the needle being placed upon its pivot, and turned quickly about, it will necessarily stop at that point where the north end of the magnetic bar is placed, and which you previously know by the situation of the small pin in the circular border. You therefore present to any person that division of the bag which contains the several pieces on which is wrote the number opposite to the north end of the bar, and tell him to draw any one of them he pleases. Then placing the needle on the pivot, you turn it quickly about, and it will necessarily stop, as we have already said, at that particular number.

Another experiment may be made with the same dial, by desiring two persons to draw each of them one number out of two different divisions of the bag; and if their numbers, when added together, exceed 12, the needle or index will stop at the number they exceed it; but if they do not amount to 12, the index will stop at the sum of those two numbers. In order

to perform this experiment, you must place the pin against the number 5, if the two numbers to be drawn from the bag be 10 and 7; or against 9, if they be 7 and 2.—If this experiment be made immediately after the former, as it easily may, by dexterously moving the pin, it will appear the more extraordinary.

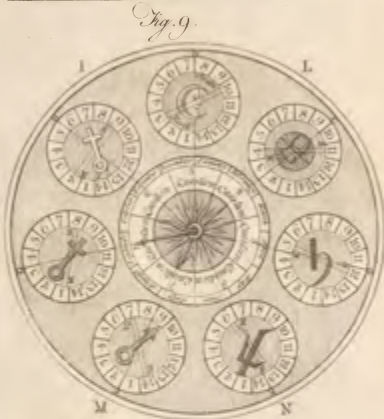
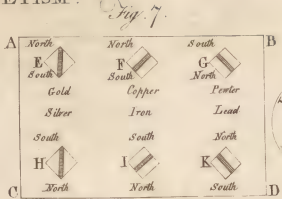
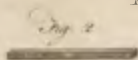
### 5. *The dexterous painter.*

Provide two small boxes, as M and N (fig. 12.), four inches wide, and four inches and a half long. Let the box M be half an inch deep, and N two-thirds of an inch. They must both open with hinges, and shut with a clasp. Have four small pieces of light wood, (fig. 13, 14, 15, 16.) of the same size with the inside of the box M (fig. 12.), and about one third of an inch thick. In each of these let there be a groove, as AB, EF, CD, GH: these grooves must be in the middle, and parallel to two of the sides. In each of these grooves place a strong artificial magnet, as fig. 17. The poles of these magnets must be properly disposed with regard to the figures that are to be painted on the boards; as is expressed in the plate. Cover the bars with paper, to prevent their being seen; but take care, in passing it on, not to wet the bars, as they will thereby rust, which will considerably impair their virtue. When you have painted such subjects as you choose, you may cover them with a very thin clear glass. At the centre of the box N, place a pivot (fig. 18.), on which a small circle of pasteboard OPQR (fig. 19.) is to turn quite free; under which is to be a touched needle S. Divide this circle into four parts, which are to be disposed with regard to the poles of the needle, as is expressed in the figure. In these four divisions you are to paint the like subjects as are on the four boards, but reduced to a smaller compass. Cover the inside of the top of this box with a paper M, (see fig. 12.), in which must be an opening D, at about half an inch from the centre of the box, that you may perceive, successfully, the four small pictures on the pasteboard circle just mentioned. This opening is to serve as the cloth on which the little painter is supposed to draw one of the pictures. You may cover the top of the box, if you please, with a thin glass. Then give the first box to any person, and tell him to place any one of the four pictures in it privately, and when he has closed it, to give it you. You then place the other box over it; when the moveable circle, with the needle, will turn till it comes in the same position with the bar in the first box. It will then appear that the little dexterous painter has already copied the picture that is inclosed in the first box.

### 6. *The cylindric oracle.*

Provide a hollow cylinder of about six inches high plate and three wide, as AB. Its cover CD must be made CLXIV. to fix on any way. On one side of this box or cylind. fig. 1. der let there be a groove, nearly of the same length with that side; in which place a small steel bar (fig. 2.) that is strongly impregnated, with the north pole near the bottom of the cylinder. On the upper side of the cover describe a circle; and divide it into ten equal parts, in which are to be wrote the numbers from 1 to 10, as is expressed in fig. 3. Place a pivot at the

(A) To perform this experiment, you must use a strong magnetic bar; and the balance of the watch must not be of brass, but steel.







the centre of this circle, and have ready a magnetic needle. You are then to provide a bag, in which there are several divisions, like that described in exper. 4. In each of these divisions put a number of papers, on which the same or similar questions are wrote. In the cylinder put several different answers to each question, and seal them up in the manner of small letters. On each of these letters or answers is to be wrote one of the numbers of the dial or circle at the top of the box. You are supposed to know the number of the answers to each question. You then offer one of the divisions of the bag, observing which division it is, to any person, and desire him to draw one of the papers. Next put the top on the cylinder, with that number which is wrote on the answer directly over the bar. Then placing the needle on the pivot, you turn it briskly about, and it will naturally stop at the number over the bar. You then desire the person who drew the question to observe the number at which the needle stands, and to search in the box for a paper with the same number, which he will find to contain the answer.—You may repeat the experiment by offering another division of the bag to the same or another person; and placing the number that corresponds to the answer over the magnetic bar, proceed as before.

It is easy to conceive of several answers to the same question. For example, suppose the question to be, Is it proper to marry?

Answer 1. While you are young not yet, when you are old not at all.

2. Marry in haste, and repent at leisure.

3. Yes, if you can get a good fortune; for something has some favour, but nothing has no flavour.

4. No, if you are apt to be out of humour with yourself; for then you will have two persons to quarrel with.

5. Yes, if you are sure to get a good husband (wife); for that is the greatest blessing of life. But take care you are sure.

6. No, if the person you would marry is an angel; unless you will be content to live with a devil.

#### 7. The enchanted ewer.

Fix a common ewer, as A, (fig. 4.) of about 12 inches high, upon a square stand BC; in one side of which there must be a drawer D, of about four inches square and half an inch deep. In the ewer place a hollow tin cone, inverted, as AB, fig. 5. of about four inches and a half diameter at top, and two inches at bottom; and at the bottom of the ewer there must likewise be a hole of two inches diameter.

Upon the stand, at about an inch distance from the bottom of the ewer, and directly under the hole, place a small convex mirror H, of such convexity that a person's visage, when viewed in it, at about 15 inches distance, may not appear above two inches and a half long.

Upon the stand likewise, at the point I, fig. 2. place a pivot of half an inch high, on which must be fixed a touched needle RQ, inclosed in a circle of very thin pasteboard OS, fig. 6. of five inches diameter. Divide this pasteboard into four parts, in each of which draw a small circle: and in three of these circles paint a head as x, y, z, the dress of each of which is to be dif-

ferent, one, for example, having a turban, another a hat, and the other a woman's cap. Let that part which contains the face in each picture be cut out, and let the fourth circle be entirely cut out; as it is expressed in the figure. You must observe, that the poles of the needle are to be disposed in the same manner as in the plate.

You are next to provide four small frames of wood or pasteboard, n<sup>o</sup> 1. 2. 3. 4. each of the same size with the inside of the drawer. On these frames must be painted the same figures as on the circular pasteboard; with this difference, that there must be no part of them cut out. Behind each of these pictures place a magnetic bar, in the same direction as is expressed in the plate; and cover them over with paper, that they may not be visible. Matters being thus prepared, you first place in the drawer the frame n<sup>o</sup> 4. on which there is nothing painted. You then pour a small quantity of water into the ewer, and desire the company to look into it, asking them if they see their own figures as they are. Then you take out the frame n<sup>o</sup> 4. and give the three others to any one, desiring him to choose in which of those dresses he would appear. Then put the frame with the dress he has chose in the drawer; and a moment after, the person looking into the ewer will see his own face surrounded with the dress of that picture. For, the pasteboard circle (divided, as above described, into four parts, in three of which are painted the same figures as on three of the boards, and the fourth left blank) containing a magnetic needle, and the four boards having each a concealed magnet; therefore, when one of them is put in the drawer under the ewer, the circle will correspond to the position of that magnet, and consequently the person looking into the top of the ewer will see his own face surrounded with the head-dress of the figure in the drawer.—This experiment, well performed, is highly agreeable. As the pasteboard circle can contain only three heads, you may have several such circles, but you must then have several other frames; and the ewer must be made to take off from the stand.

#### 8. The box of metals.

Provide a wooden box, about thirteen inches long and seven wide, as ABCD (fig. 7.). The cover of this box should be as thin as possible. Have six small boxes or tablets, about an inch deep, all of the same size and form, as EFGHIK, that they may indiscriminately go into similar holes made in the bottom of the large box. In each of these tablets is to be placed a small magnetic ball, and their poles are to be disposed as expressed in the figure. Cover each of these tablets with a thin plate of one of the six following metals, viz. gold, silver, copper, iron, pewter, and lead. You must also have a magnetic perspective, at the end of which is to be two circles, one divided into six equal parts, and the other into four, as in fig. 8. from the centre of which there must be drawn an index N, whose point is to be placed to the north. Therefore, when you are on the side CD of the box, and hold your perspective over any one of the tablets that are placed on the holes E, F, G, so that the index drawn on the circle is perpendicular to the side AB, the needle in the perspective will have its south pole directed to the letter that denotes the metal contained in that

Entertaining Experiments.

Plate CLXIV.

that tablet. When you hold the perspective over one of the boxes placed in the holes H, I, K, so that the index drawn on the circle is perpendicular to the side CD, the fourth pole of the needle will in like manner express the name of the metal inclosed. If the under-side of any one of the tablets be turned upward, the needle will not then take any of the above directions, but naturally point to the north; and its motion will be much slower. You therefore give the box to any one, and leave him at liberty to dispose all the tablets in what manner and with what side upward he please, and even to take any one of them away. Then, by the aid of your perspective, you tell him immediately the name of the metal on each tablet, and of that he has taken away.

This box of metals will, on comparison, be found far to exceed that which has been publicly exhibited: for that, being composed of six tablets, of which two only differ in form, admits but of six different dispositions, whereas in this the tablets may be placed 720 different ways. In the other, you must also know the particular side of the box, which in this is not at all necessary. Nay, you may here distinguish each metal, though the box be completely covered with paper; for the effect of the needle will be always the same. The experiments with this box are therefore much more extraordinary, and its construction at the same time more simple.

#### 9. The magnetic planetarium.

CONSTRUCT a round box, ILMN, (fig. 9.), of eight or nine inches diameter, and half an inch deep. On its bottom fix a circle of pasteboard, on which draw the central circle A, and the seven circumjacent circles B, C, D, E, F, G, H. Divide the central circle into seven equal parts by the lines AB, AC, AD, AE, AF, AG, and AH, which must pass through the centres of the other circles, and divide each of them into two equal parts. Then divide the circumference of each of those circles into 14 equal parts, as in the figure. You are likewise to have another pasteboard of the same figure, and divided in the same manner, which must turn freely in the box, by means of an axis placed on a pivot; one end of which is to be fixed in the centre of the circle A. See fig. 10. On each of the seven smaller circles at the bottom of the box, place a magnetic bar, two inches long, in the same direction with the diameters of those circles, and their poles in the situations expressed in the figure. There must be an index O, like that of the hour-hand of a dial, which is to be fixed on the axis of the central circle, and by which the pasteboard circle in the box may be turned about. There must be also a needle P, which must turn freely on the axis, without moving the circular pasteboard.—In each of the seven divisions of the central circle write a different question; and in another circle, divided into 12 parts, you may write the names of the 12 months. In each of the seven circles write two answers to each question, observing that there must be but seven words in each an-

swer; in the following manner. In the first division of the circle G, which is opposite to the first question, write the first word of the first answer. In the second division of the next circle, write the second word; and so on to the last word, which will be in the seventh division of the seventh circle. In the eighth division of the first circle, write the first word of the second answer; in the ninth division of the second circle, write the second word of the same answer; and so on to the 14th division of the seventh circle, which must contain the last word of that answer. The same must be done for all the seven questions; and to each of them must be assigned two answers, the words of which are to be dispersed through the seven circles. At the center of each of these circles place a pivot; and have two magnetic needles, the pointed end of one of which must be north, and the other south, (QR). Now, the index of the central circle being directed to any one of the questions, if you place one of the two magnetic needles on each of the seven lesser circles, they will fix themselves according to the direction of the bars on the correspondent circles at the bottom of the box, and consequently point to the seven words that compose the answer. If you place one of the other needles on each circle, it will point to the words that are diametrically opposite to those of the first answer, the north pole being in the place of the fourth pole of the other.—You therefore present this planetarium to any person, and desire him to choose one of the questions there wrote; and you then set the index of the central circle to that question, and putting one of the needles on each of the seven circles, you turn it about; and when they all settle, they will point to the seven words that compose the answer. The two answers may be one favourable and the other unfavourable; and the different needles will serve to diversify the answers when you repeat the experiment.

There may be also a moveable needle to place against the names of the months; and when the party has fixed upon a question, you place that needle against the month in which he was born, which will give the business an air of more mystery. On the centre of the large circle may be the figure of the sun; and on each of the seven smaller circles one of the characters of the five planets, together with the earth and moon. This experiment, well executed, is one of the most entertaining that magnetism has produced.

#### 10. The sagacious swan.

PROVIDE a box XY, 18 inches long, nine wide, and two deep, the top of which is to slide on and off at the end Y. Toward the end X, describe a circle of six inches diameter, round which are to be fixed six small vials of wood or ivory, of one inch and a half high; and to each of them there must be a cover. At the end Y place an egg B, of ivory or other matter, of about three inches and a half high, with a cover that shuts by a hinge, and falls with a spring. It must be fixed on the stand C; through which, as well as the bottom of the egg, and the part of the box directly underneath, there must pass a hole of one-third of an inch in diameter. In this cavity place an ivory cylinder F, that can move freely, and rises or falls by means of the spring R. You must have a thin copper basin A, of six inches diameter, which is to be placed

Entertaining Experiments.

Plate CLXV.



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on the centre of the circle at X, and consequently in the middle of the six vases. Let a proper workman construct the movement expressed by fig. 2, which is composed of a quadrant G, that has 16 teeth, and is moveable about an axis in the stand H, that has an elbow, by which it is screwed to the bottom of the box at L. To the quadrant there must be joined the straight piece K. The horizontal wheel M has 24 teeth; and is supported by the piece S, which is screwed to the end of the box next Y. On the axis of this wheel place a brass rod OP, five inches long; and at the part O place a large bar or horse-shoe, of a semicircular form, and about two inches and a half diameter, strongly impregnated. The steel rod V, takes at one end the teeth of the quadrant G, by the pinion F, and at the other end the wheel M, by the perpendicular wheel N, of 30 teeth; the two ends of this rod are supported by the two stands that hold the other pieces. Under the piece K, that joins to the quadrant, must be placed the spring R, by which it is raised, and pushes up the cylinder that goes thro' the stand C into the egg. You must also have six small etwees or cases, as Y, fig. 3. They must be of the same circumference with the cylinder in the stand, and round at their extremities: their length must be different, that, when they are placed in the egg, and the lower end enters the hole in which is the cylinder, they may thrust it down more or less, when the top of the egg, against which they press, is fastened down; and thereby lower the bar that is fixed to the end of the quadrant, and consequently, by means of the pinion (fig. 4.) and wheels N M (fig. 2.), turn the horse-shoe that is placed upon the axis of the last wheel. The exact length of these etwees can be determined by trials only; which trials, however, may be made with round pieces of wood. In each of these etwees place a different question, wrote on a slip of paper and rolled up, and in each of the vases put the answer to one of the questions; as you will know, by trials, where the magnetic bar or horse-shoe will stop. Lastly, provide a small figure of a swan, or what other you please, made of cork or enamel, in which you must fix a touched needle, of the largest size of those commonly used in sewing.

Being thus prepared, you offer a person the six etwees, and desire him to choose any one of them himself, and conceal the others, or give them to different persons. He is then to open his etwee, read the question it contains to himself, and return the etwee to you, after replacing the question. You then put the etwee in the egg, and, placing the swan upon the water in the basin, you tell the company she will presently discover in which of the vases the answer is con-

tained. The same experiment may be repeated with all the etwees.

### 11. The multifarious verse.

THE eight words that compose this Latin verse, *Tot sunt tibi dotes, quot cali sidera, virgo (A)*, being privately placed in any one of the different combinations of which they are susceptible, and which are 40320 in number, to tell the order in which they are placed.

Provide a box that shuts with hinges, and is eight inches long, three wide, and half an inch deep. Have eight pieces of wood about one-third of an inch thick, two inches long, and one and a half wide, which will therefore, when placed close together, exactly fill the box. In each of these pieces or tablets place a magnetic bar, with their poles as is expressed in the figure. The bars being covered over, write on each of the tablets, in the order they then stand, one of the words of the foregoing Latin verse. On a very thin board of the same dimensions with the box, draw the eight circles, A, B, C, D, E, F, G, H, (fig. 12.) whose centres should be exactly over those of the eight tablets in the box when the board is placed upon it. Divide each of those circles into eight parts, as in the figure; and in each of those divisions write one of the words of the Latin verse, and in the precise order expressed in the plate; so that, when the board is placed over the box, the eight touched needles placed at the centre of the circles may be regulated by the poles of the bars in the box, and consequently the word that the needle points to in the circle be the same with that inscribed on the tablet. Cover the board with a glass, to prevent the needles from rising off their pivots, as is done in the sea-compass. Over the board place four plates of glass, I, L, M, N, fig. 13, which will give the machine the figure of a truncated pyramid, of eight inches high. Cover it with a glass, or rather a board in which are placed two lenses, O O, of eight inches focus, and distant from each other about half an inch. Line the four plates of glass that compose the sides with very thin paper, that will admit the light, and at the same time prevent the company from seeing the circles on the board.

These preparations being made, you give the box to any one; and tell him to place the tablets on which the words were wrote, privately, in what position he thinks proper, then to close the box, and, if he please, to wrap it up in paper, seal it, and give it you. Then placing the board with the pyramid upon it, you immediately tell him the order in which the tablets are placed, by reading the words to which the needles on the circles point.

### M A G

MAGNITUDE, whatever is made up of parts locally extended, or that hath several dimensions; as a line, surface, solid, &c.

MAGNIFYING, the making of objects appear larger than they would otherwise do; whence convex lenses, which have the power of doing this, are called *magnifying glasses*. See OPTICS.

MAGNOLIA, the LAUREL-LEAVED TULIP-TREE; a genus of the polygynia order, belonging to the po-

### M A G

lyandria class of plants.

*Species*. 1. The glauca or small magnolia is a native of Virginia, Carolina, and other parts of North America. In moist places it rises from seven or eight to 15 or 16 feet high, with a slender stem. The wood is white and spongy, the bark smooth and of a greenish white colour; the branches garnished with thick smooth leaves, like those of the bay; but of an oval shape, smooth on their edges, and white underneath.

(A) i.e. Thy virtues, virgin, are as numerous as the stars of heaven.

Magnolia  
Mahogany.

neath. The flowers are produced at the extremities of the branches; are white, composed of six concave petals, and have an agreeable scent. After the flowers are past, the fruit increases in size till it becomes as large as a walnut with its cover; but of a conical shape, having many cells round the outside, in each of which is a flat seed about the size of a small kidney-bean. When ripe, the fruit is of a brown colour, the seeds are discharged from their cells, and hang by a slender thread. 2. The grandiflora, or great magnolia, is a native of Florida and South Carolina. It rises to the height of 80 feet or more, with a straight trunk upwards of two feet diameter, having a regular head. The leaves resemble those of the laurel, but are larger, and continue green throughout the year. The flowers are produced at the ends of the branches, and are of a purplish white colour. 3. The tripetala, or umbrella-tree, is a native of Carolina. It rises, with a slender trunk to the height of 16 or 20 feet; the wood is soft and spongy; the leaves remarkably large, and produced in horizontal circles, somewhat resembling an umbrella, from whence the inhabitants of those countries have given it this name. The flowers are composed of ten or eleven white petals, that hang down without any order. The leaves drop off at the beginning of winter. 4. The acuminata, with oval, spear-shaped, pointed leaves, is a native of the inland parts of North America. The leaves are near eight inches long, and five broad; ending in a point. The flowers come out early in the spring, and are composed of 12 white petals; the wood is of a fine grain, and an orange colour.

*Culture.* All these species are propagated by seeds, which must be procured from the places where they grow naturally. They should be put up in sand, and sent over as soon as possible; for if they are kept long out of the ground, they rarely grow.

MAGNUS (John), archbishop of Upsal, was born at Lincopping in 1488. Being made apostolical nuncio, he used his utmost endeavours to prevent Gustavus Vasa from becoming king of Sweden, and the introduction of Lutheranism into his dominions; and spared no means to attain these ends. He died at Rome in 1545. He wrote a history of Sweden, and a history of the archbishops and bishops of Upsal. He was succeeded by his brother Olaus Magnus.

MAGNUS CAMPUS, (anc. geog.), a tract lying towards Scythopolis, or Bethsan in Galilee, beyond which it extends into Samaria; Josephus placing the common boundary between these two districts, in the Campus Magnus. Called also *Efærelon*, (Judith); 30 miles long, and 18 broad; having Samaria with mount Ephraim to the south, the lake Genesareth to the east, mount Carmel to the west, and Lebanon to the north.

MAGNUS PORTUS, (anc. geog.), a port of the Belgæ, in Britain, on the Channel. Now thought to be Portsmouth, in Hampshire, (Camden).—Another *Portus Magnus* of Bætica in Spain, (Ptolemy); a port to the east of Abdera.

MAGO, the name of several Carthaginian generals. See CARTHAGE.

MAGPY, in ornithology. See CORVUS.

MAHIE. See BREAD-Tree.

MAHO. See HIBISCUS.

MAHOGANY. See CEDRUS.

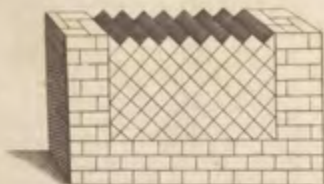
MAHOMET, or MOHAMMED, styled the *Impostor*, Mahomet, was born in the reign of Anushirwan the Just, emperor of Persia, about the end of the 6th century of the Christian era. He came into the world under some disadvantages. His father Abd'allah was a younger son of Abd'almotaleb; and dying very young, and in his father's lifetime, left his widow and infant-son in very mean circumstances, his whole subsistence consisting but of five camels and one Ethiopian slave. Abd'almotaleb was therefore obliged to take care of his grandchild Mahomet; which he not only did during his life, but at his death enjoined his eldest son Abu Taleb, who was brother to Abd'allah by the same mother, to provide for him for the future: which he very affectionately did, and instructed him in the business of a merchant, which he followed; and to that end he took him into Syria when he was but 13. He afterwards recommended him to Khadijah, a noble and rich widow, for her factor; in whose service he behaved himself so well, that by making him her husband she soon raised him to an equality with the richest in Mecca.

After he began by this advantageous match to live at his ease, it was, that he formed the scheme of establishing a new religion, or, as he expressed it, of replanting the only true and ancient one professed by Adam, Noah, Abraham, Moses, Jesus, and all the prophets, by destroying the gross idolatry into which the generality of his countrymen had fallen, and weeding out the corruptions and superstitions which the latter Jews and Christians had, as he thought, introduced into their religion, and reducing it to its original purity, which consisted chiefly in the worship of one only God.

Before he made any attempt abroad, he rightly judged that it was necessary for him to begin with the conversion of his own household. Having therefore retired with his family, as he had done several times before, to a cave in mount Hara, he there opened the secret of his mission to his wife Khadijah; and acquainted her, that the angel Gabriel had just before appeared to him, and told him that he was appointed the apostle of God: he also repeated to her a passage which he pretended had been revealed to him by the ministry of the angel, with those other circumstances of this first appearance, which are related by the Mahometan writers. Khadijah received the news with great joy; swearing by him in whose hands her soul was, that she trusted he would be the prophet of his nation; and immediately communicated what she had heard to her cousin Warakah Ebn Nawfal, who, being a Christian, could write in the Hebrew character, and was tolerably well versed in the scriptures; and he as readily came into her opinion, assuring her that the same angel who had formerly appeared unto Moses was now sent to Mahomet. The first overtture the prophet made was in the month of Ramadan, in the 40th year of his age, which is therefore usually called the year of his mission.

Encouraged by so good a beginning, he resolved to proceed, and try for some time what he could do by private persuasion, not daring to hazard the whole affair by exposing it too suddenly to the public. He soon made proselytes of those under his own roof, viz. his wife Khadijah, his servant Zeid Ebn Haretha (to whom

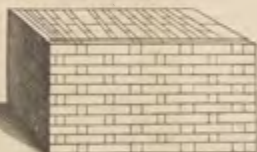
*Fig. 1.*



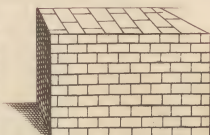
N<sup>o</sup> 2.



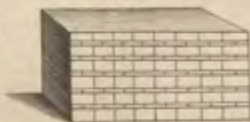
N<sup>o</sup> 3.



N<sup>o</sup> 4.



N<sup>o</sup> 5.



N<sup>o</sup> 8.



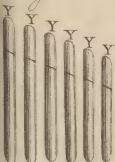
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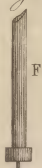
N<sup>o</sup> 7.



*Fig. 3.*



*Fig. 4.*







Mahomet. he gave his freedom on that occasion, (which afterwards became a rule to his followers) and his cousin and pupil Ali, the son of Abu Taleb, though then very young; but this last, making no account of the other two, used to style himself the *first of believers*. The next person Mahomet applied to was Abd'allah Ebn Abi Kohafa, surnamed *Abu Beer*, a man of great authority among the Koreish, and one whose interest he well knew would be of great service to him; as it soon appeared: for Abu Beer, being gained over, prevailed also on Othman Ebn Affan, Abd'alrahman Ebn Awf, Saad Ebn Abi Wakkas, al Zobeir Ebn al Awwam, and Telha Ebn Obaidallah, all principal men of Mecca, to follow his example. These men were the six chief companions, who, with a few more, were converted in the space of three years: at the end of which, Mahomet having, as he hoped, a sufficient interest to support him, made his mission no longer a secret, but gave out that God had commanded him to admonish his near relations; and in order to do it with more convenience and prospect of success, he directed Ali to prepare an entertainment, and invite the sons and descendants of Abd'almotaleb, intending then to open his mind to them. This was done, and about 40 of them came; but Abu Laheb, one of his uncles, making the company break up before Mahomet had an opportunity of speaking, obliged him to give them a second invitation the next day; and when they were come, he made them the following speech: "I know no man in all Arabia who can offer his kindred a more excellent thing than I now do you: I offer you happiness both in this life, and in that which is to come; God Almighty hath commanded me to call you unto him: Who, therefore, among you will be assiduous to me herein, and become my brother and my vicerger?" All of them hesitating, and declining the matter, Ali at length rose up, and declared that he would be his assistant; and vehemently threatened those who should oppose him. Mahomet upon this embraced Ali with great demonstrations of affection, and desired all who were present to hearken to and obey him as his deputy; at which the company broke out into a great laughter, telling Abu Taleb that he must now pay obedience to his son.

This repulse, however, was so far from discouraging Mahomet, that he began to preach in public to the people; who heard him with some patience, till he came to upbraid them with the idolatry, obstinacy, and perverseness, of themselves and their fathers: which so highly provoked them, that they declared themselves his enemies; and would soon have procured his ruin, had he not been protected by Abu Taleb. The chief of the Koreish warmly solicited this person to desert his nephew, making frequent remonstrances against the innovations he was attempting; which proving ineffectual, they at length threatened him with an open rupture, if he did not prevail on Mahomet to desist. At this Abu Taleb was so far moved, that he earnestly dissuaded his nephew from pursuing the affair any farther, representing the great danger he and his friends must otherwise run. But Mahomet was not to be intimidated; telling his uncle plainly, *that if they set the sun against him on his right hand, and the moon on his left, he would not leave his enterprise*; and Abu Taleb, seeing him so firmly resolved to proceed, used no

further arguments, but promised to stand by him against all his enemies.

The Koreish, finding they could prevail neither by fair words or menaces, tried what they could do by force and ill treatment; using Mahomet's followers so very injuriously, that it was not safe for them to continue at Mecca any longer: whereupon Mahomet gave leave to such of them as had not friends to protect them to seek for refuge elsewhere. And accordingly, in the fifth year of the prophet's mission, 16 of them, four of whom were women, fled into Ethiopia; and among them Othman Ebn Affan and his wife Rakhiah, Mahomet's daughter. This was the first flight; but afterwards several others followed them, retiring one after another, to the number of 83 men and 18 women, besides children. These refugees were kindly received by the Najashi, or king of Ethiopia; who refused to deliver them up to those whom the Koreish sent to demand them, and, as the Arab writers unanimously attest, even professed the Mahometan religion.

In the sixth year of his mission, Mahomet had the pleasure of seeing his party strengthened by the conversion of his uncle Hamza, a man of great valour and merit; and of Omar Ebn al Kattab, a person highly esteemed, and once a violent opposer of the prophet. As persecution generally advances rather than obstructs the spreading of a religion, Islamism made so great a progress among the Arab tribes, that the Koreish, to suppress it effectually, if possible, in the seventh year of Mahomet's mission, made a solemn league or covenant against the Hashemites and the family of Abd'almotaleb, engaging themselves to contract no marriages with any of them, and to have no communication with them; and, to give it the greater sanction, reduced it into writing, and laid it up in the Caaba. Upon this the tribe became divided into two factions; and the family of Hashem all repaired to Abu Taleb, as their head; except only Abd'al Uzza, surnamed *Abu Laheb*, who, out of inveterate hatred to his nephew and his doctrine, went over to the opposite party, whose chief was Abu Sofian Ebn Harb, of the family of Ommeia.

The families continued thus at variance for three years; but, in the tenth year of his mission, Mahomet told his uncle Abu Taleb, that God had manifestly shewed his disapprobation of the league which the Koreish had made against them, by sending a worm to eat out every word of the instrument, except the name of *God*. Of this accident Mahomet had probably some private notice: for Abu Taleb went immediately to the Koreish, and acquainted them with it; offering, if it proved false, to deliver his nephew up to them; but, in case it were true, he insisted that they ought to lay aside their animosity, and annul the league they had made against the Hashemites. To this they acquiesced; and, going to inspect the writing, to their great astonishment found it to be as Abu Taleb had said; and the league was thereupon declared void.

In the same year Abu Taleb died, at the age of above fourscore; and it is the general opinion that he died an infidel: though others say, that when he was at the point of death he embraced Mahometanism; and produce some passages out of his poetical compositions to confirm their assertion. About a month, or, as some

write, three days after the death of this great benefactor and patron, Mahomet had the additional mortification to lose his wife Khadijah, who had so generously made his fortune. For which reason this year is called the *year of mourning*.

On the death of these two persons, the Koreish began to be more troublesome than ever to their prophet, and especially some who had formerly been his intimate friends; insomuch that he found himself obliged to seek for shelter elsewhere, and first pitched upon Tayef, about 60 miles east from Mecca, for the place of his retreat. Thither therefore he went, accompanied by his servant Zied, and applied himself to two of the chief of the tribe of Thakif who were the inhabitants of that place; but they received him very coldly. However, he staid there a month; and some of the more confederate and better sort of men treated him with a little respect: but the slaves and inferior people at length rose against him; and, bringing him to the wall of the city, obliged him to depart and return to Mecca, where he put himself under the protection of al Motaam Ebn Adi.

This repulse greatly discouraged his followers. However, Mahomet was not wanting to himself; but boldly continued to preach to the public assemblies at the pilgrimage, and gained several proselytes; and among them fix of the inhabitants of Yathreb of the Jewish tribe of Khazraj, who, on their return home, failed not to speak much in commendation of their new religion, and exhorted their fellow-citizens to embrace the same.

In the 12th year of his mission it was that Mahomet gave out that he had made his night-journey from Mecca to Jerusalem, and thence to heaven, so much spoken of by all that write of him. Dr Prideaux thinks he invented it, either to answer the expectations of those who demanded some miracle as a proof of his mission; or else, by pretending to have conversed with God, to establish the authority of whatever he should think fit to leave behind by way of oral tradition, and make his sayings to serve the same purpose as the oral law of the Jews. But it does not appear that Mahomet himself ever expected to great a regard should be paid to his sayings, as his followers have since done; and seeing he all along disclaimed any power of performing miracles, it seems rather to have been a fetch of policy to raise his reputation, by pretending to have actually conversed with God in heaven, as Moses had heretofore done in the mount, and to have received several institutions immediately from him, whereas before he contented himself with persuading them that he had all by the ministry of Gabriel.

However, this story seemed so absurd and incredible, that several of his followers left him upon it; and had probably ruined the whole design, had not Abu Beer vouched for his veracity, and declared, that, if Mahomet affirmed it to be true, he verily believed the whole. Which happy incident not only retrieved the prophet's credit, but increased it to such a degree, that he was secure of being able to make his disciples swallow whatever he pleased to impose on them for the future. And this fiction, notwithstanding its extravagance, was one of the most artful contrivances Mahomet ever put in practice, and what chiefly contributed to the raising of his reputation to that great height to which

it afterwards arrived.

In this year, called by the Mahometans the *accepted year*, 12 men of Yathreb or Medina, of whom ten were of the tribe of Khazraj, and the other two of that of Aws, came to Mecca, and took an oath of fidelity to Mahomet at al Akaba, a hill on the north of that city. This oath was called the *women's oath*; not that any women were present at this time, but because a man was not thereby obliged to take up arms in defence of Mahomet or his religion; it being the same oath that was afterwards exacted of the women, the form of which we have in the Koran, and is to this effect: viz. That they should renounce all idolatry; and they should not steal, nor commit fornication, nor kill their children (as the Pagan Arabs used to do when they apprehended they should not be able to maintain them,) nor forge calumnies; and that they should obey the prophet in all things that were reasonable. When they had solemnly engaged to all this, Mahomet sent one of his disciples, named *Masab Ebn Omair*, home with them, to instruct them more fully in the grounds and ceremonies of his new religion.

Masab being arrived at Medina, by the assistance of those who had been formerly converted, gained several proselytes, particularly Osaïd Ebn Hodeira, a chief man of the city, and Saad Ebn Moadh, prince of the tribe of Aws; Mahometanism spreading so fast, that there was scarce a house wherein there were not some who had embraced it.

The next year, being the 13th of Mahomet's mission, Masab returned to Mecca, accompanied by 73 men and two women of Medina who had professed Islamism, besides some others who were as yet unbelievers. On their arrival, they immediately sent to Mahomet, and offered him their assistance, of which he was now in great need; for his adversaries were by this time grown so powerful in Mecca, that he could not stay there much longer without imminent danger. Wherefore he accepted their proposal, and met them one night, by appointment, at al Akaba above-mentioned, attended by his uncle al Abbas; who, though he was not then a believer, wished his nephew well, and made a speech to those of Medina, wherein he told them, that as Mahomet was obliged to quit his native city, and seek an asylum elsewhere, and they had offered him their protection, they would do well not to deceive him; that if they were not firmly resolved to defend, and not betray him, they had better declare their minds, and let him provide for his safety in some other manner. Upon their protesting their sincerity, Mahomet swore to be faithful to them, on condition that they should protect him against all insults, as heartily as they would their own wives and families. They then asked him what recompence they were to expect if they should happen to be killed in his quarrel; he answered, Paradise. Whereupon they pledged their faith to him, and so returned home; after Mahomet had chosen 12 out of their number, who were to have the same authority among them as the 12 apostles of Christ had among his disciples.

Hitherto Mahomet had propagated his religion by fair means, so that the whole success of his enterprize, before his flight to Medina, must be attributed to persuasion only, and not to compulsion. For before this second oath of fealty or inauguration at al Akaba, he



**Mahomet.** had no permission to use any force at all; and in several places of the Koran, which he pretended were revealed during his stay at Mecca, he declares his business was only to preach and admonish; that he had no authority to compel any person to embrace his religion; and that, whether people believe or not, was none of his concern, but belonged solely unto God. And he was so far from allowing his followers to use force, that he exhorted them to bear patiently those injuries which were offered them on account of their faith; and, when persecuted himself, chose rather to quit the place of his birth and retire to Medina, than to make any resistance. But this great passiveness and moderation seem entirely owing to his want of power, and the great superiority of his opposers for the first 12 years of his mission; for no sooner was he enabled, by the assistance of those of Medina, to make head against his enemies, than he gave out, that God had allowed him and his followers to defend themselves against the infidels; and at length, as his forces increased, he pretended to have the divine leave even to attack them; and to destroy idolatry, and set up the true faith by the sword; finding, by experience, that his designs would otherwise proceed very slowly, if they were not utterly overthrown; and knowing, on the other hand, that innovators, when they depend solely on their own strength, and can compel, seldom run any risk; from whence, says Machiavel, it follows, that all the armed prophets have succeeded, and the unarmed ones have failed. Moses, Cyrus, Theseus, and Romulus, would not have been able to establish the observance of their institutions for any length of time, had they not been armed. The first passage of the Koran which gave Mahomet the permission of defending himself by arms, is said to have been that in the 22d chapter; after which a great number to the same purpose were revealed.

That Mahomet had a right to take up arms for his own defence against his unjust persecutors, may, perhaps, be allowed; but whether he ought afterwards to have made use of that means for the establishing of his religion, it is not so easy to determine. How far the secular power may or ought to interpose in affairs of this nature, mankind are not agreed. The method of converting by the sword gives no very favourable idea of the faith which is so propagated, and is disallowed by every body in those of another religion, though the same persons are willing to admit of it for the advancement of their own; supposing that, though a false religion ought not to be established by authority, yet a true one may; and accordingly force is almost as constantly employed in these cases by those who have the power in their hands, as it is constantly complained of by those who suffer the violence. It is certainly one of the most convincing proofs that Mahometism was no other than a human invention, that it owed its progress and establishment almost entirely to the sword; and it is one of the strongest demonstrations of the divine original of Christianity, that it prevailed against all the force and powers of the world by the mere dint of its own truth, after having stood the assaults of all manner of persecutions, as well as other oppositions, for 300 years together, and at length made the Roman emperors themselves submit thereto; after which time, indeed, this proof seems to fail, Christianity being then

established, and Paganism abolished, by public authority, which has had great influence in the propagation of the one and destruction of the other ever since. But to return.

Mahomet, having provided for the security of his companions as well as his own, by the league offensive and defensive which he had now concluded with those of Medina, directed them to repair thither, which they accordingly did; but himself with Abu Beer and Ali staid behind, having not yet received the divine permission, as he pretended, to leave Mecca. The Koreish, fearing the consequence of this new alliance, began to think it absolutely necessary to prevent Mahomet's escape to Medina; and having held a council thereon, after several milder expedients had been rejected, they came to a resolution that he should be killed; and agreed that a man should be chosen out of every tribe for the execution of this design; and that each man should have a blow at him with his sword, that the guilt of his blood might fall equally on all the tribes, to whose united power the Hashemites were much inferior, and therefore durst not attempt to revenge their kinsman's death.

This conspiracy was scarce formed, when, by some means or other, it came to Mahomet's knowledge; and he gave out that it was revealed to him by the angel Gabriel, who had now ordered him to retire to Medina. Whereupon, to amuse his enemies, he directed Ali to lie down in his place, and wrap himself up in his green cloak, which he did; and Mahomet escaped miraculously, as they pretend, to Abu Beer's house, unperceived by the conspirators, who had already assembled at the prophet's door. They, in the mean time, looking through the crevice, and seeing Ali, whom they took to be Mahomet himself, asleep, continued watching there till morning, when Ali awoke, and they found themselves deceived.

From Abu Beer's house Mahomet and he went to a cave in mount Thur, to the south-east of Mecca, accompanied only by Amer Ebn Foheirah, Abu Beer's servant, and Abd'allah Ebn Oreitah, an idolater whom they had hired for a guide. In this cave they lay hid three days, to avoid the search of their enemies; which they very narrowly escaped, and not without the assistance of some miracles than one: for some say that the Koreish were struck with blindness, so that they could not find the cave; others, that after Mahomet and his companions were got in, two pigeons laid their eggs at the entrance, and a spider covered the mouth of the cave with her web, which made them look no farther. Abu Beer, seeing the prophet in such imminent danger, became very sorrowful; whereupon Mahomet comforted him with these words, recorded in the Koran, *Be not grieved, for God is with us*. Their enemies being retired, they left the cave, and set out for Medina, by a by-road; and having fortunately, or, as the Mahometans tell us, miraculously escaped some who were sent to pursue them, arrived safely at that city; whither Ali followed them in three days, after he had settled some affairs at Mecca.

The first thing Mahomet did after his arrival at Medina, was to build a temple for his religious worship, and a house for himself, which he did on a parcel of ground which had before served to put camels

Mahomet, being securely settled at Medina, and able not only to defend himself against the insults of his enemies, but to attack them, began to send out small parties to make reprisals on the Koreish; the first party consisting of no more than nine men, who intercepted and plundered a caravan belonging to that tribe, and in the action took two prisoners. But what established his affairs very much, and was the foundation on which he built all his succeeding greatness, was the gaining of the battle of Bedr, which was fought in the second year of the Hejra, and is so famous in the Mahometan history. Some reckon no less than 27 expeditions wherein Mahomet was personally present, in nine of which he gave battle, besides several other expeditions in which he was not present. His forces he maintained partly by the contributions of his followers for this purpose, which he called by the name of *zaca*t or *alms*, and the paying of which he very artfully made one main article of his religion; and partly by ordering a fifth part of the plunder to be brought into the public treasury for that purpose, in which matter he likewise pretended to act by the divine direction.

In a few years, by the success of his arms (notwithstanding he sometimes came off by the worst) he considerably raised his credit and power. In the sixth year of the Hejra he set out with 1400 men to visit the temple of Mecca, not with any intent of committing hostilities, but in a peaceable manner. However, when he came to al Hodeibiya, which is situate partly within and partly without the sacred territory, the Koreish sent to let him know that they would not permit him to enter Mecca, unless he forced his way; whereupon he called his troops about him, and they all took a solemn oath of fealty or homage to him, and he resolved to attack the city; but those of Mecca sending Arwa Ebn Masud, prince of the tribe of Thakif, as their ambassador, to desire peace, a truce was concluded between them for ten years, by which any person was allowed to enter into league either with

Mahomet, or with the Koreish, as he thought fit. It may not be improper, to show the inconceivable veneration and respect the Mahometans by this time had for their prophet, to mention the account which the above-mentioned ambassador gave the Koreish, at his return, of their behaviour. He said he had been at the courts both of the Roman emperor and of the king of Persia, and never saw any prince so highly respected by his subjects as Mahomet was by his companions: for, whenever he made the ablution, in order to say his prayers, they ran and caught the water that he had used; and, whenever he spit, they immediately licked it up, and gathered up every hair that fell from him with great superstition.

In the seventh year of the Hejra, Mahomet began to think of propagating his religion beyond the bounds of Arabia; and sent messengers to the neighbouring princes, with letters to invite them to Mahometism. Nor was this project without some success. Khofru Parviz, then king of Persia, received his letter with great disdain, and tore it in a passion, sending away the messenger very abruptly; which when Mahomet heard, he said *God shall tear his kingdom*. And soon after a messenger came to Mahomet from Badhan king of Yaman, who was a dependent on the Persians, to acquaint him that he had received orders to send him to Khofru. Mahomet put off his answer till the next morning, and then told the messenger it had been revealed to him that night that Khofru was slain by his son Shiruyeh; adding, that he was well assured his new religion and empire should rise to as great a height as that of Khofru; and therefore bid him advise his master to embrace Mahometism. The messenger being returned, Badhan in a few days received a letter from Shiruyeh, informing him of his father's death, and ordering him to give the prophet no further disturbance. Whereupon Badhan and the Persians with him turned Mahometans.

The emperor Heraclius, as the Arabian historians assure us, received Mahomet's letter with great respect, laying it on his pillow, and dismissed the bearer honoured. And some pretend that he would have professed this new faith, had he not been afraid of losing his crown.

Mahomet wrote to the same effect to the king of Ethiopia, though he had been converted before, according to the Arab writers; and to Mokawkas, governor of Egypt, who gave the messenger a very favourable reception, and sent several valuable presents to Mahomet, and among the rest two girls, one of which, named Mary, became a great favourite with him. He also sent letters of the like purport to several Arab princes: particularly one to al Hareth Ebn Abi Shamer king of Ghassan, who returning for answer that he would go to Mahomet himself, the prophet said, *May his kingdom perish*: another to Hawdha Ebn Ali, king of Yamama, who was a Christian, and, having some time before professed Islamism, had lately returned to his former faith; this prince sent back a very rough answer, upon which Mahomet cursing him, he died soon after: and a third to al Mondar Ebn Sawa, king of Bahrein, who embraced Mahometism, and all the Arabs of that country followed his example.

The eighth year of the Hejra was a very fortunate

nate year to Mahomet. In the beginning of it, Khaled Ebn al Walid and Amru Ebn al As, both excellent soldiers, the first of whom afterwards conquered Syria and other countries, and the latter Egypt, became profelytes of Mahometism. And soon after the prophet sent 3000 men against the Grecian forces, to revenge the death of one of his ambassadors, who, being sent to the governor of Bosra on the same errand as those who went to the above-mentioned princes, were slain by an Arab, of the tribe of Ghassan, at Muta, a town in the territory of Balka in Syria, about three days journey eastward from Jerusalem, near which town they encountered. The Grecians being vastly superior in number, (for, including the auxiliary Arabs, they had an army of 100,000 men,) the Mahometans were repulsed in the first attack, and lost successively three of their generals, viz. Zeid Ebn Haretha Mahomet's freedman, Jaafar the son of Abu Taleb, and Abdallah Ebn Rawaha: but Khaled Ebn al Walid succeeding to the command, overthrew the Greeks with a great slaughter, and brought away abundance of rich spoil; on occasion of which action Mahomet gave him the title of *Seif min sayuf Allah*, "one of the swords of God."

In this year also Mahomet took the city of Mecca, the inhabitants whereof had broken the truce concluded on two years before. For the tribe of Bacr, who were confederates with the Koreish, attacking those of Khozaah, who were allies of Mahomet, killed several of them, being supported in the action by a party of the Koreish themselves. The consequence of this violation was soon apprehended; and Abu Sofian himself made a journey to Medina on purpose to heal the breach and renew the truce: but in vain; for Mahomet, glad of this opportunity, refused to see him: whereupon he applied to Abu Bacr and Ali; but they giving him no answer, he was obliged to return to Mecca as he came.

Mahomet immediately gave orders for preparations to be made, that he might surprize the Meccans while they were unprovided to receive him: in a little time he began his march thither; and by that time he came near the city, his forces were increased to 10,000 men. Those of Mecca, being not in a condition to defend themselves against so formidable an army, surrendered at discretion; and Abu Sofian saved his life by turning Mahometan. About 28 of the idolaters were killed by a party under the command of Khaled; but this happened contrary to Mahomet's orders, who, when he entered the town, pardoned all the Koreish on their submission, except only six men and four women, who were more obnoxious than ordinary, (some of them having apostatized), and were solemnly proscribed by the prophet himself; but of these no more than three men and one woman were put to death, the rest obtaining pardon on their embracing Mahometism, and one of the women making her escape.

The remainder of this year Mahomet employed in destroying the idols in and round Mecca, sending several of his generals on expeditions for that purpose, and to invite the Arabs to Islamism; wherein it is no wonder if they now met with success.

The next year, being the ninth of the Hejra, the Mahometans call the year of embassies: for the Arabs

had been hitherto expecting the issue of the war between Mahomet and the Koreish: but, so soon as that tribe, the principal of the whole nation, and the genuine descendants of Ishmael, whose prerogatives none offered to dispute, had submitted, they were satisfied that it was not in their power to oppose Mahomet; and therefore began to come in to him in great numbers, and to send embassies to make their submissions to him, both to Mecca, while he staid there, and also to Medina, whither he returned this year. Among the rest, five kings of the tribe of Hamyar professed Mahometism, and sent ambassadors to notify the same.

In the 10th year, Ali was sent into Yaman to propagate the Mahometan faith there; and, as it is said, converted the whole tribe of Hamdan in one day. Their example was quickly followed by all the inhabitants of that province, except only those of Najran, who, being Christians, chose rather to pay tribute.

Thus was Mahometism established, and idolatry rooted out, even in Mahomet's lifetime (for he died the next year,) throughout all Arabia, except only Yamama, where Moseilama, who set up also for a prophet as Mahomet's competitor, had a great party, and was not reduced till the khalifat of Abu Bacr: and the Arabs being then united in one faith, and under one prince, found themselves in a condition of making those conquests, which extended the Mahometan faith over so great a part of the world.

**MAHOMETANISM, or MAHOMETISM**, the system of religion broached by Mahomet, and still adhered to by his followers. See **MAHOMET**, and **ALCORAN**.

Mahometanism is professed by the Turks, Persians, and several nations among the Africans, and many among the East-Indians.

The Mahometans divide their religion into two general parts, faith and practice: of which the first is divided into six distinct branches; Belief in God, in his angels, in his scriptures, in his prophets, in the resurrection and final judgment, and in God's absolute decrees. The points relating to practice are, Prayer, with washings, &c. alms, fasting, pilgrimage to Mecca, and circumcision.

**I. Of the Mahometan Faith.** 1. That both Mahomet and those among his followers who are reckoned orthodox, had and continue to have just and true notions of God and his attributes, appears so plain from the Koran itself, and all the Mahometan divines, that it would be loss of time to refute those who suppose the God of Mahomet to be different from the true God, and only a fictitious deity or idol of his own creation.

2. The existence of angels, and their purity, are absolutely required to be believed in the Koran; and he is reckoned an infidel who denies there are such beings, or hates any of them, or asserts any distinction of sexes among them. They believe them to have pure and subtle bodies, created of fire; that they neither eat nor drink, nor propagate their species; that they have various forms and offices, some adoring God in different postures, others singing praises to him, or interceding for mankind. They hold, that some of them are employed in writing down the ac-



tions of men; others in carrying the throne of God, and other services.

The four angels, whom they look on as more eminently in God's favour, and often mention on account of the offices assigned them, are, Gabriel, to whom they give several titles, particularly those of the *holy spirit*, and the *angel of revelations*, supposing him to be honoured by God with a greater confidence than any other, and to be employed in writing down the divine decrees; Michael, the friend and protector of the Jews; Azrael, the *angel of death*, who separates mens souls from their bodies; and Israfil, whose office it will be to sound the trumpet at the resurrection. The Mahometans also believe, that two guardian angels attend on every man, to observe and write down his actions, being changed every day, and therefore called *al Moakkibat*, or "the angels who continually succeed one another."

The devil, whom Mahomet names *Eblis*, from his *despair*, was once one of those angels who are nearest to God's presence, called *Azazil*; and fell, according to the doctrine of the Koran, for refusing to pay homage to Adam at the command of God.

Besides angels and devils, the Mahometans are taught by the Koran to believe an intermediate order of creatures, which they call *jin* or *genii*, created also of fire, but of a grosser fabric than angels, since they eat and drink, and propagate their species, and are subject to death. Some of these are supposed to be good, and others bad, and capable of future salvation or damnation, as men are; whence Mahomet pretended to be sent for the conversion of *genii* as well as men.

3. As to the scriptures, the Mahometans are taught by the Koran, that God, in divers ages of the world, gave revelations of his will in writing to several prophets, the whole and every one of which it is absolutely necessary for a good Moslem to believe. The number of these sacred books were, according to them, 104. Of which 10 were given to Adam, 50 to Seth, 30 to Edris or Enoch, 10 to Abraham; and the other four, being the Pentateuch, the Psalms, the Gospel, and the Koran, were successively delivered to Moses, David, Jesus, and Mahomet; which last being the seal of the prophets, those revelations are now closed, and no more are to be expected. All these divine books, except the four last, they agree to be now entirely lost, and their contents unknown; though the Sabians have several books which they attribute to some of the antediluvian prophets. And of those four, the Pentateuch, Psalms, and Gospel, they say, have undergone so many alterations and corruptions, that, though there may possibly be some part of the true word of God therein, yet no credit is to be given to the present copies in the hands of the Jews and Christians. The Mahometans have also a gospel in Arabic, attributed to St Barnabas; wherein the history of Jesus Christ is related in a manner very different from what we find in the true gospels, and correspondent to those traditions which Mahomet has followed in his Koran. Of this gospel the Moriscos in Africa have a translation in Spanish; and there is, in the library of prince Eugene of Savoy, a manuscript of some antiquity, containing an Italian translation of the same gospel; made, it is to be supposed, for the use of re-

negades. This book appears to be no original forgery of the Mahometans; though they have, no doubt, interpolated and altered it since, the better to serve their purpose; and in particular, instead of the *Paraclete*, or *Comforter*, they have in this apocryphal gospel inserted the word *Periclyte*, that is, the "famous," or "illustrious;" by which they pretend their prophet was foretold by name, that being the signification of *Mohammed* in Arabic: and this they say to justify that passage of the Koran, where Jesus Christ is formally asserted to have foretold his coming, under his other name of *Ahmed*, which is derived from the same root as *Mohammed*, and of the same import. From these, or some other forgeries of the same stamp, it is that the Mahometans quote several passages, of which there are not the least footprints in the New Testament.

4. The number of the prophets, which have been from time to time sent by God into the world, amounts to no less than 224,000, according to one Mahometan tradition; or to 124,000, according to another: among whom 313 were apostles, sent with special commissions to reclaim mankind from infidelity and superstition; and six of them brought new laws or dispensations, which successively abrogated the preceding: these were Adam, Noah, Abraham, Moses, Jesus, and Mahomet. All the prophets in general, the Mahometans believe to have been free from great sins and errors of consequence, and professors of one and the same religion, that is, Islam, notwithstanding the different laws and institutions which they observed. They allow of degrees among them, and hold some of them to be more excellent and honourable than others. The first place they give to the revealers and establishers of new dispensations, and the next to the apostles.

In this great number of prophets, they not only reckon divers patriarchs and persons named in scripture, but not recorded to have been prophets, (wherein the Jewish and Christian writers have sometimes led the way,) as Adam, Seth, Lot, Ishmael, Nun, Joshua, &c. and introduce some of them under different names, as *Enoch*, *Heber*, and *Jethro*, who are called, in the Koran, *Edris*, *Hud*, and *Shoaib*; but several others whose very names do not appear in scripture (though they endeavour to find some persons there to fix them on), as Saleh, Khedr, Dhul'kehl, &c.

5. The belief of a general resurrection and a future judgment.

When a corpse is laid in the grave, they say he is received by an angel, who gives him notice of the coming of the two examiners; who are two black livid angels, of a terrible appearance, named *Monker* and *Nakir*. These order the dead person to sit upright; and examine him concerning his faith, as to the unity of God, and the mission of Mahomet: if he answer rightly, they suffer the body to rest in peace, and it is refreshed by the air of paradise; but, if not, they beat him on the temples with iron maces, till he roars out for anguish so loud, that he is heard by all from east to west, except men and *genii*. They then cast the earth on the corpse, which is gnawed and stung till the resurrection by 99 dragons, with seven heads each; or, as others say, their sins will become veno-

Mahometans, the grievous ones stinging like dragons, the smaller like scorpions, and the other like serpents: circumstances which some understand in a figurative sense.

As to the soul, they hold, that, when it is separated from the body by the angel of death, who performs his office with ease and gentleness towards the good, and with violence towards the wicked, it enters into that which they call *al berakh*, or the interval between death and the resurrection. If the departed person was a believer, they say two angels meet it, who convey it to heaven, that its place there may be assigned, according to its merit and degree. For they distinguish the souls of the faithful into three classes: the first of prophets, whose souls are admitted into paradise immediately; the second of martyrs, whose spirits, according to a tradition of Mahomet, rest in the crops of green birds, which eat of the fruits and drink of the rivers of paradise; and the third of other believers, concerning the state of whose souls before the resurrection there are various opinions.

Though some among the Mahometans have thought that the resurrection will be merely spiritual, and no more than the returning of the soul to the place whence it first came (an opinion defended by Ebn Sina, and called by some the *opinion of the philosophers*;) and others, who allow man to consist of body only, that it will be merely corporeal; the received opinion is, that both body and soul will be raised: and their doctors argue strenuously for the possibility of the resurrection of the body, and dispute with great subtilty concerning the manner of it. But Mahomet has taken care to preserve one part of the body, whatever becomes of the rest, to serve for a basis of the future edifice, or rather a haven for the souls which is to be joined to it. For he taught, that a man's body was entirely consumed by the earth, except only the bone called *al ash*, which we name the *os coccygis*, or rump-bone; and that, as it was the first formed in the human body, it will also remain uncorrupted till the last day, as a seed from whence the whole is to be renewed; and this, he said, would be effected by a forty-days rain, which God should send, and which would cover the earth to the height of 12 cubits, and cause the bodies to sprout forth like plants. Herein, also, is Mahomet beholden to the Jews; who say the same things of the bone Luz, excepting that what he attributes to a great rain, will be effected, according to them, by a dew, impregnating the dust of the earth.

The time of the resurrection the Mahometans allow to be a perfect secret to all but God alone; the angel Gabriel himself acknowledging his ignorance in this point, when Mahomet asked him about it. However, they say, the approach of that day may be known from certain signs which are to precede it. These signs they distinguish into two sorts, the lesser, and the greater.

The lesser signs are, 1. The decay of faith among men. 2. The advancing of the meanest persons to eminent dignity. 3. That a maid-servant shall become the mother of her mistress (or master;) by which is meant, either that towards the end of the world men shall be much given to sensuality, or that the Mahometans shall then take many captives. 4. Tumults and seditions. 5. A war with the Turks. 6. Great

distress in the world, so that a man, when he passes by another's grave, shall say, Would to God I were in his place. 7. That the provinces of Irak and Syria shall refuse to pay their tribute. And, 8. That the buildings of Median shall reach to Ahab, or Yahab.

The greater signs are, 1. The sun's rising in the west; which some have imagined it originally did. 2. The appearance of the beast, which shall rise out of the earth, in the temple of Mecca, or on mount Safa, or in the territory of Tayef, or some other place. This beast, they say, is to be sixty cubits high; though others, not satisfied with so small a size, will have her reach to the clouds and to heaven, when her head only is out; and that she will appear for three days, but shew only a third part of her body. They describe this monster, as to her form, to be a compound of various species; having the head of a bull, the eyes of a hog, the ears of an elephant, the horns of a stag, the neck of an ostrich, the breast of a lion, the colour of a tiger, the back of a cat, the tail of a ram, the legs of a camel, and the voice of an ass. Some say this beast is to appear three times in several places, and that she will bring with her the rod of Moses and the seal of Solomon; and, being so swift that none can overtake or escape her, will with the first strike all the believers on the face, and mark them with the word *numen*, i. e. believer; and with the latter will mark the unbelievers on the face likewise, with the word *Caser*, i. e. infidel, that every person may be known for what he really is. They add, that the same beast is to demonstrate the vanity of all religions except Islam, and to speak Arabic. All this stuff seems to be the result of a confused idea of the beast in the Revelations. 3. War with the Greeks, and the taking Constantinople by 70,000 of the posterity of Isaac, who shall not win that city by force of arms, but the walls shall fall down while they cry out, *There is no God but God, God is most great!* As they are dividing the spoil, news will come to them of the appearance of Antichrist; whereupon they shall leave all, and return back. 4. The coming of Antichrist, whom the Mahometans call *Masih al Dajjal*, i. e. the false or lying Christ, and simply *al Dajjal*. He is to be one-eyed, and marked on the forehead with the letters C. F. R. signifying *Caser*, or infidel. They say that the Jews give him the name of Messiah Ben David; and pretend he is to come in the last days, and to be lord both of land and sea, and that he will restore the kingdom to them. 5. The descent of Jesus on earth. They pretend that he is to descend near the white tower to the east of Damascus, when the people are returned from the taking of Constantinople: that he is to embrace the Mahometan religion, marry a wife, get children, kill Antichrist; and at length die after 40 years, or, according to others, 24 years continuance on earth. Under him, they say, there will be great security and plenty in the world, all hatred and malice being laid aside; when lions and camels, bears and sheep, shall live in peace, and a child shall play with serpents unhurt. 6. War with the Jews; of whom the Mahometans are to make a prodigious slaughter, the very trees and stones discovering such of them as hide themselves, except only the tree called *gharkad*, which is the tree of the Jews. 7. The eruption of Gog and Magog, or, as they are called in the east, *Tajuj* and

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*Majui*; of whom many things are related in the Koran and the traditions of Mahomet. These barbarians, they tell us, having passed the lake of Tiberias, which the vanguard of their vast army will drink dry, will come to Jerusalem, and there greatly distress Jesus and his companions; till, at his request, God will destroy them, and fill the earth with their carcasses, which, after some time, God will send birds to carry away, at the prayers of Jesus and his followers. Their bows, arrows, and quivers, the Moslems will burn for seven years together; and at last, God will send a rain to cleanse the earth and to make it fertile. 8. A smoke, which shall fill the whole earth. 9. An eclipse of the moon. Mahomet is reported to have said, that there would be three eclipses before the last hour; one to be seen in the east, another in the west, and the third in Arabia. 10. The returning of the Arabs to the worship of Allat and al Uzza, and the rest of their ancient idols, after the decease of every one in whose heart there was faith equal to a grain of mustard-seed, none but the very worst of men being left alive. For God, they say, will send a cold odorous wind, blowing from Syria Damascena, which shall sweep away the souls of all the faithful, and the Koran itself, so that men will remain in the grossest ignorance for 100 years. 11. The discovery of a vast heap of gold and silver by the retreating of the Euphrates, which will be the destruction of many. 12. The demolition of the Caaba, or temple of Mecca, by the Ethiopians. 13. The speaking of beasts and inanimate things. 14. The breaking out of fire in the province of Hejaz; or, according to others, in Yaman. 15. The appearance of a man of the descendants of Kahtan, who shall drive men before him with his staff. 16. The coming of the Mohdi, or director; concerning whom Mahomet prophesied, that the world should not have an end till one of his own family should govern the Arabians, whose name should be the same with his own name, and whose father's name should also be the same with his father's name; and who should fill the earth with righteousness. This person the Shiites believe to be now alive, and concealed in some secret place till the time of his manifestation; for they suppose him no other than the last of the twelve Imams, named Mahomet Abu'lkasem, as their prophet was; and the son of Hassan al Askari, the eleventh of that succession. He was born at Serrmanrai, in the 255th year of the Hgira. From this tradition, it is to be presumed, an opinion pretty current among the Christians took its rise, that the Mahometans are in expectation of their prophet's return. 17. A wind which shall sweep away the souls of all who have but a grain of faith in their hearts, as has been mentioned under the tenth sign.

These are the greater signs, which, according to their doctrine, are to precede the resurrection, but still leave the hour of it uncertain; for the immediate sign of its being come will be the first blast of the trumpet, which they believe will be sounded three times. The first they call the *blast of conflagration*; at the hearing of which all creatures in heaven and earth shall be struck with terror, except those whom God shall please to exempt from it. The effects attributed to this first sound of the trumpet are very wonderful: for they say, the earth will be shaken, and not only all buildings,

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but the very mountains levelled; that the heavens shall melt, the sun be darkened, the stars fall, on the death of the angels, who, as some imagine, hold them suspended between heaven and earth; and the sea shall be troubled and dried up, or, according to others, turned into flames, the sun, moon, and stars being thrown into it: the Koran, to express the greatness of the terror of that day, adds, that women who give suck shall abandon the care of their infants, and even the camels which have gone ten months with young (a most valuable part of the subsistence of that nation) shall be utterly neglected. A farther effect of this blast will be that concourse of beasts mentioned in the Koran, though some doubt whether it be to precede the resurrection or not. They who suppose it will precede, think that all kinds of animals, forgetting their respective natural fierceness and timidity, will run together into one place, being terrified by the sound of the trumpet and the sudden shock of nature.

The Mahometans believe that this first blast will be followed by a second, which they call the *blast of examination*; by which all creatures both in heaven and earth shall die or be annihilated, except those which God shall please to exempt from the common fate; and this, they say, shall happen in the twinkling of an eye, nay in an instant; nothing surviving except God alone, with paradise and hell, and the inhabitants of those two places, and the throne of glory. The last who shall die will be the angel of death.

Forty years after this will be heard the *blast of resurrection*, when the trumpet shall be sounded the third time by Israfil, who, together with Gabriel and Michael will be previously restored to life, and, standing on the rock of the temple of Jerusalem, shall, at God's command, call together all the dry and rotten bones, and other dispersed parts of the bodies, and the very hairs, to judgment. This angel, having, by the divine order, set the trumpet to his mouth, and called together all the souls from all parts, will throw them into his trumpet, from whence, on his giving the last sound, at the command of God, they will fly forth like bees, and fill the whole space between heaven and earth, and then repair to their respective bodies, which the opening earth will suffer to arise; and the first who shall so arise, according to a tradition of Mahomet, will be himself. For this birth the earth will be prepared by the rain above-mentioned, which is to fall continually for 40 years, and will resemble the seed of a man, and be supplied from the water under the throne of God, which is called *living water*; by the efficacy and virtue of which the dead bodies shall spring forth from their graves, as they did in their mother's womb, or as corn sprouts forth by common rain, till they become perfect; after which breath will be breathed into them, and they will sleep in their sepulchres till they are raised to life at the last trumpet.

When those who have risen shall have waited the limited time, the Mahometans believe God will at length appear to judge them; Mahomet undertaking the office of intercessor, after it shall have been declined by Adam, Noah, Abraham, and Jesus, who shall beg deliverance only for their own souls. They say, that on this solemn occasion God will come in the clouds surrounded by angels, and will produce the books wherein the actions of every person are recorded by their guardian



guardian angels, and will command the prophets to bear witness against those to whom they have been respectively sent. Then every one will be examined concerning all his words and actions uttered and done by him in this life; not as if God needed any information in these respects, but to oblige the person to make public confession and acknowledgment of God's justice. The particulars of which they shall give an account, as Mahomet himself enumerated them, are, of their time, how they spent it; of their wealth, by what means they acquired it, and how they employed it; of their bodies, wherein they exercised them; of their knowledge and learning, what use they made of them. To the questions we have mentioned each person shall answer, and make his defence in the best manner he can, endeavouring to excuse himself by casting the blame of his evil deeds on others; so that a dispute shall arise even between the soul and the body, to which of them their guilt ought to be imputed: the soul saying, *O Lord, my body I received from thee; for thou createdst me without a hand to lay hold with, a foot to walk with, an eye to see with, or an understanding to apprehend with, till I came and entered into this body; therefore punish it eternally, but deliver me.* The body, on the other side, will make this apology: *O Lord, thou createdst me like a flock of wood, having neither hand that I could lay hold with, nor foot that I could walk with, till this soul, like a ray of light, entered into me, and my tongue began to speak, my eye to see, and my foot to walk; therefore punish it eternally, but deliver me.* But God will propound to them the following parable of the blind man and the lame man, which, as well as the preceding dispute, was borrowed by the Mahometans from the Jews. A certain king, having a pleasant garden, in which were ripe fruits, set two persons to keep it, one of whom was blind, and the other lame; the former not being able to see the fruit, nor the latter to gather it: the lame man, however, seeing the fruit, persuaded the blind man to take him upon his shoulders, and by that means he easily gathered the fruit; which they divided between them. The lord of the garden coming some time after, and inquiring after his fruit, each began to excuse himself: the blind man said he had no eyes to see with; and the lame man, that he had no feet to approach the trees. But the king, ordering the lame man to be set on the blind, passed sentence on and punished them both. And in the same manner will God deal with the body and the soul. As these apologies will not avail on that day, so it will be in vain for any one to deny his evil actions; since men and angels, and his own members, nay, the very earth itself, will be ready to bear witness against him.

At this examination, they also believe, that each person will have the book wherein all the actions of his life are written delivered to him: which books the righteous will receive into their right hand, and read with great pleasure and satisfaction; but the ungodly will be obliged to take them, against their wills, in their left, which will be bound behind their backs, their right hand being tied up to their necks.

To show the exact justice which will be observed on this great day of trial, the next thing they describe is the balance, wherein all things shall be weighed. They say it will be held by Gabriel; and that it is of so vast

a size, that its two scales, one of which hangs over paradise, and the other over hell, are capacious enough to contain both heaven and hell. Though some are willing to understand what is said in the Koran concerning this balance allegorically, and only as a figurative representation of God's equity; yet the more ancient and orthodox opinion is, that they are to be taken literally; and since words and actions, being mere accidents, are not capable of being themselves weighed, they say that the books wherein they are written will be thrown into the scales, and according as those wherein the good or evil actions are recorded shall preponderate, sentence will be given: those whose balances laden with good works shall be heavy, will be saved; but those whose balances are light, will be condemned. Nor will any one have cause to complain that God suffers any good action to pass unrewarded, because the wicked for the good they do have their reward in this life, and therefore can expect no favour in the next.

This examination being past, and every one's works weighed in a just balance, that mutual retaliation will follow, according to which every creature will take vengeance one of another, or have satisfaction made them for the injuries which they have suffered. And, since there will then be no other way of returning like for like, the manner of giving this satisfaction will be by taking away a proportional part of the good works of him who offered the injury, and adding it to those of him who suffered it. Which being done, if the angels (by whose ministry this is to be performed) say, *Lord, we have given to every one his due, and there remaineth of this person's good works so much as equalleth the weight of an ant,* God will, of his mercy, cause it to be doubled unto him, that he may be admitted into paradise; but if, on the contrary, his good works be exhausted, and there remain evil works only, and there be any who have not yet received satisfaction from him, God will order that an equal weight of their sins be added unto his, that he may be punished for them in their stead, and he will be sent to hell laden with both. This will be the method of God's dealing with mankind. As to brutes, after they shall have likewise taken vengeance of one another, he will command them to be changed into dust; wicked men being reserved to more grievous punishment, so that they shall cry out, on hearing this sentence passed on the brutes, *Would to God that we were dust also.* As to the geni, many Mahometans are of opinion, that such of them as are true believers, will undergo the same fate as the irrational animals, and have no other reward than the favour of being converted into dust; and for this they quote the authority of their prophet.

The trials being over, and the assembly dissolved, the Mahometans hold, that those who are to be admitted into paradise will take the right-hand way, and those who are destined to hell fire will take the left; but both of them must first pass the bridge called in Arabic *al Sirat*, which they say is laid over the middle of hell, and describe to be finer than a hair, and sharper than the edge of a sword; so that it seems very difficult to conceive how any one shall be able to stand upon it: for which reason, most of the sect of the Motazalites reject it as a fable; though the orthodox think it a sufficient proof of the truth of this article, that it was seriously affirmed by him who never asserted a falsehood,

meaning their prophet : who, to add to the difficulty of the passage, has likewise declared, that this bridge is beset on each side with briars and hooked thorns : which will however be no impediment to the good; for they shall pass with wonderful ease and swiftness, like lightning, or the wind, Mahomet and his Moslems leading the way; whereas the wicked, what with the slipperiness and extreme narrowness of the path, the intangling of the thorns, and the extinction of the light which directed the former to paradise, will soon miss their footing, and fall down headlong into hell, which is gaping beneath them.

As to the punishment of the wicked, the Mahometans are taught, that hell is divided into seven storics or apartments, one below another, designed for the reception of as many distinct classes of the damned. The first, which they call *Jehennam*, they say, will be the receptacle of those who acknowledged one God, that is, the wicked Mahometans; who, after having there been punished according to their demerits, will at length be released. The second, named *Ladha*, they assign to the Jews; the third, named *al Hotama*, to the Christians; the fourth, named *al Sair*, to the Sabians; the fifth, named *Sakar*, to the Magians; the sixth, named *al Jabim*, to the idolaters; and the seventh, which is the lowest and worst of all, and is called *al Hawyat*, to the hypocrites, or those who outwardly professed some religion, but in their hearts were of none. Over each of these apartments they believe there will be set a guard of angels, 19 in number; to whom the damned will confess the just judgment of God, and beg them to intercede with him for some alleviation of their pain, or that they may be delivered by being annihilated.

Mahomet has, in his Koran and traditions, been very exact in describing the various torments of hell, which, according to him, the wicked will suffer both from intense heat and excessive cold. We shall, however, enter into no detail of them here; but only observe, that the degrees of these pains will also vary in proportion to the crimes of the sufferer, and the apartment he is condemned to; and that he who is punished the most lightly of all will be shod with shoes of fire, the fervour of which will cause his skull to boil like a cauldron. The condition of these unhappy wretches, as the same prophet teaches, cannot be properly called either *life* or *death*; and their misery will be greatly increased by their despair of being ever delivered from that place, since, according to that frequent expression in the Koran, *they must remain therein for ever*. It must be remarked, however, that the infidels alone will be liable to eternity of damnation; for the Moslems, or those who have embraced the true religion, and have been guilty of heinous sins, will be delivered thence after they shall have expiated their crimes by their sufferings. The time which these believers shall be detained there, according to a tradition handed down from their prophet, will not be less than 900 years, nor more than 7000. And, as to the manner of their delivery, they say that they shall be distinguished by the marks of prostration on those parts of their bodies with which they used to touch the ground in prayer, and over which the fire will therefore have no power; and that, being known by this characteristic, they will be released by the mercy

of God, at the intercession of Mahomet and the blessed; whereupon those who shall have been dead, will be restored to life, as has been said; and those whose bodies shall have contracted any footsins or filth from the flames and smoke of hell, will be immersed in one of the rivers of paradise, called the *river of life*, which will wash them whiter than pearls.

The righteous, as the Mahometans are taught to believe, having surmounted the difficulties, and passed the sharp bridge abovementioned, before they enter paradise, will be refreshed by drinking at the *pond* of their prophet, who describes it to be an exact square of a month's journey in compass; its water, which is supplied by two pipes from *al Cawthar*, one of the rivers of paradise, being whiter than milk or silver, and more odiferous than musk, with as many cups set around it as there are stars in the firmament; of which water whoever drinks will thirst no more for ever. This is the first taste which the blessed will have of their future and now near-approaching felicity.

Though paradise be so very frequently mentioned in the Koran, yet it is a dispute among the Mahometans whether it be already created, or to be created hereafter; the Motazalites and some other sectaries asserting, that there is not at present any such place in nature, and that the paradise which the righteous will inhabit in the next life will be different from that from which Adam was expelled. However, the orthodox profess the contrary, maintaining that it was created even before the world, and describe it, from their prophet's traditions, in the following manner.

They say it is situated above the seven heavens (or in the seventh heaven), and next under the throne of God; and, to express the amenity of the place, tell us, that the earth of it is of the finest wheat-flour, or of the purest musk, or, as others will have it, of *jasfron*: that its stones are pearls and jacinths, the walls of its buildings enriched with gold and silver, and that the trunks of all its trees are of gold: among which the most remarkable is the tree called *Tuba*, or the tree of happiness. Concerning this tree, they fable, that it stands in the palace of Mahomet, though a branch of it will reach to the house of every true believer; that it will be laden with pomegranates, grapes, dates, and other fruit, of surprising bigness, and of tastes unknown to mortals. So that, if a man desire to eat of any particular kind of fruit, it will immediately be presented him; or, if he choose flesh, birds ready dressed will be set before him, according to his wish. They add, that the boughs of this tree will spontaneously bend down to the hand of the person who would gather of its fruits, and that it will supply the blessed not only with food, but also with silken garments, and beasts to ride on ready saddled and bridled, and adorned with rich trappings, which will burst forth from its fruits; and that this tree is so large, that a person, mounted on the fleetest horse, would not be able to gallop from one end of its shade to the other in 100 years.

As plenty of water is one of the greatest additions to the pleasantness of any place, the Koran often speaks of the rivers of paradise as a principal ornament thereof: some of these rivers, they say, flow with water,

some

some with milk, some with wine, and others with honey; all taking their rife from the root of the tree Tuba.

But all these glories will be eclipsed by the resplendent and ravishing girls of paradise, called, from their large black eyes, *Hur al ayn*, the enjoyment of whose company will be a principal felicity of the faithful. These, they say, are created, not of clay, as mortal women are, but of pure milk; being, as their prophet often affirms in his Koran, free from all natural impurities, defects, and inconveniences incident to the sex, of the strictest modesty, and secluded from public view in pavilions of hollow pearls, so large, that as some traditions have it, one of them will be no less than four parasangs (or, as others say, 60 miles) long, and as many broad.

The name which the Mahometans usually give to this happy mansion, is *al Jannat*, or the garden; and sometimes they call it, with an addition, *Jannat al Ferdas*, "the garden of paradise;" *Jannat Eden*, "the garden of Eden," (tho' they generally interpret the word *Eden*, not according to its acceptation in Hebrew, but according to its meaning in their own tongue, wherein it signifies a *settled or perpetual habitation*;) *Jannat al Mawa*, "the garden of abode;" *Jannat al Naim*, "the garden of pleasure;" and the like: by which several appellations, some understand so many different gardens, or at least places of different degrees of felicity, (for they reckon no less than 100 such in all,) the very meanest whereof will afford its inhabitants so many pleasures and delights, that one would conclude they must even sink under them, had not Mahomet declared, that, in order to qualify the blessed for a full enjoyment of them, God will give to every one the abilities of 100 men.

6. God's absolute decree and predestination both of good and evil. The orthodox doctrine is, that whatever hath or shall come to pass in this world, whether it be good, or whether it be bad, proceedeth entirely from the divine will, and is irrevocably fixed and recorded from all eternity in the preserved table. God having secretly predetermined not only the adverse and prosperous fortune of every person in this world, in the most minute particulars, but also his faith or infidelity, his obedience or disobedience, and consequently his everlasting happiness or misery after death; which fate or predestination it is not possible by any foresight or wisdom, to avoid.

Of this doctrine Mahomet makes great use in his Koran for the advancement of his designs; encouraging his followers to fight without fear, and even desperately, for the propagation of their faith, by representing to them, that all their caution could not avert their inevitable destiny, or prolong their lives for a moment; and deterring them from disobeying or rejecting him as an impostor, by setting before them the danger they might thereby incur of being, by the just judgment of God, abandoned to seduction, hardness of heart, and a reprobate mind, as a punishment for their obduracy.

II. *Religious practice*. 1. The first point is *prayer*, under which are also comprehended those legal washings or purifications which are necessary preparations thereto.

Of these purifications there are two degrees, one

called *ghoss*, being a total immersion or bathing of the body in water; and the other called *wudu*, (by the Persians, *abdest*), which is the washing of their faces, hands, and feet, after a certain manner. The first is required in some extraordinary cases only, as after having lain with a woman, or been polluted by emission of seed, or by approaching a dead body; women also being obliged to it after their courtes or childbirth. The latter is the ordinary ablution in common cases, and before prayer, and must necessarily be used by every person before he can enter upon that duty. It is performed with certain formal ceremonies, which have been described by some writers, but much easier apprehended by seeing them done, than by the best description.

That his followers might be more punctual in this duty, Mahomet is said to have declared, that *the practice of religion is founded on cleanliness*, which is the *one half of the faith*, and the *key of prayer*, without which it will not be heard by God. That these expressions may be the better understood, *al Ghazali* reckons four degrees of purification; of which the first is the cleansing of the body from all pollution, filth, and excrements; the second, the cleansing of the members of the body from all wickedness and unjust actions; the third, the cleansing the heart from all blameable inclinations and odious vices; and the fourth, the purging a man's secret thoughts from all affections which may divert their attendance on God; adding, that the body is but as the outward shell, in respect to the heart, which is as the kernel.

Circumcision, though it be not so much as once mentioned in the Koran, is yet held, by the Mahometans, to be an ancient divine institution, confirmed by the religion of Islam, and, though not so absolutely necessary but that it may be dispensed with in some cases, yet highly proper and expedient. The Arabs used this rite for many ages before Mahomet, having probably learned it from Ishmael, tho' not only his descendants, but the Hamyarites and other tribes practised the same. The Ishmaelites, we are told, used to circumcise their children, not on the eighth day, as is the custom of the Jews, but when about 12 or 13 years old, at which age their father underwent that operation; and the Mahometans imitate them so far as not to circumcise children before they may be able at least distinctly to pronounce that profession of their faith, *There is no God but God; Mahomet is the apostle of God*; but pitch on what age they please for the purpose, between 6 and 16, or thereabouts.

Prayer was by Mahomet thought so necessary a duty, that he used to call it *the pillar of religion*, and *the key of paradise*; and when the Thakhties, who dwelt at Tayef, lending, in the ninth year of the Hegira, to make their submission to the prophet, after the keeping of their favourite idol had been denied them, begged at least, that they might be dispensed with as to their saying of their appointed prayers, he answered, *That there could be no good in that religion wherein was no prayer*.

That so important a duty, therefore, might not be neglected, Mahomet obliged his followers to pray five times every 24 hours, at certain stated times; viz.

1. In the morning before sun-rise: 2. When noon is past,



paft, and the fun begins to decline from the meridian : 3. In the afternoon, before fun-fet : 4. In the evening, after fun-fet, and before day be fhut in; and, 5. After the day is fhut in, and before the firft watch of the night. For this infitution he pretended to have received the divine command from the throne of God himfelf, when he took his night-journey to heaven; and the obferving of the fated times of prayer is frequently infisted on in the Koran, though they be not particularly prefcribed therein. Accordingly, at the aforefaid times, of which public notice is given by the Moeddhins, or Criers, from the fleeples of their mosques, (for they ufe no bells,) every confcientious Moflem prepares himfelf for prayer, which he performs either in the mosque or any other place, provided it be clean, after a prefcribed form, and with a certain number of praifes or ejaculations, (which the more ferupulous count by a ftring of beads) and ufe certain poftures of worfhip; all which have been particularly fet down and defcribed, tho' with fome few miftakes, by other writers, and ought not to be abridged, unlefs in fome fpecial cafes, as on a journey, on preparing for battle, &c.

For the regular performance of the duty of prayer among the Mahometans, befides the particulars abovementioned, it is alfo requifite that they turn their faces, while they pray, towards the temple of Mecca; the quarter where the fame is fituated, being, for that reafon, pointed out within their mosques by a nich, which they call *al Mehrah*; and without, by the fituation of the doors opening into the galleries of the fleeples: there are, alfo, tables calculated for the ready finding out their Kebab, or part towards which they ought to pray, in places where they have no other diretion.

2. *Alms* are of two forts, *legal* and *voluntary*. The *legal alms* are of indifpenfable obligation, being commanded by the law, which directs and determines both the portion which is to be given, and of what things it ought to be given; but the *voluntary alms* are left to every one's liberty, to give more or lefs, as he fhall fee fit. The former kind of alms fome think to be properly called *zacad*, and the latter *sadakat*; tho' this name be alfo frequently given to the legal alms. They are called *zacad*, either becaufe they *increase* a man's ftore by drawing down a bleffing thereon, and produce in his foul the virtue of liberality; or becaufe they *purify* the remaining part of one's fubftance from pollution, and the foul from the filth of avarice; and *sadakat*, becaufe they are a proof of a man's fincerity in the worfhip of God. Some writers have called the legal alms *tithe*, but improperly, fince in fome cafes they fall fhort, and in others exceed that proportion.

3. *Fafting* is a duty of fo great moment, that Mahomet ufed to fay it was the *gate of religion*, and that the *odour of the mouth of him who fafteth is more grateful to God than that of myft*; and al Ghazali reckons *fafting one fourth part of the faith*. According to the Mahometan divines, there are three degrees of fafting: 1. The reftaining the belly and other parts of the body from fatisfying their lults; 2. The reftaining the ears, eyes, tongue, hands, feet, and other members, from fin; and, 3. The fafting of the heart from worldly cares, and reftaining the thoughts from every thing befides God.

The Mahometans are obliged, by the exprefs command of the Koran, to faft the whole month of Ramadan, from the time the new-moon firft appears, till the appearance of the next new moon; during which time they muft abftain from eating, drinking, and women, from day-break till night or fun-fet. And this injunftion they obferve fo ftrictly, that, while they faft, they fuffer nothing to enter their mouths, or other parts of their body, fceeming the faft broken and null, if they fmill perfumes, take a clyfter or injection, bathe, or even purpofely fwallow their fpittle; fome being fo cautious, that they will not open their mouths to fpeak, left they fhould breathe the air too freely: the faft is alfo deemed void, if a man kills or touch a woman, or if he vomit defignedly. But after fun-fet they are allowed to refrefh themfelves, and to eat and drink, and enjoy the company of their wives till day-break; though the more rigid begin the faft again at midnight. This faft is extremely rigorous and mortifying when the month of Ramadan happens to fall in fummer, (for the Arabian year being lunar, each month runs thro' all the different feafons in the courfe of 33 years) the length and heat of the days making the obfervance of it much more difficult and uneasy than in winter.

The reafon given why the month of Ramadan was pitched on for this purpofe is, that on that month the Koran was fent down from heaven. Some pretend, that Abraham, Mofes, and Jefus, received their refpective revelations in the fame month.

4. The pilgrimage to Mecca is fo neceffary a point of practice, that, according to a tradition of Mahomet, he who dies without performing it may as well die a Jew or a Chriftian; and the fame is exprefly commanded in the Koran.

The temple of Mecca ftands in the midft of the city, and is honoured with the title of *Majid al e'Araram*, i. e. the *holy* or *inviolable temple*. What is principally revered in this place, and gives fandiity to the whole, is a fquare ftone building, called the *CAABA*; (fee that article).

To this temple every Mahometan, who has health and means fufficient, ought, once at leaft in his life, to go on pilgrimage; nor are women excufed from the performance of this duty. The pilgrims meet at different places near Mecca, according to the different parts from whence they come, during the months of Shawal and Dhu'lkaada; being obliged to be there by the beginning of Dhu'lhajja; which month, as its name imports, is peculiarly fet apart for the celebration of this folemnity.

At the place above-mentioned the pilgrims properly commence fuch; when the men put on the Ithram or fared habit, which confifts only of two woollen wrappers, one wrapped about their middle to cover their privities, and the other thrown over their fhoulders, having their heads bare, and a kind of flippers which cover neither the heel nor the inftep, and fo enter the fared territory in their way to Mecca. While they have this habit on, they muft neither hunt nor fowl, (though they are allowed to fifh;) which precept is fo punctually obferved, that they will not kill even a louse or flea if they find them on their bodies: there are fome noxious animals, however, which they have permiffion to kill during the pilgrimage, as kites,

ravens,

Mahometanism.

ravens, scorpions, mice, and dogs given to bite. During the pilgrimage, it behoves a man to have a constant guard over his words and actions; to avoid all quarrelling or ill-language, all converse with women, and all obscene discourse; and to apply his whole attention to the good work he is engaged in.

The pilgrims, being arrived at Mecca, immediately visit the temple; and then enter on the performance of the prescribed ceremonies, which consist chiefly in going in procession round the Caaba, in running between the mounts Safa and Merwa, in making the station on mount Arafat, and slaying the victims, and shaving their heads in the valley of Mina.

In compassing the Caaba, which they do seven times, beginning at the corner where the black stone is fixed, they use a short quick pace the three first times they go round it, and a grave ordinary pace the four last; which, it is said, was ordered by Mahomet, that his followers might shew themselves strong and active to cut off the hopes of the infidels, who gave out that the immoderate heats of Medina had rendered them weak. But the aforesaid quick pace they are not obliged to use every time they perform this piece of devotion, but only at some particular times. So often as they pass by the black stone, they either kiss it, or touch it with their hand and kiss that.

The running between Safa and Merwa is also performed seven times, partly with a slow pace, and partly running: for they walk gravely till they come to a place between two pillars; and there they run, and afterwards walk again; sometimes looking back, and sometimes stopping, like one who had lost something, to represent Hagar seeking water for her son; for the ceremony is said to be as ancient as her time.

On the ninth of Dhu'l-hajja, after morning-prayer, the pilgrims leave the valley of Mina, whither they come the day before; and proceed in a tumultuous and rushing manner to mount Arafat, where they stay to perform their devotions till sun-set: then they go to Mozdalifa, an oratory between Arafat and Mina; and there spend the night in prayer and reading the Koran. The next morning by day-break they visit *al Massier al Karam*, or "the sacred monument;" and, departing thence before sun-rise, haste by Batn Mohasser to the valley of Mina, where they throw seven stones at three marks or pillars, in imitation of Abraham, who, meeting the devil in that place, and being by him disturbed in his devotions, or tempted to disobedience when he was going to sacrifice his son, was commanded by God to drive him away by throwing stones at him; though others pretend this rite to be as old as Adam, who also put the devil to flight in the same place and by the same means.

This ceremony being over, on the same day, the tenth of Dhu'l-hajja, the pilgrims slay their victims in the said valley of Mina; of which they and their friends eat part, and the rest is given to the poor. These victims must be either sheep, goats, kine, or camels; males, if of either of the two former kinds; and females, if of either of the latter; and of a fit age. The sacrifices being over, they shave their heads and cut their nails, burying them in the same place; after which the pilgrimage is looked on as completed: though they again visit the Caaba, to take their leave of that sacred building.

Mahometans, Maidens.

MAHOMETANS, those who believe in the religion and divine mission of Mahomet. See MAHOMET, MAHOMETANISM, and ALKORAN.

MAIDEN, an instrument for beheading criminals.

Of the use and form of this instrument Mr Pennant gives the following account. "It seems to have been confined to the limits of the forest of Hardwick, or the 18 towns and hamlets within its precincts. The time when this custom took place is unknown; whether Earl Warren, lord of this forest, might have established it among the sanguinary laws then in use against the invaders of the hunting rights, or whether it might not take place after the woollen manufactures at Halifax began to gain strength, is uncertain. The last is very probable; for the wild country around the town was inhabited by a lawless set, whose depredations on the cloth-tenters might soon fluster the efforts of infant industry. For the protection of trade, and for the greater terror of offenders by speedy execution, this custom seems to have been established, so as at last to receive the force of law, which was, 'That if a felon be taken within the liberty of the forest of Hardwick, with goods stolen out, or within the said precincts, either hand-haband, back-berand, or confession'd, to the value of thirteen-pence halfpenny, he shall, after three market-days or meeting-days within the town of Halifax, next after such his apprehension, and being condemned, be taken to the gibbet, and there have his head cut from its body.'

"The offender had always a fair trial; for as soon as he was taken, he was brought to the lord's bailiff at Halifax: he was then expoled on the three markets (which here were held thrice in a week), placed in a stocks, with the goods stolen on his back, or, if the theft was of the cattle kind, they were placed by him; and this was done both to strike terror into others, and to produce new informations against him. The bailiff then summoned four freeholders of each town within the forest to form a jury. The felon and prosecutors were brought face to face; the goods, the cow, or horse, or whatsoever was stolen, produced. If he was found guilty, he was remanded to prison, had a week's time allowed for preparation, and then was conveyed to this spot, where his head was struck off by this machine. I should have premised, that if the criminal, either after apprehension, or in the way to execution, could escape out of the limits of the forest (part being close to the town), the bailiff had no farther power over him; but if he should be caught within the precincts at any time after, he was immediately executed on his former sentence.

"This privilege was very freely used during the reign of Elizabeth: the records before that time were lost. Twenty-five suffered in her reign, and at least twelve from 1623 to 1650; after which I believe the privilege was no more exerted.

"This machine of death is now destroyed; but I saw one of the same kind in a room under the parliament-house at Edinburgh, where it was introduced by the Regent Morton, who took a model of it as he passed through Halifax, and at length suffered by it himself. It is in form of a painter's easel, and about ten feet high: at four feet from the bottom is a cross bar, on which the felon lays his head, which is kept down by another

Maidstone  
Mail.

another placed above. In the inner edges of the frame are grooves; in these is placed a sharp ax, with a vast weight of lead, supported at the very summit with a peg; to that peg is fastened a cord, which the executioner cutting, the ax falls, and does the affair effectually, without suffering the unhappy criminal to undergo a repetition of strokes, as has been the case in the common method. I must add, that if the sufferer is condemned for stealing a horse, or a cow, the string is tied to the beast, which, on being whipped, pulls out the peg, and becomes the executioner."

MAIDSTONE, a town of Kent, in England, seated on the river Medway, a branch of which runs through it. It is a large, populous, and agreeable place; and the assizes for the county are held here. It is a corporation, has a free school, and sends two members to parliament. E. Long. o. 37. N. Lat. 51. 20.

MAIENNE, a considerable, handsome, and populous town in France, with the title of a duchy; seated on a river of the same name, in W. Long. o. 35. N. Lat. 48. 18.

MAIGNAN (Emanuel), a religious minim, and one of the greatest philosophers of his age, was born of an ancient and noble family at Thoulouse in 1601. Like the famous Pascal, he became a complete mathematician without the assistance of a teacher; and filled the professor's chair at Rome in 1636, where, at the expense of Cardinal Spada, he published his book *De Perspectiva Horaria*. He returned to Thoulouse in 1650, and was created provincial: the king, who in 1660 entertained himself with the machines and curiosities in his cell, made him offers by Cardinal Mazarine, to draw him to Paris; but he humbly desired to spend the remainder of his days in a cloyster. He published a course of philosophy, 4 vols 8vo, at Thoulouse; to the second edition of which he added two treatises, one against the vortices of Descartes, and the other on the speaking trumpet invented by Sir Samuel Morland. He is said to have studied even in his sleep, his very dreams being employed in theorems, the demonstrations of which would awaken him with joy. He died in 1676.

MAJESTY, a title given to kings, which frequently serves as a term of distinction.—Thus, the emperor is called *Sacred Majesty*, *Imperial Majesty*, and *Cæsarian Majesty*: The king of France is called *His Most Christian Majesty*; and when he treats with the emperor, the word *sacred* is added: And the king of Spain is termed *His Most Catholic Majesty*. With respect to other kings, the name of the kingdom is added; as *His Britannic Majesty*, *His Polish Majesty*, &c. Formerly princes were more sparing in giving titles, and more modest in claiming them: before the reign of Charles V. the king of Spain had only the title of *Highness*; and before that of Henry VIII. the kings of England were only addressed under the titles of *Grace* and *Highness*.

MAIL INDUCTION, an ancient custom for the priest and people of country villages to go in procession to some adjoining wood on a May-day morning; and return in a kind of triumph, with a May-pole, boughs, flowers, garlands, and other tokens of the spring. This *May-game*, or rejoicing at the coming of the spring, was for a long time observed, and still

is in some parts of England; but there was thought to be too much heathen vanity in it, that it was condemned and prohibited within the diocese of Lincoln, by the good old bishop Grotthead.

MAIL (MACULA), a coat of mail, so called from the French *maille*, which signifies a square figure, or the hole of a net: so *maille de boubergerois* was a coat of mail, because the links or joints in it resemble the squares of a net.

MAIL is likewise used for the leather bag wherein letters are carried by the post.

Action of MAILS and Duties, in Scots law. See LAW, p. (90), § 7. and p. (102), § 20.

MAIM, MAIHEM, or *Mayhem*, in law, a wound by which a person loses the use of a member that might have been a defence to him; as when a bone is broken, a foot, hand, or other member cut off, or an eye put out; though the cutting off an ear or nose, or breaking the hinder-teeth, was formerly held to be no maim. A maim by castration was anciently punished with death, and other maims with loss of member for member; but afterwards they were only punished by fine and imprisonment. It is now enacted by the statute 22 & 23 Car. II. that if any person, from malice, aforethought, shall disable any limb or member of any of the king's subjects with an intent to disfigure him, the offender, with his aiders and abettors, shall be guilty of felony without benefit of clergy; though no such attainder shall corrupt the blood, or occasion forfeiture of lands, &c.

MAIMBOURG (Louis), born at Nanci in 1610, became a Jesuit in 1626; and acquired reputation as a teacher, but yet more by the many histories which he published. The Jansenists criticised his history of Arianism, and that of the *Iconoclasts*; and his history of Calvinism, published in 1681, stirred up a violent paper-war against him, the operations whereof he left entirely to his enemies, without giving himself any trouble offensively or defensively. He was degraded by the general of the Jesuits, on account of his having declared too boldly in favour of the Gallican church against the Ultramontains. He retired into the abbey of St Victor, where he died in 1686.

He ought not to be confounded with *Theodore Maimbourg* his cousin; who embraced Calvinism, afterwards returned to the Romish church, returned back to the reformed religion, embraced Socinianism, and died at London about the year 1693, after having published some works.

MAIMONIDES (Moses), or MOSES THE SON OF MAIMON, a celebrated rabbi, called by the Jews *the eagle of the doctors*, was born of an illustrious family at Cordova in Spain, in 1131. He is commonly named *Moses Egyptius*, because he settled in Egypt, where he spent his whole life in quality of physician to the sultan. Here he opened a school, which was soon filled with pupils from all parts; from Alexandria and Damascus especially, whose proficiency under him spread his fame all over the world. He was no less eminent in philosophy, mathematics, and divinity, than in medicine. Casaubon affirms it may be truly said of him, as Pliny of old said of Diodorus Siculus, that "he was the first of his tribe who ceased to be a trifler." It would be tedious to enumerate all the works of Maimonides; some

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some were written originally in Arabic, but are now extant only in Hebrew translations. "Thofe (fays Collier,) who defire to learn the doctrine and the canon law contained in the Talmud, may read Maimonides's compendium of it in good Hebrew, in his book intitled *Iad*; wherein they will find great part of the fables and impertinences in the Talmud entirely difcarded. But the *More Nevochim* is the moft valued of all his works; defigned to explain the obfcure words, phrafes, metaphors, &c. in Scripture, which, when literally interpreted, have either no meaning or appear abfurd.

MAIN, an epithet ufually applied by failors to whatever is principal, as oppofed to whatever is inferior or fecondary. Thus the main land is ufed in contradiftinction to an ifland or peninfula; and the main-maft, the main-wale, the main-keel, and the main-hatchway, are in like manner diftinguifhed from the fore and mizen masts, the channel-wales, the falfe keel, and the fore and after hatchways, &c.

MAINOUR, MANOUR, or MEINOUR, (from the French *manier*, i. e. *manu tradere*), in a legal fenfe denotes the thing that a thief taketh away or ftealeth: As to be taken with the *mainour*, (*Pl. Cor.* fol. 179.) is to be taken with the thing ftolen about him: And again (*fol.* 194.) it was prefented, that a thief was delivered to the fheriff or vifcount, together with the *mainour*: And again, (*fol.* 186.) if a man be indicted, that he feloniously ftole the goods of another, where, in truth, they are his own goods, and the goods he brought into the court as the *mainour*; and if it be demanded of him, what he faith to the goods, and he difclaim them; though he be acquitted of the felony, he fhall lofe the goods: And again, (*fol.* 149.) if the defendant were taken with the *manour*, and the *manour* were carried to the court, they, in ancient times would arraign him upon the *manour*, without any appeal or indictment. *Covel. See Blackft. Comment.* Vol. III. 71. Vol. IV. 303.

MAINPRIZE. See *Falfe IMPRISONNEMENT*.

The writ of mainprize, *manu capio*, is a writ directed to the fheriff, (either generally, when any man is imprifoned for a bailable offence, and bail hath been refufed; or fpecially, when the offence or caufe of commitment is not properly bailable below), commanding him to take fureties for the prifoner's appearance, ufually called *mainpernors*, and to fet him at large. Mainpernors differ from bail, in that a man's bail may imprifon, or furrender him up before the ftipulated day of appearance; mainpernors can do neither, but are barely fureties for his appearance at the day: bail are only fureties that the parties be anfwerable for the fpecial matter for which they ftipulate, mainpernors are bound to produce him to anfwer all charges whatever. See *HABEAS CORPUS*.

MAINTENANCE, in law, bears a near relation to BARRETRY; being an officious intermeddling in a fuit that no way belongs to one, by maintaining or affifting either party with money or otherwife, to profecute or defend it: a practice that was greatly encouraged by the firft introduction of ufes. This is an offence againft public juftice, as it keeps alive ftrengh and contention, and perverts the remedial procefs of the law into an engine of oppreffion. And therefore, by the Roman law, it was a fpecies of the *crimen falſi*,

to enter into any confederacy, or do any aft to fupport another's law-fuit, by money, witneffes, or patronage. A man may, however, maintain the fuit of his near kinfman, fervant, or poor neighbour, out of charity and compaffion, with impunity. Otherwife the punifhment by common law is fine and imprifonment; and by the ftatute 32 Hen. VIII. c. 9. a forfeiture of 101.

MAINTENON (Madame de), a French lady of extraordinary fortune, defended from an ancient family, and whofe proper name was *France: Daubigne*, was born in 1635. Her parents by miffortunes being ill able to fupport her, ſhe fell to the care of her mother's relations; to efcape which ftate of dependence, ſhe was induced to marry that famous old buffoon the abbe Scarron, who fubfifted himſelf only on a penſion allowed him by the court for his wit and parts. She lived with him many years, which Voltaire makes no fcruple to call the happieft years of her life; but when he died in 1660, ſhe found herſelf as indigent as ſhe was before her marriage. Her friends indeed endeavoured to get her husband's penſion continued to her, and prefented fo many petitions to the king about it, all beginning with "The widow Scarron moft humbly prays your majeſty's, &c." that he was quite weary of them, and has been heard to exclaim, "Muſt I always be pelted with the widow Scarron?" At laſt, however, through the recommendation of Madame de Montefpan, he fettled a much larger penſion on her, with a genteel apology for making her wait fo long; and afterward made choice of her to take care of the education of the young duke of Maine, his fon by Madame de Montefpan. The letters ſhe wrote on this occaſion charmed the king, and were the origin of her advancement; her perſonal merit effected all the reſt. He bought her the lands of Maintenon, the only eſtate ſhe ever had; and finding her pleaſed with the acquiſition, called her publicly *Madam de Maintenon*; which was of great ſervice to her in her good fortune, by releaſing her from the ridicule attending that of Scarron. Her elevation was to her only a retreat; the king came to her apartment every day after dinner, before and after ſupper, and continued there till midnight: here he did buſineſs with his miniſters, while Madame de Maintenon, employed in reading or needle-work, never ſhewed any deſire to talk of ſtate-affairs, and carefully avoided all appearance of cabal or intrigue; ſhe did not even make uſe of her power to dignify her own relations. About the latter end of the year 1685, Lewis XIV. married her, he being then in his 43th and ſhe in her 50th year; and that piety with which ſhe inſpired the king to make her a wife inſtead of a miſtreſs, became by degrees a fettled diſpoſition of mind. She prevailed on Lewis to found a religious community at St Cyr, for the education of 300 young ladies of quality; and here ſhe frequently retired from that melancholy of which the complaints ſo pathetically in one of her letters, and which few ladies will ſuppoſe ſhe ſhould be liable to in ſuch an elevated ſituation. But, as M. Voltaire ſays, if any thing could ſhew the vanity of ambition, it would certainly be this letter. Madame de Maintenon could have no other uſeſneſs than the uniformity of her manner of living with a great king; and this made her once ſay to the count Daubigné her brother, "I can hold it no lon-

ger; I wish I was dead." The answer he made to her was, "You have then a promise to marry the Almighty?" Lewis, however, died before her in 1715; when she retired wholly to St Cyr, and spent the rest of her days in acts of devotion; and what is most surprising is, that her husband left no certain provision for her, recommending her only to the duke of Orleans. She would accept no more than a pension of 80,000 livres, which was punctually paid her till she died in 1719. A collection of her letters has been published, and translated into English; from which familiar intercourse her character will be better known than from description.

**MAJOR**, in the art of war, the name of several officers of very different ranks and functions.

**MAJOR** of a *regiment of Foot*, the next officer to the lieutenant-colonel, generally promoted from the eldest captain: he is to take care that the regiment be well exercised, to see it march in good order, and to rally it in case of being broke in action: he is the only officer among the infantry that is allowed to be on horseback in time of action, that he may the more readily execute the colonel's orders.

**MAJOR** of a *regiment of Horse*, as well as foot, ought to be a man of honour, integrity, understanding, courage, activity, experience, and address: he should be master of arithmetic, and keep a detail of the regiment in every particular: he should be skilled in horsemanship, and ever attentive to his business: one of his principal functions is, to keep an exact roster of the officers for duty: he should have a perfect knowledge in all the military evolutions, as he is obliged by his post to instruct others, &c.

**Town-MAJOR**, the third officer in order in a garrison, and next to the deputy-governor. He should understand fortification, and has a particular charge of the guards, rounds, patrols, and sentinels.

**Brigade-MAJOR**, is a particular officer appointed for that purpose only in camp: he goes every day to head-quarters to receive orders from the adjutant-general: there they write exactly whatever is dictated to them: from thence they go and give the orders, at the place appointed for that purpose, to the different majors or adjutants of the regiments which compose that brigade, and regulate with them the number of officers and men which each are to furnish for the duty of the army; taking care to keep an exact roster, that one may not give more than another, and that each march in their tour: in short, the major of brigade is charged with the particular detail in his own brigade, in much the same way as the adjutant-general is charged with the general detail of the duty of the army. He sends every morning to the adjutant-general an exact return, by battalion and company, of the men of his brigade missing at the retreat, or a report expressing that none are absent: he also mentions the officers absent with or without leave.

As all orders pass through the hands of the majors of brigade, they have infinite occasions of making known their talents and exactness.

**MAJOR** of *Artillery*, is also the next officer to the lieutenant-colonel. His post is very laborious, as the whole detail of the corps particularly rests with him; and for this reason all the non-commissioned officers are subordinate him, as his title of *serjeant-major* im-

ports: in this quality they must render him an exact account of every thing which comes to their knowledge, either regarding the duty or wants of the artillery and fliers. He should possess a perfect knowledge of the power of artillery, together with all its evolutions. In the field he goes daily to receive orders from the brigade-major, and communicates them with the parole to his superiors, and then dictates them to the adjutant. He should be a very good mathematician, and be well acquainted with every thing belonging to the train of artillery, &c.

**MAJOR** of *Engineers*, commonly with us called *sub-director*, should be very well skilled in military architecture, fortification, gunnery, and mining. He should know how to fortify in the field, to attack and defend all sorts of posts, and to conduct the works in a siege, &c. See **ENGINEER**.

**Aid-MAJOR**, is on sundry occasions appointed to act as major, who has a pre-eminence above others of the same denomination. Our horse and foot-guards have their guidons, or second and third majors.

**Serjeant-MAJOR**, is a non-commissioned officer, of great merit and capacity, subordinate to the adjutant, as he is to the major. See **SERGEANT**.

**Drum-MAJOR**, is not only the first drummer in the regiment, but has the same authority over his drummers as the corporal has over his squad. He instructs them in their different beats; is daily at orders with the serjeants, to know the number of drummers for duty. He marches at their head when they beat in a body. In the day of battle, or at exercise, he must be very attentive to the orders given him, that he may regulate his beats according to the movements ordered.

**Fife-MAJOR**, is he that plays the belt on that instrument, and has the same authority over the fifers as the drum-major has over the drummers. He teaches them their duty, and appoints them for guards, &c.

**MAJOR**, in law, a person who is of age to manage his own affairs. By the civil law a man is not a major till the age of 25 years; in England, he is a major at 21, as in Normandy at 20.

**MAJOR**, in logic, is understood of the first proposition of a regular syllogism. It is called *major*, because it has a more extensive sense than the minor proposition, as containing the principal term. See **LOGIC**.

**MAJOR** and *Minor*, in music, are applied to concords which differ from each other by a semi-tone. See **CONCORD**.

**Major tone** is the difference between the fifth and fourth; and major semi-tone the difference between the major fourth and the third. The major tone surpasses the minor by a comma.

**MAJOR-Demo**, an appellation formerly given to the steward or master of the king's household.

**MAJOR** (John), a scholastic divine and historian, was born at Haddington, in the province of East Lothian in Scotland. It appears from some passages in his writings, that he resided a while both at Oxford and Cambridge. He went to Paris in 1493, and studied in the college of St Barbe, under the famous John Boulac. Thence he removed to that of Montacute, where he began to study divinity under the celebrated Standouk. In the year 1498, he was entered of the college of Navarre. In 1505, he was created doctor divinity; returned to Scotland in 1519, and taught theology

Major,  
Majorca.

theology during several years in the university of St Andrews. But at length, being disgusted with the quarrels of his countrymen, he went back to Paris, and resumed his lectures in the college of Montacute, where he had several pupils, who afterwards became men of great eminence. About the year 1530, he returned once more to Scotland, and was chosen professor of theology at St Andrew's, of which he afterwards became provost; and there died in 1547, aged 78. His logical treatises form one immense folio; his commentary on Aristotle's physics makes another; and his theological works amount to several volumes of the same size. The masks of crude and useless disquisition, were the admiration of his contemporaries. A work, less prized in his own age, was to make him known to posterity. His book *De Gestis Scotorum*, was first published at Paris by Badius Ascensius, in the year 1521. He rejects in it some of the fictions of former historians; and would have had greater merit if he had rejected more. He intermingles the history of England with that of Scotland; and has incurred the censure of some partial writers, for giving an authority to the authors of the former nation, which he refuses to those of his own. Bede, Caxton, and Froissard, were exceedingly useful to him. What does the greatest honour to this author is, the freedom with which he has censured the rapacity and indolence of ecclesiastics, and the strain of ridicule with which he treats the pope's supremacy. The style in which he wrote does not deserve commendation. Bishop Spotiswood calls it *Sorbonnic and barbarous*.

MAJORCA, an island of the Mediterranean, lying between Yvica on the west and Minorca on the east. These three islands were anciently called *Baleares*, supposed to be from the skill of their inhabitants in slinging, for which they were very remarkable. Originally they belonged to the Carthaginians; but during the wars of that people with the Romans, they seem to have regained their liberty. In 122 B. C. they were subdued by Metellus the Roman consul, who treated the inhabitants with such cruelty, that out of 30,000 he scarce left 1000 alive. He then built two cities on Majorca; one called *Palma*, now *Majorca*, to the east; the other to the west, named *Pollentia*, now no longer in being. The island continued subject to the Romans, and to the nations who over-ran the western part of the empire, for many ages. At last it was subdued by the Moors about the year 800. By them the island was put in a much better condition than it ever was before or since. The Moors being very industrious, and also populous, surrounded the whole coast with fortifications, that is, with a kind of towers and lines between them; cultivated every spot in the island that was not either rock or sand; and had no fewer than 15 great towns, whereas now there are not above three. Neither was it at all difficult for the Moorish monarch to bring into the field an army much superior in number to the inhabitants that are now upon it, taking in all ranks, sexes, and ages. In 1229, the island was subdued by the king of Arragon, who established in it a new kingdom feudatory to that of Arragon, which was again destroyed in 1341 by the same monarchs; and ever since, the island hath been subject to Spain, and hath entirely lost its importance. It is about 60 miles long, and 45 broad. The air is clear

and temperate, and, by its situation, the heat in summer is so qualified by the breezes, that it is by far the most pleasant of all the islands in the Mediterranean. There are some mountains; but the country is generally flat, and of such an excellent soil, that it produces great quantities of corn as good in its kind as any in Europe. Oil, wine, and salt, are very plentiful, as also black cattle and sheep; but deer, rabbits, and wild-fowl, abound so much, that they alone are sufficient for the subsistence of the inhabitants. There are no rivers, but a great many springs and wells, as well as several good harbours. The inhabitants are robust, active, and good seamen.

MAJORCA, a handsome, large, rich, and strong town, in the island of the same name, with a bishop's see. It contains about 6000 houses, and 22 churches, besides the cathedral. The squares, the cathedral, and the royal palace, are magnificent structures. A captain-general resides there, who commands the whole island; and there is a garrison against the incursion of the Moors. It was taken by the English in 1706; but was retaken in 1715, since which time it has been in the hands of the Spaniards. It is seated on the south-west part of the island, where there is a good harbour, 70 miles north-east of Yvica, 120 south-east of Barcelona, 140 east of Valencia, and 300 from Madrid. E. Long 2. 55. N. Lat. 39. 36.

MAIRE (Streights le), a passage to Cape Horn, situated between Terra del Fuego and Staten island; which, being discovered by Le Maire, obtained his name. It is now, however, less made use of than formerly, ships going round Staten Island as well as Terra del Fuego.

MAITLAND (John), Lord Thyrlestone, chancellor of Scotland, was the son of Richard Maitland of Lethingtoun, and brother to secretary Lethingtoun. He was born in the year 1545, educated in Scotland, and was afterwards sent to France to study the law. On his return to his native country, he commenced advocate; in which profession his abilities became so eminently conspicuous, that in the year 1584, he was made secretary of state to king James VI. and, on the death of the earl of Arran, the year following, created lord high chancellor of Scotland.

The chancellor's power and influence created him many enemies among the Scots nobility, who made several attempts to destroy him, but without success. In 1589, he attended the king on his voyage to Norway, where his bride, the princess of Denmark, was detained by contrary wind. The marriage was immediately consummated, and they returned with the queen to Copenhagen, where they spent the ensuing winter. During their residence in Denmark, the chancellor became intimately acquainted with the celebrated Tycho Brahe.

Towards the end of the year 1592, the chancellor incurred the queen's displeasure, for refusing to relinquish his lordship of Musselburgh, which he claimed as being a part of Dumfermline. He absented himself for some time from court; but was at length restored to favour, and died of a lingering illness in the year 1595, much regretted by the king. Spotiswood and Johnston give him the character of a man of great learning and political abilities. His epigrams are printed in *Del. Poet. Scot.* vol. ii.

Majorca  
||  
Maitland.



MAIZE, or INDIAN CORN. See ZEA.

MAKI. See LEMUR.

MALABAR, the name given to a great part of the west coast of the peninsula, on this side of the Ganges, from the kingdom of Baglala to Cape Comorin, or only from the north extremity of the kingdom of Canara as far as Cape Comorin. It is bounded by the mountains of Balligate on the east; by Decan on the north; and on the west and south is washed by the Indian sea.

MALACCA, the most southerly part of the great peninsula beyond the Ganges, is about 600 miles in length, and contains a kingdom of the same name. It is bounded by the kingdom of Siam on the north; by the bay of Siam and the Indian ocean, on the east; and by the streights of Malacca, which separate it from the island of Sumatra, on the south-west. This country is more to the south than any other in the East Indies; and comprehends the towns and kingdoms of Patan, Pahan, Igohor, Pera, Queda, Borkelon, Ligor; and to the north the town and kingdom of Tanassery, where the Portuguese formerly carried on a great trade. This last either does or did belong to the king of Siam. The people of Malacca are in general subject to the Dutch, who possess all the strong places on the coast, and compel them to trade on their own terms, excluding all other nations of Europe from having any commerce with the natives.

The Malays are governed by feudal laws. A chief, who has the title of *king* or *sultan*, issues his commands to his great vassals, who have other vassals in subjection to them in a similar manner. A small part of the nation live independent, under the title of *oranicai* or *noble*, and sell their services to those who pay them best; while the body of the nation is composed of slaves, and live in perpetual servitude.

The generality of these people are restless, fond of navigation, war, plunder, emigrations, colonies, desperate enterprizes, adventures, and gallantry. They talk incessantly of their honour, and their bravery; whilst they are universally considered by those with whom they have intercourse, as the most treacherous, ferocious people on earth. This ferocity, which the Malays qualify under the name of *courage*, is so well known to the European companies who have settlements in the Indies, that they have universally agreed in prohibiting the captains of their ships who may put into the Malay islands, from taking on board any seamen from that nation, except in the greatest distress, and then on no account to exceed two or three. It is not in the least uncommon for an handful of these horrid savages suddenly to embark, attack a vessel by surprise, massacre the people, and make themselves master of her. Malay batteaux, with 24 or 30 men, have been known to board European ships of 30 or 40 guns, in order to take possession of them, and murder with their poignards great part of the crew. Those, who are not slaves, go always armed: they would think themselves disgraced if they went abroad without their poignards, which they call *crit*. As their lives are a perpetual round of agitation and tumult, they cannot endure the long flowing garments in use among the other Asiatics. Their habits are exactly adapted to their shapes, and loaded with a multitude

of buttons, which fasten them close to their bodies.

The country possessed by the Malays is in general very fertile. It abounds with odoriferous woods, such as the aloes, the sandal, and the cassia. The ground is covered with flowers of the greatest fragrance, of which there is a perpetual succession throughout the year. There are abundance of mines of the most precious metals, said to be richer even than those of Brazil or Peru, and in some places are mines of diamonds. The sea also abounds with excellent fish, together with ambergrease, pearls, and those delicate birds-nests so much in request in China, formed in the rocks with the spawn of fishes, and the foam of the sea, by a species of small-sized swallow peculiar to those seas. These are of such an exquisite flavour, that the Chinese for a long time purchased them for their weight in gold, and still buy them at an excessive price. See BIRDS-NESTS.

Notwithstanding all this plenty, however, the Malays are miserable. The culture of the lands, abandoned to slaves, is fallen into contempt. These wretched labourers, dragged incessantly from their rustic employments by their restless masters, who delight in war and maritime enterprizes, have never time or resolution to give the necessary attention to the labouring of their grounds; of consequence the lands for the most part are uncultivated, and produce no kind of grain for the subsistence of the inhabitants. The fago tree indeed supplies in part the defect of grain. It is a species of the palm-tree, which grows naturally in the woods to the height of about 20 or 30 feet; its circumference being sometimes from five to six. Its ligneous bark is about an inch in thickness, and covers a multitude of long fibres, which being interwoven one with another envelope a mass of a gummy kind of meal. As soon as this tree is ripe, a whitish dust, which transpires thro' the pores of the leaves, and adheres to their extremities, indicates that the trees are in a state of maturity. The Malays then cut them down near the root, divide them into several sections, which they split into quarters: they then scoop out the mass of mealy substance, which is enveloped by and adheres to the fibres; they dilute it in pure water, and then pass it through a straining bag of fine cloth, in order to separate it from the fibres. When this paste has lost part of its moisture by evaporation, the Malays throw it into a kind of earthen vessel of different shapes, where they allow it to dry and harden. Their palate is wholesome nourishing food, and preserves for many years.

MALACCA, the capital of the country of the same name, is situated in a flat country close to the sea. The walls and fortifications are founded on a solid rock, and are carried up to a great height; the lower part of them is washed by the sea at every tide, and on the land-side is a wide canal or dike, cut from the sea to the river, which makes it an island. In 1641 it was taken from the Portuguese by the Dutch, since which time it has continued in their possession. In this city there are a great many broad streets; but they are very badly paved. The houses are tolerably well built, and some of them have gardens behind or on one side. The inhabitants consist of a few Dutch, many Malaysians, Moors, Chinese, and other Indians, who are kept in awe by a fortress, which is separated from

**Malachi** from the city by a river, and by good walls and bastions, as well as by strong gates, and a draw-bridge that is on the eastern side. The city is well situated for trade and navigation. E. Long. 102. 2. N. Lat. 2. 12.

**MALACHI**, or the prophecy of **MALACHI**, a canonical book of the Old Testament, and the last of the 12 lesser prophets. Malachi prophesied about 300 years before Christ, reproving the Jews for their wickedness after their return from Babylon, charging them with rebellion, sacrilege, adultery, profaneness, and infidelity; and condemning the priests for being scandalously careless in their ministry: at the same time not forgetting to encourage the pious few, who, in that corrupt age, maintained their integrity. This prophet distinctly points at the Messiah, who was suddenly to come to his temple, and to be introduced by Elijah the prophet, that is, by John the Baptist, who came in the spirit and power of Elias, or Elijah.

**MALACIA**, in medicine, is a languishing disorder incident to pregnant women, in which they long sometimes for one kind of food and sometimes for another, and eat it with extraordinary greediness.

**MALACOPTERYGEOUS**, among ichthyologists, an appellation given to such fishes as have the rays of their fins bony, but not pointed or sharp at the extremities like those of *anacanthopterygeous* fishes.

**MALACOSTOMOUS** FISHES, those destitute of teeth in the jaws, called in English *leather-mouthed*, as the tench, carp, bream, &c.

**MALAGA**, an ancient, rich, and strong town of Spain, in the kingdom of Grenada, with two castles, a bishop's see, and a good harbour, which renders it a trading place. It is frequented by the English and Dutch, who bring their vessels there to load them with fruits and wine. It is seated on the Mediterranean sea, at the foot of a craggy mountain. E. Long. 4. 56. N. Lat. 36. 51.

**MALAGMA**, a cataplasm. See **CATAPLASM**.

**MALDIVIA** ISLANDS, a cluster of small islands in the Indian ocean, 500 miles south west of the continent of the island of Ceylon. They are about 1000 in number, and are very small; extending from the second degree of south latitude to the seventh degree north latitude. They are generally black low lands, surrounded by rocks and sands. The natives are of the same complexion with the Arabians, profess the Mahometan religion, and are subject to one sovereign. The channels between the islands are very narrow, and some of them are fordable. They produce neither rice, corn, nor herbage; but the natives live upon coconuts, and other fruits, roots, and fish. They have little or nothing to barter with, unless the shells called *courays*, or *blackmore's teeth*, with which they abound; and these serve instead of small coin in many parts of India.

**MALDONAT** (John), a Spanish Jesuit born in 1534, was accused of heresy, and of procuring a fraudulent will in seducing the president de St Andre at Paris to bequeath his estate to the Jesuits. Peter Gondi acquitted him of the first charge, and the parliament of Paris of the other. He retired after these troubles to Bourges, but went to Rome by order of pope Gregory XIII. to take care of the publication of the Septuagint; and there, finishing his commen-

tary on the gospels in 1582, he died in the beginning of the following year. He wrote, besides, Commentaries on Jeremiah, Baruch, Ezekiel, and Daniel; a treatise on the sacraments, on grace, on original sin; and several other pieces printed at Paris in 1677, in folio. His style is clear, lively, and easy. He does not fervently follow the scholastic divines; but is pretty free, and sometimes singular, in his sentiments.

**MALE**, among zoologists, that sex of animals which has the parts of generation situated externally. See **SEX** and **GENERATION**.

The term *male* has also, from some similitude to that sex in animals, been applied to several inanimate things; thus we say, a male flower, a male screw, &c. See **MAS PLANTA**, **MASCULUS FLOI**, and **SCREW**; also **FEMALE** and **FLOS**.

**MALEBRANCHE** (Nicholas), an eminent French metaphysician, the son of Nicholas Malebranche, secretary to the French king, was born in 1638, and admitted into the congregation of the oratory in 1660. He at first applied himself to the study of languages and history; but afterwards meeting with Des Cartes's *Treatise of Man*, he gave himself up entirely to the study of philosophy. In 1699, he was admitted an honorary member of the Royal Academy of Sciences at Paris. Notwithstanding he was of a delicate constitution, he enjoyed a pretty good state of health till his death, which happened in 1715, at the age of 77. Father Malebranche read little, but thought a great deal. He despised that kind of philosophy which consists only in knowing the opinions of other men, since a person may know the history of other men's thoughts without thinking himself. He could never read ten verses together without disgust. He meditated with his windows shut, in order to keep out the light, which he found to be a disturbance to him. His conversation turned upon the same subjects as his books; but was mixed with so much modesty and deference to the judgment of others, that it was extremely and universally desired. His books are famous; particularly his *Recherche de la Verite*, i. e. Search after truth: his design in which is, to point to us the errors in which we are daily led by our senses, imagination, and passions; and to prescribe a method for discovering the truth, which he does, by starting the notion of seeing all things in God. And hence he is led to think and speak merely of human knowledge, either as it lies in written books, or in the book of nature, compared with that light which displays itself from the ideal world; and by attending to which, with pure and disengaged minds, he supposes knowledge to be most easily had. The fineness of this author's sentiments, together with his fine manner of expressing them, made every body admire his genius and abilities; but he has generally passed for a visionary philosopher. Mr Locke, in his examination of Malebranche's opinion of seeing all things in God, styles him an acute and ingenious author; and tells us, that there are "a great many very fine thoughts, judicious reasonings, and uncommon reflections, in his *Recherche*." But Mr Locke, in that piece, endeavours to refute the chief principles of his system. He wrote many other pieces besides what we have mentioned, all tending some way or other to confirm his main system, established in the

Male,  
Male-  
branche.

Malherbe

Mallet.

*Recherche*, and to clear it from the objections which were brought against it, or from the consequence which were deduced from it: and if he has not attained what he aimed at in these several productions, he has certainly shown great abilities, and a vast force of genius.

**MALHERBE** (Francis de), the best French poet of his time, was born at Caen about the year 1556, of a noble and ancient family. He quitted Normandy at 17 years of age; and went into Provence, where he attached himself to the family of Henry Angouleme, the natural son of king Henry II. and was in the service of that prince till he was killed by Altoviti in 1586. At length cardinal de Perron, being informed of his merit and abilities, introduced him to Hen. IV. who took him into his service. After that monarch's death, queen Mary de Medicis settled a pension of 500 crowns upon our poet, who died at Paris in 1628. The best and most complete edition of his poetical works is that of 1666, with Menage's remarks. Malherbe so far excelled all the French poets who preceded him, that Boileau considers him as the father of French poetry: but he composed with great difficulty, and put his mind on the rack, in correcting what he wrote. He was a man of a singular humour, blunt in his behaviour, and without religion. When the poor used to promise him, that he would pray to God for him, he answered them, that "he did not believe they could have any great interest in heaven, since they were left in such a bad condition upon earth; and that he should be better pleased if the duke de Luynes, or some other favourite, had made him the same promise." He would often say that "the religion of gentlemen was that of their prince." During his last sickness he had much ado to resolve to confess to a priest; for which he gave this facetious reason, that "he never used to confess but at Easter." And some few moments before his death, when he had been in a lethargy two hours, he awaked on a sudden to reprove his landlady, who waited on him, for using a word that was not good French; saying to his confessor who reprimanded him for it, that "he could not help it, and he would defend the purity of the French language to the last moment of his life.

**MALIGNANT**, among physicians, a term applied to diseases of a very dangerous nature, and generally infectious; such are the dysentery, hospital-fever, &c. in their worst stages.

Malignity among physicians signifies much the same with contagion. See **CONTAGION**.

**MALL**, *SEA-MALL*, or *Sea-mew*, in ornithology. See **LARUS**.

**MALLARD**, in ornithology. See **ANAS**.

**MALLEABLE**, a property of metals whereby they are capable of being extended under the hammer.

**MALLENDERS**, in farrery. See there, § xxxiii.

**MALLET**, (David, Esq;) a North-Briton, was tutor to the duke of Montrose, and to his brother lord George Graham; and became secretary to the late prince of Wales. He married a lady of very considerable fortune, and was made keeper of the book of entries for ships in the port of London. He died in 1765.

He was the editor of a new and complete edition

of lord Bacon's works, to which he prefixed a life of that great man; and published the philosophical works of the late lord Bolinbroke, agreeable to his lordship's last will and testament. His dramatic pieces are, 1. *Eurydice*, a tragedy. 2. *Mutapha*, a tragedy. 3. *Alfred*, a masque; written in conjunction with Mr James Thomson, author of the *Seasons*. *Britannia*, a masque, 1775. 5. *Elvira*, a tragedy, altered from *La Motte*; who founded this play on the famous story of *Agnes de Castro*, which Camoens has so beautifully introduced in his *Lusiad*.—Mr Mallet's tragedy was acted with moderate applause at Drury-Lane play-house in January 1763. The indifferent success it met with may, in part, be ascribed to the unlucky juncture in which it appeared; at a time when party-prejudice ran high against the Scottish nation, on account of the unpopular administration of the earl of Bute, to whom *Elvira* was dedicated.

Mr Mallet's other works are collected in 3 vols 12mo; among which the most considerable are, 1. That sweet ballad intitled *William and Margaret*. 2. *The Excursion*, a poem in two cantos. 3. *Amyntor and Theodora*, or the *Hermit*.—This last piece was originally intended for the stage, but the author chose afterwards to alter his plan. There was likewise an additional collection of poems by the author, published in 1762, in a thin volume octavo, consisting of small pieces on several occasions.

**MALLEVILLE** (Claude de), a French poet, born at Paris, was one of the first members of the French academy, and gained a prize from Voiture and other ingenious men. He became secretary to M. de Bassompierre, to whom he performed important services while he was in prison; and with the rewards he received for them he purchased the place of secretary to the king. He was likewise secretary to the French academy, and died in 1647. He wrote sonnets, stanzas, elegies, epigrams, songs, madrigals, and a paraphrase on some of the *Psalms*. His sonnets are most esteemed.

**MALLICOLLO**, one of the new Hebrides islands in the south-sea, and the most considerable of them all next to *Espiritu Santo*. It is 18 leagues long from south-east to north-west; its greatest breadth, which is at the south-east end, is eight leagues; the north-west end is two-thirds its breadth, and narrower in the middle one-third. This contraction is occasioned by a wide and deep bay on the south-west side. It appears to be very fertile, and well inhabited; the land on the sea-coast is rather low, and lies with a greater slope from the hills which are in the middle of the island: latitude 16 deg. 28 min. south; 167 deg. 56 min. east. On inquiring of the natives the name of this island, they were answered that it was Mallicollo, which has a near resemblance to Manicollo, the name which Quiros received for it 160 years before. He did not indeed visit the island, but had his intelligence from the natives.

The south coast, which was most attentively examined by captain Cook, is luxuriantly clothed with wood and other vegetables, from the sea-shore to the very summits of the hills. To the north-west, the country is less woody, but more agreeably intersected by lawns, some of which appeared to be cultivated. The vegetable productions of this country seemed to be

Mallet

Mallicollo.



Mallicollo. be in great variety; cocoa-nuts, bread-fruit, bananas, sugar-canes, yams, eddoes and turmeric: but captain Cook thought the fruits here not so good as at the Society and Friendly Isles. Hogs, and common poultry, are their domestic animals; and as the frequent squeaking of pigs was heard in the woods, it was concluded that the former are in considerable numbers here. A brace of Tahitian puppies was given them, with a view to stock the country with that species of animal: these they received with strong signs of satisfaction. The woods appeared to be inhabited by many species of birds.

Here was caught a shark, which measured nine feet in length, on which the ship's company feasted with great relish: this shark, when cut open, was found to have the bony point of an arrow sticking in its head, having been shot quite through the skull. The wound was healed so perfectly, that not the smallest vestige of it appeared on the outside: a piece of the wood still remained sticking to the bony point, as well as a few fibres with which it had been tied on; but both the wood and the fibres were so rotted, as to crumble into dust at the touch. Two large reddish fish of the sea-bream kind were likewise caught, on which most of the officers and some of the petty officers dined the next day. The night following every one who had eaten of them was seized with violent pains in the head and bones, attended with a scorching heat all over the skin, and numbness in the joints; even such hogs and dogs as had partaken of these fish, gave strong symptoms of being poisoned: one hog, who had eaten of the garbage, swelled to a great size, and died at night: several dogs were affected in the same manner; they groaned most piteously, had violent reachings, and could hardly drag their limbs along. These fish were supposed to have been of the same sort with those which Quirós mentions to have produced similar effects on board his ship, and which he calls *pargos*, which is the Spanish name for the sea-bream. Perhaps these fish are not always poisonous; but, like many species in the West and East-Indies, may acquire that quality by feeding on poisonous vegetables: which conclusion is supported by the circumstance of the intestines have been found to be more poisonous than the rest. The effects of this poison on the officers continued for near a fortnight, during which time their pains returned every night, their teeth were loose, and their gums and palate excoriated.

The natives of Mallicollo are described as the most ugly, ill-proportioned people imaginable, and in every respect different from the other islanders in the South-Sea: they are of a very dark colour, and diminutive size; with long heads, flat faces, and monkey countenances; their hair, in general, black or brown, short and curly, but not quite so soft and woolly as that of a negro. Their beards are very strong, crisp, and bushy, and generally black and short. But what serves greatly to increase their natural deformity is, a custom which they have of wearing a belt, or cord, round their waist: this rope is as thick as a man's finger; and is tied so tight round their belly, that it would be fatal to a person unaccustomed from infancy to such an unnatural ligature; for it cuts such a deep notch across the navel, that the belly seems in a manner divided, one part being above and the other below the rope. The

men go quite naked, except a piece of cloth, or leaf, Mallicollo. used as a wrapper. Most other nations invent some kind of covering from motives of shame; but here a roll of cloth, continually fastened to the belt, rather displays than conceals, and is the opposite of modesty. Besides having the flat broad nose and projecting cheek-bones of a negro, and a very short forehead, many increased their natural ugliness, by painting their faces and breasts with a black colour. Some few had a small cap on the head made of matted-work. They wear bracelets of white and black shells, which press the upper arm so closely, that they have been put on when the wearer was very young: this tends, as well as the belt, to reduce the Mallicolloe to that slender shape which characterises them. The depression of their foreheads is supposed to be artificial, as the heads of infants may be squeezed into any kind of form.

The first natives that were seen carried clubs in their hands, and waded into the water, carrying green boughs, the universal sign of peace. In a day's time they ventured to come within a few yards of the ship's boat, which was sent out; when they dipped their hands to the sea, and gathering some water in their palms, poured it on their heads. The officers in the boat, in compliance with their example, did the same, with which the Indians appeared to be much pleased. They repeated the word *tomarr*, or *tomarro*, continually; which seemed to be an expression among them equivalent to *tayo* among the Society-Islands. The greater part were now armed with bows and arrows, and a few with spears. At length they ventured near the ship, and received a few presents of Tahitian cloth, which they eagerly accepted, and handed up their arrows in exchange, some of which were pointed with wood, and some with bone, and daubed with a black gummy stuff which was supposed to be poisoned; but its effects were tried on a dog, without producing any dangerous symptoms. They continued about the ship, talking with great vociferation, but at the same time in such a good-humoured manner as was very entertaining. On looking steadfastly at one of them, he began to chatter with great fluency, and "grinned horribly a ghastly smile." Some continued about the ship till midnight; finding, however, at length, that they were but little noticed, for the captain wanted to get rid of them, they returned on shore, where the sound of singing and beating their drums was heard all night. Mr Forster supposes there may be 50,000 inhabitants on this extensive island, which contains more than 600 square miles. "We ought (says he) to figure to ourselves this country as one extensive forest; they have only begun to clear and plant a few insulated spots, which are lost in it like small islands in the Pacific Ocean." Perhaps, if we could ever penetrate through the darkness which involves the history of this nation, we might find that they have arrived in the South-Sea much later than the natives of the Friendly and Society-Islands: so much at least is certain, that the latter appear to be a race totally distinct from the former; their form, their language, and their manners, strongly mark this difference. The natives, on some parts of New-Guinea and Papua, seem to correspond, in many particulars, with what has been observed of the Mallicolloe. They differ likewise very widely from the light-coloured inhabitants of the South-Sea, by keep-  
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ing their bodies entirely free of punctures. Whatever these people saw, they coveted; but they never repined at a refusal. The looking-glasses which were given them were highly esteemed, and they took great pleasure in viewing themselves; so that these ugly people seemed to have more conceit than the beautiful nation at O-Taheitee and the Society Islands. Early the next morning the natives came off to the ship in their canoes, and four or five of them went on board without any arms. They soon became familiar, and, with the greatest ease, climbed up the shrouds to the mast-head; when they came down, the captain took them into his cabin, and gave them medals, ribbons, nails, and pieces of red-baize. They appeared the most intelligent of any nation that had been seen in the South-Sea: they readily understood the meaning conveyed by signs and gestures; and in a few minutes taught the gentlemen of the ship several words in their language, which appeared to be wholly distinct from that general language of which so many dialects are spoken at the Society-Islands, the Marquesas, Friendly-Isles, Easter-Island, and New-Zeeland. Their language was not difficult to pronounce, but contained more consonants than any of them. Mr Forster, and some of the gentlemen from the ship, went on shore, and conversed with the natives, who with great goodwill sat down on the stump of a tree to teach them their language. They were surprised at the readiness of their guests to remember, and seemed to spend some time in pondering how it was possible to preserve the sound by such means as pencils and paper. They were not only assiduous in teaching; but had curiosity enough to learn the language of the strangers, which they pronounced with such accuracy as led their instructors to admire their extensive faculties and quick apprehension. Observing their organs of speech to be so flexible, they tried the most difficult sounds in the European languages, and had recourse to the compound Russian *stsch*, all of which they pronounced at the first hearing, without the least difficulty. They presently learned the English numerals, which they repeated rapidly on their fingers; so that what they wanted in personal beauty was amply compensated to them in acuteness of understanding. They express their admiration by hissing like a goose.

Their music is not remarkable either for harmony or variety, but seemed to be of a more lively turn than that at the Friendly-Islands. Their behaviour to their visitants was, in general, harmless, but cautious: they gave them no invitation to stay among them; for they seemed not to relish the proximity of such powerful people, being probably accustomed to acts of violence and outrage from their neighbours. "In some of their countenances," (says Mr Forster), "we thought we could trace a mischievous, ill-natured disposition; but we might mistake jealousy for hatred."

Very few women were seen, but those few were no less ugly than the men: they were of small stature, and their heads, faces, and shoulders, were painted red. Those who were grown up, and probably married, had short pieces of a kind of cloth, or rather matting, round their waists, reaching nearly to their knees; the rest had only a string round the middle, with a wisp of straw; and the younger ones, from infancy to the age of ten years, went stark naked, like the boys

of the same age. The women were not observed to have any finery in their ears or round their necks and arms, it being fashionable in this island for the men only to adorn themselves; and wherever this custom prevails, the other sex is commonly oppressed, despised, and in a state of servility. Here the women were seen with bundles on their backs, which contained their children; the men seemed to have no kind of regard for them. None of them came off to the ship, and they generally kept at a distance when any party landed from the boat. They perforate the cartilage of the nose between the nostrils; and thrust therein a piece of white stone about an inch and a half long, which is bent like the curvature of a bow. The houses here are, like those of the other isles, rather low, and covered with a palm-thatch. Some were inclosed or walled round with boards, and the entrance to these was by a square hole at one end.

Their weapons are bows and arrows, and a club about two feet and a half in length, made of the casuarina wood, commonly knobbed at one end, and well polished. This weapon they hang on their right shoulder, from a thick rope made of a kind of grass. It appeared to be preserved for close engagements, after having emptied the quiver. On the left wrist they wear a circular wooden plate, neatly covered, and joined with straw, about five inches in diameter, upon which they break the violence of the recoiling bow-string, and preserve their arm unhurt. Their arrows are made of a sort of reed; and are sometimes armed with a long sharp point made of the red wood, and sometimes with a very hard point made of bone: and these points are all covered with a substance which was supposed to be poisoned. Indeed the people themselves confirmed these suppositions, by making signs to the gentlemen of the ship not to touch the point, and giving them to understand that if they were pricked by them they would die: they are very careful of them themselves, and keep them always wrapt up in a quiver. Some of these arrows are armed with two or three points each, with small prickles on the edge to prevent the arrow being drawn out of the wound. Repeated and effectual trials of the virulence of this poison were made upon dogs, but they gave no signs of being hurt by it.

Their food seems to be principally vegetables, since they apply themselves to husbandry. As hogs and fowls are bred here, the natives, doubtless, feed sometimes on pork and poultry; and as they have canoes, it may be supposed that they draw a part of their subsistence from the ocean. The greatest number of canoes that were seen along-side the ship at one time did not exceed 10, or, according to Mr Forster, 14, and no more than four or five people in each: they were small, not exceeding two feet in length, of indifferent workmanship, and without ornament; but provided with an outrigger.

After some slight indications of a hostile intention on the part of the natives, which they had shewn in their canoes whilst about the ship, captain Cook, with a party of marines in two boats, landed in the face of 400 or 500 Indians who were assembled on the shore. Tho' they were all armed with bows and arrows, clubs and spears, they made not the least opposition; on the contrary, seeing the captain advance alone, unarmed, with only a green branch in his hand, one of them,

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**Malmsbury** who seemed to be a chief, giving his bow and arrows to another, met him in the water, bearing also a green branch. When they met, the branches were exchanged; and the chief led the captain by the hand up to the crowd, to whom he immediately distributed presents: in the mean time the marines were landed, and drawn up upon the beach. The captain then made signs that he wanted wood, and they by signs gave him permission to cut down the trees. A small pig was presently brought, and presented to the captain, who in return gave the bearer a piece of cloth. It was expected, from this instance, that an exchange of provisions for various articles of merchandise would take place: but these expectations proved fallacious; no more pigs were procured, and only about half a dozen cocoa-nuts, and a small quantity of fresh water. As these islanders were possessed of hogs as well as fowls, their backwardness to part with either might be owing to the little estimation in which they held such articles as were tendered in barter; for they set no value on any nails, or any other kind of iron-tools, and held all the gew-gaws of fancy equally cheap. They would now and then exchange an arrow for a piece of cloth, but very seldom would part with a bow. After sending on board what wood had been cut, the party all embarked, and the natives dispersed. When the ship was about to leave this island, captain Cook gives the following relation: "When the natives saw us under sail, they came off in canoes, making exchanges with more confidence than before, and giving such extraordinary proofs of their honesty as surprised us. As the ship at first had fresh way thro' the water, several of the canoes dropped astern after they had received goods, and before they had time to deliver theirs in return: instead of taking advantage of this, as our friends at the Society-islands would have done, they used their utmost efforts to get up with us, and deliver what they had already been paid for. One man in particular followed us a considerable time, and did not reach us till it was calm, and the thing was forgotten. As soon as he came along-side, he held up the article, which several on board were ready to buy: but he refused to part with it till he saw the person to whom he had before sold it; and to him he gave it. The person not knowing the man again, offered him something in return, which he refused; and showing him what had been given before, at length made him sensible of the nice sense of honour which had actuated this Indian."

**MALMSBURY**, a town of Wiltshire in England, pleasantly seated on a hill and on the river Avon, which almost surrounds it, and over which it has six bridges. W. Long. 2. 7. N. Lat. 51. 34.

*William of MALMSBURY.* See WILLIAM.

**MALO** (St.), a sea-port town of France, in Bretagne, with a bishop's see. It has a large well frequented harbour, but difficult of access, on account of the rocks that surround it; is a rich, trading place, of great importance, and defended by a strong castle. It was bombarded by the English in 1693; but without success. However, in June 1758, they landed men in Cancalle Bay, who went to the harbour by land, and burnt above 100 ships, great and small; and then retired without loss. It is seated on an island united to the main land by a causeway; is chiefly inhabited by seafaring men, whose time of war fit out a great many

privateers to cruise upon the English. W. Long. 1. 57. N. Lat. 48. 39.

**MALPIGHI** (Marcellus), an eminent Italian physician and anatomist in the 17th century. He studied under Massari and Mariano. The duke of Tuscany invited him to Pisa, to be professor of physic there. In this city he contracted an intimate acquaintance with Borelli, to whom he ascribed all the discoveries he had made. He went back to Bologna, the air of Pisa not agreeing with him. Cardinal Antonio Pignatelli, who had known him while he was legate at Bologna, being chosen pope in 1691, under the name of *Innocent XII.* immediately sent for him to Rome, and appointed him his physician. But this did not hinder him from pursuing his studies, and perfecting his works, which have immortalized his memory. He died in 1694; and his works, with his life written by himself prefixed, were first collected and printed at London in folio in 1697.

**MALPIGHIA**, **BARBADOES CHERRY**; a genus of the triandria order, belonging to the decandria class of plants. There are eight or ten species, all of them shrubby evergreens of the warm parts of America, rising with branchy stems from 8 or 10 to 15 or 20 feet high, ornamented with oval and lanceolate entire leaves, and large pentapetalous flowers, succeeded by red, cherry-shaped, eatable berries; of an acid and palatable flavour; and which, in the West Indies, where they grow naturally, are used instead of cherries. Three of the species are reared in our gardens, and make a fine variety in the stove. They retain their leaves all the year round; and begin to flower about the end of autumn, continuing in constant succession till the spring; after which they frequently produce and ripen their fruit, which commonly equals the size of a small cherry. The flowers are of a pale-red or purple colour. These plants are propagated by seed, which must be sown in spring, in pots of rich earth: then plunge them in a hot-bed; and when the plants are three or four inches high, prick them in separate small pots, give water, and plunge them in the bark-bed of the stove; where, after they have remained a year or two, they may be placed in any part of it. They may even be placed in the open air during a month or two of the hottest weather in summer; but must be carefully supplied with water during the whole year.

**MALPLAQUET**, a village of the Netherlands, in Hainault, famous for a most bloody battle fought here on the 11th of September 1709, between the French under old marshal Villars, and the allies commanded by prince Eugene and the duke of Marlborough. The French army amounted to 120,000 men; and were posted behind the woods of La Marte and Taniers, in the neighbourhood of Malplaquet. They had fortified their situation in such a manner with lines, hedges, and trees laid across, that they seemed to be quite inaccessible. In this situation they expected certain victory; and even the common soldiers were so eager to engage, that they flung away the bread which had been just given them, though they had taken no sustenance for a whole day before. The allied army began the attack early in the morning, being favoured by a thick fog. The chief fury of their impression was made upon the left of the enemy; and with such suc-



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cefs, that, notwithstanding their lines and barricadoes, the French were in lefs than an hour driven from their entrenchments. But on the enemy's right the combat was fustained with much greater oblinacy. The Dutch, who carried on the attack, drove them from their first line; but were repuffed from the fecond with great slaughter. The prince of Orange, who headed that attack, perfifted in his efforts with incredible perseverance and intrepidity, tho' two horfes had been killed under him, and the greater part of his officers flain and difabled. At laft, however, the French were obliged to yield up the field of battle; but not till after having fold a dear-bought victory. Villars being dangerously wounded, they made an excellent retreat under the conduct of Boufflers, and took poft near Griefnoy and Valenciennes. The conquerors took poffeffion of the field of battle, on which above 20,000 of their beft troops lay dead. The los of the French, it is faid, did not exceed 8000; and marfhal Villars confidently afferted, that, if he had not been difabled, he would have gained an undoubted victory.

MALT. See BREWING.

MALT-Tax, is the fum of 750,000*l.* raifed every year by parliament fince 1697, by a duty of 6*d.* on the bufhel of malt, and a proportionable fum on certain liquors, fuch as cyder and perry, which might otherwife prevent the confumption of malt. This is under the management of the commiffioners of the excife; and is indeed itfelf no other than the annual excife. In 1760, an additional perpetual excife of 3*d.* per bufhel was laid upon malt; and in 1763, a proportional excife was laid upon cyder and perry, but new-modelled in 1766. See EXCISE.

MALTA, a celebrated ifland of the Mediterranean, fituated between the 15th and 16th degrees of eaft longitude, and between the 35th and 36th degrees of north latitude. It is about 19 or 20 leagues in length, nine or ten in breadth, and 60 in circumference. Anciently it was called *Melita*; and is fuppofed by Cluverius, from its fituation, and other particulars, to be the Hiperia mentioned by Homer, whence the Phœaces were afterwards driven by the Phœnicians, and retired upon Scheria and the ifland of Corfu; which is the more probable, as the ancient poet places the mountain *Melita* in that ifland. He hath likewife brought fome very probable arguments to prove, that *Melita* or *Malta* is the ancient *Ogygia*; in which the famed nymph *Calypfo*, daughter of the Ocean and *Thetis*, received the fhipwrecked *Ulyffes*, and detained him feven years.

The moft ancient poffeffors of Malta of whom we have any certain account, were the Carthaginians; from whom it was taken by the Romans; and yet during the whole time that it continued under the power of thefe polite nations, it was almoft entirely barren. The foil was partly fandy and partly rocky, having fcarce-ly any depth of earth; and withal fo ftony, that it was hardly capable of producing corn or any other grain except cummin, and fome feeds of a fimilar nature. Its chief products were figs, melons, honey, cotton, and fome few other fruits and commodities which the inhabitants exchanged for corn; and in this barren ftate it feems to have continued till it came into the poffeffion of the Maltefe knights. It laboured alfo under great fcarcity of water and fuel: upon all

which accounts it was till that time but thinly inhabited, there being only about 30 or 40 boroughs or other villages fattered about, and no city except the capital, called alfo *Malta*, and the town and fort of *St Angelo*, which defended the harbour: fo that the whole number of its inhabitants did not exceed 12,000, including women and children; the greateft part of which were very indigent.

According to an ancient tradition, Malta was firft poffeffed by an African prince named *Battus*, an enemy to queen *Dido*; from whom it was taken by the Carthaginians, as may be juftly inferred from feveral Punic infcriptions to be feen on ftone-pillars, and other monuments yet ftanding. From the Carthaginians it paffed to the Romans, who made themfelves mafters of it at the fame time that they fubdued the ifland of Sicily. Thefe were driven out by the Arabs in the year 828; who were driven out of it in their turn by Roger the Norman, earl of Sicily, who took poffeffion of it in 1190: from which time it continued under the dominion of the Sicilian princes till the time of Char. V. when it fell under his power, along with Naples and Sicily. To cover the ifland of Sicily from the Turks, Charles gave the ifland to the knights of *Rhodes*, fince that time called *knights of Malta*.

The origin and hiftory of thefe knights is given under the article *Knights of MALTA and RHODES*. Here it is fufficient to obferve, that in 1530, the knights of *Rhodes* having been expelled from that ifland by Soliman the Turkifh fultan, and delitute of an habitation, accepted, tho' not without fome reluctance on account of its barrennefs, the offer made them by Charles V. of the ifland of Malta. The grand mafter having caufed his two large carracks, the galleys of the order, and a good number of other transport-fhips laden with great quantities of arms, ammunition, and troops, to be got ready, he and his knights embarked in the former, with all the effects, records, and treafure belonging to the order, and the reft in the latter. In their paffage they fuffered very much by a violent ftorm; in which one of their galleys fplit upon a rock, and one of the carracks was run aground by the violence of the waves, after having broke her three anchors. She ftuck fo faft, that they expected every moment to fee her fplit in pieces; when providentially a contrary wind difengaged her without damage. This event was counted as a lucky omen, and on the 26th of October that year, all the company were fafely landed.

At the firft landing of the Maltefe knights, they found themfelves obliged to lodge in a very poor town or borough at the foot of the hill on which ftands the caftle of *St Angelo*, and where their only habitations were fifhermen huts. The grand mafter, with the principal knights, took poffeffion of the caftle, where the accommodations were fomewhat better; tho' thefe too were very mean, and out of repair. Three days after, he took poffeffion of the city, which was formerly called *Malta*, but fince that time hath taken the name of the *Notable City*; and after that, of the whole ifland of Malta, and the neighbouring one of *Gofa*.

The firft care of the knights, after having fettled their authority thro' the two iflands, was to provide fome better accommodation for the prefent, and to choofe a proper place where to fix their habitation.

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But as the island had no other defence than the old castle of St Angelo, and was so much exposed on all sides, that it would have required greater sums than their exhausted treasury could spare, to put it in a proper state of defence; the grand-master was obliged to content himself with surrounding the borough abovementioned, wherein he had ordered new buildings to be reared for the present habitation of his knights, with a stout wall, to prevent its being surprised by the Turkish and Barbary corsairs. His design indeed, at this time, was not to have fixed the abode of the knights in the bare and defenceless island of Malta, but to stay in it only till he had got a sufficient force to attempt the conquest of *Modon*, a town of the Morea, and which was not only a populous and opulent place, but lay very convenient for making an attempt on the island of Rhodes, their ancient habitation, and to which they were naturally attached. This, however, did not hinder his taking all proper measures for securing Malta as well as Gosa, and laying out a proper plan for securing them from attacks, in case the design on *Modon* should fail.

In the mean time, as superstition was then universally prevalent, the grand-master, among other precious relics which he had brought from Rhodes, caused the arm of St Catharine to be carried in procession to the cathedral. Whilst they were on their march, one of the centinels gave them notice, that a large Turkish merchantman was wrecked on their coast. The grand-master immediately dispatched some of his knights and soldiers thither; who finding Isaac the patron of the ship, a native of *Modon*, and one *Maurithalla Nocher*, an excellent engineer, they were retained in the service of the order, and the latter was immediately employed in fortifying the island.

The knights were hardly settled in Malta, when the emperor, and other European potentates, endeavoured to engage them in a war with the inhabitants of Barbary, as the city of Tripoli, then held by Charles, was in great danger of falling into the hands of the infidels. The attempt on *Modon*, however, was first made; but it proved unsuccessful through the base advice of the Maltese forces: for they having been admitted into the city, during the night began to murder and plunder the inhabitants, without waiting for the arrival of the galleys which were coming to their assistance. The consequence was, that the inhabitants armed, and a desperate battle began; in which the Maltese, notwithstanding the utmost efforts, were obliged to retire, but not till they had loaded themselves with plunder, and carried away 800 women captive.

The grand-master, looking upon this disappointment as a sign that Providence had ordained Malta to be the residence of the knights, did not renew his attempts upon *Modon*; but, in 1532, joined with the emperor against the Turks, and sent a great number of his galleys to join the confederate fleet under the celebrated Andrew Doria. In consequence of this aid, the undertaking proved successful; and in all probability the conquest of *Modon* would have been accomplished, had not the soldiery, discouraged by the bad success of the last attempt, openly refused to proceed, and obliged the emperor to proceed to Coron, another town belonging to the Turks. Through the valour of the

Maltese knights, this place was soon obliged to capitulate; and in a second expedition, in 1533, the knights again distinguished themselves in a most eminent manner. They were quickly recalled, however, by the grand-master to the defence of the island, which was now threatened with an invasion by Barbarossa the celebrated Turkish corsair, who scoured those seas at the head of above fourscore galleys. This invasion, however, did not take place; and in 1534, the grand-master Villiers de L'Isle Adam died, and was succeeded by Perino de Ponte, a native of the town of Ast in Italy.

The new grand-master, who received intelligence of his election at St Euphemia in Calabria, very soon after received another express, giving an account of the wars which at that time reigned in Tunis, and the danger that Tripoli as well as Malta was in from Barbarossa, who was by this time become master both of Algiers and Tunis; upon which he made all the haste he could to his new government. His first care was to send a strong reinforcement to Italy; after which, he dispatched an embassy to the emperor, intreating him to equip a powerful fleet against Barbarossa, without which it would be impossible for Tripoli to hold out much longer.

By this embassy from De Ponte, and another to the same purpose from Muley Hassan, the deposed king of Tunis, Charles was easily prevailed on to carry his arms into Africa; in which he was assisted by a great number of the bravest knights, together with 18 brigantines of different sizes, four of the best Maltese galleys, and their vessel called the *great carrack*, of itself almost equivalent to a squadron. In this expedition the knights distinguished themselves in a most eminent manner.

At the siege of Goletta, one of the knights, named *Conversa*, an excellent engineer, by means of a *barcalonga*, got almost close to the great tower, which he furiously battered with large cannon, while the great carrack, which was behind all the rest of the vessels, and by reason of its height could fire over them, did prodigious execution. A breach was soon made; and hardly was it wide enough to be scaled, when the Maltese knights jumped out of the galleys into their long-boats, and thence into the sea, with their swords in their hands, and waded through the water above their girdles, it being too shallow for boats to approach the shore. The standard-bearer of the order was the first that jumped into the water, and led the rest to the attack; they claiming every where the post of honour. They marched with the greatest resolution through the most terrible firing, and showers of all kinds of missile weapons; and, having gained the shore, quickly ascended the breach, on the top of which they planted their great standard. A great number lost their lives, and scarce one came off un wounded; but the emperor did them the justice to own, that the taking the place was chiefly owing to the valour of the Maltese knights.

The city of Tunis was soon taken after the fortress of Goletta; on the surrender of which, the emperor, designing to return into Europe, took his last dinner on board the great carrack; where he was magnificently entertained, and bestowed on the surviving knights the greatest encomiums, and marks of his esteem and gratitude to the owner. These he accom-

3  
They attempt the conquest of *Modon* without success.

4  
Join the emperor against the Turks.

5  
Africa invaded by Charles.

6  
Desperate valour of the Maltese knights.

Malta.  
7  
Privileges  
conferred  
upon them  
by the em-  
peror.

panied with considerable presents and with two new grants. By the first, they were allowed to import corn and other provisions from Sicily, without paying duty; and by the second, the emperor engaged, that none of the order should enjoy any of the estates or revenues, unless they were lawfully authorized by the grand-master and his council; or till the originals had been examined and registered by himself, or such ministers as he should appoint for that purpose. The fleet then set sail for Malta; where, on their arrival, they received the news of the grand-master's death, who was succeeded by Didier de Tolon de St Jalle, a native of Provence, and then grand prior of Tholouse, where he resided at the time of his election.

8  
The Turks  
make an  
unsuccess-  
ful attempt  
on Tripoli.

The present grand-master was a man of great conduct and bravery, which he had formerly shown at the siege of Rhodes; and the situation of affairs at this time required a person of experience. The Turkish corsairs, quite tired out with the dreadful havoc made among them by Botigella, grand prior of Pifa, who seldom quitted the sea, and never failed out without sinking some of them, or making considerable prizes, had agreed to enter into a strong confederacy, either to surprise the city of Tripoli where his retreat was, or, if that failed, to lay siege to it by sea and land; in either of which attempts, they were sure of all the assistance of Barbarossa and Hayradin, then lord of Tagiora. This last had undertaken the command and conduct of the whole enterprise; but the governor being informed of the design, prepared to give him a warm reception. Hayradin came thither with his whole force in the dead of the night, and began to scale the walls in those places where he reckoned them to be most defenceless. They no sooner appeared at the foot of them, than the garrison, which had been kept up in arms, poured down such streams of wildfire, boiling oil, melted lead, &c. and threw such volleys of stones, while the great and small guns so annoyed those that stood farthest off, that great numbers of them were destroyed. They persisted in the attack, however, with great fury and vigour, till Hayradin, who was foremost in one of the escalades, was knocked down by a musket-shot from the top of his ladder. He fell into the ditch, and was taken up almost dead; upon which his troops instantly dispersed themselves, and abandoned the enterprise. The governor of Tripoli, however, judging that this would not be the last visit of the kind which in all probability he would receive, immediately dispatched an express to Malta, with proposals for fortifying the city, and demolishing a strong tower on that coast named *Alcaid*, which was held by a Turkish corsair. His advice being approved of, the commander Botigella, now general of the galleys, was immediately dispatched with a sufficient force; who, having landed his men at Tripoli, immediately marched, with them and a body of Arab mercenaries, towards *Alcaid*; and without staying to open the trenches, or any other covering than his gabions, levelled his artillery against it. Hayradin being informed of this, came with his Turks to its defence; but was intercepted by a strong detachment of Maltese knights at the head of the hired Arabs, and repulsed with loss; so that all he could do was to convey about 50 or 60 Turks into the place, and to annoy the Christians with

some slight skirmishes. Botigella, perceiving that his cannon did not make such quick dispatch as he wished, sent some of his galleys; under the shelter of which he quickly sprung a mine, which brought down part of the wall, and buried most of the corsairs under it; upon which the rest, seeing the Maltese knights mount the breach sword-in-hand, immediately threw down their arms. The tower was then razed to the ground; after which Botigella marched to a town called *Adabur*, whence he drove Hayradin who had intrenched himself in it, and gave the plunder to the Arabs. In his return he attacked and took a large Turkish galley, the cargo of which was valued at 160,000 crowns, and had on board 200 persons; so that he landed in triumph, and was received with the loud acclamations of the whole order, who came to meet him on his arrival. Soon after the grand-master fell sick and died, and was succeeded by John de Homedes.

The Maltese still continued to behave with their usual valour against the Turks; but, through the negligence of Charles V. almost all the places held by the Christians on the African coast were reduced by the infidels, and the valour exerted by the Maltese served only to destroy great numbers of them. At last the emperor's affairs in Africa were totally ruined by his unsuccessful expedition against *ALGIERS*, an account of which was given under that article, n<sup>o</sup> 14-20. Here indeed it is thought that the emperor himself could not have escaped, had not the Maltese knights repulsed the Turks, who had attacked even the imperial quarters. They pursued them even to the gates of the city, and were in hopes of entering it with them; but the governor having caused the gates to be shut before the Turks had all got in, the knights were disappointed. When the Spanish troops re embarked, the Maltese were also of great service in repulsing the enemy; and indeed behaved on both occasions with so much valour and intrepidity, that the rest of the allies could not sufficiently admire them. The misfortune, however, was, that the loss they suffered, both of men and ships, especially by some of their best commanders, more than counterbalanced the glory they had gained. The emperor, before they parted, gave them the most ample testimony of his satisfaction and gratitude, as far as words and encomiums could go; after which, the Maltese commander set sail, with the small remains of his knights, in three shattered vessels, and arrived safely at the port of Malta about the end of November 1548.

While the Maltese were employed in this unfortunate expedition, the island was so terribly annoyed by the Turkish and other corsairs, that the port was in some measure blocked up by them; whilst the coasts, both here and of Gofa, lay exposed to frequent insults and depredations, and often to the loss of their inhabitants. This obliged the Maltese admiral Simeoni to refit his galleys with all possible expedition, and again put to sea in quest of these enemies. In this enterprise he succeeded so well, that he sent home a great number of the corsair captains in chains. Being obliged to put in at the port of Tripoli, the governor informed him, that he had just received an express from the king of Tunis, acquainting him that Barbarossa was making the most pressing complaints to the Porte against the Maltese knights, whilst his lieutenant Morat Haga was making great preparations at Tachora for the

sigee



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siege of Tripoli, which he doubted not would be followed by that of Tunis; the king having become odious to the Turks and Moors, on account of his alliance with the emperor; after whose late disaster a great number of towns in that kingdom had revolted from him, and a much greater number of his subjects had put themselves under the protection of the Algerine monarch, who was expected shortly from Constantinople at the head of a powerful fleet.

On the receipt of these unwelcome news, an embassy was sent to the emperor, in order to persuade him to cause the fortifications of Tripoli be repaired; but without success. All that could be obtained was fair words and promises; the consequence of which was, that the Maltese made most violent and almost incredible exertions against their enemies, till at last Soliman resolved to expell the knights from Malta, as he had before done from Rhodes. To this he was chiefly incited by Dragut, an old experienced corsair, who had obtained the command of his fleet after the death of Barbarossa. The siege was accordingly commenced in 1551; but, by a stratagem, the Turkish commander was induced to depart. However, he reduced the castle of Gosa and the city of Tripoli. Nothing happened of great consequence from that time till the year 1564, when fresh complaints being made to Soliman, he proposed, in a grand council, where most of his officers attended, to extirpate the knights altogether. This design was strenuously opposed by Hali, one of Dragut's most experienced captains, who offered the most solid reasons against it; but being overruled by the rest, an expedition against Malta was resolved upon. One of the sultan's first cares was to send some spies, in the disguise of fishermen, to take a full view of the island, who found means to bring him an exact plan of it, with all its fortifications, havens, strength, and the number of its inhabitants, &c. whilst he was hastening his armaments against it. By this time, as the Maltese had very little reason to doubt that the Turkish armaments were designed against their island, the viceroy of Sicily, Don Garcia, was ordered by his master to take it in his way to the castle of Goletta, in order to consult with the grand-master about the necessary means for opposing such a formidable power. The grand-master acquainted him, that, in case of an attack upon Malta, he should want both men and corn: upon which the viceroy engaged to supply him with both, on his return to Sicily; in pledge of which he left one of his sons with him, who was afterwards admitted into the order. He was no sooner departed, than the grand-master summoned all the knights of the order, dispersed through several parts of Europe, to repair to him. Those that were in Italy raised a body of 2000 foot, to which the viceroy of Sicily added two companies of Spanish forces. All the galleys of the order were employed in transporting these troops, together with all manner of provisions and ammunition, into the island; and the knights that were in it, in distributing, disciplining, and exercising their new levies, as well as the Maltese militia, against the siege. Thus the grand-master saw himself strengthened by the arrival of 600 knights, all of whom brought with them retinues of stout good servants, fit to assist in the defence of the island; whilst those, who by reason of age, sickness, or other impediments, could

not repair to him, sold their most valuable effects in order to assist him with their purses. The pope, on his part, contented himself with sending a supply of 10,000 crowns; and the king of Spain ordered his viceroy Don Garcia to raise an army of 20,000 men, to be ready to sail thither as soon as called for. The grand-master employed the remainder of his time in visiting all the forts, magazines, arsenals, &c. and assigning to each tongue their several posts, and making all necessary preparations, till the Ottoman fleet appeared in sight on the 18th of May 1565. It consisted of 159 large galleys and galleons, carrying on board 30,000 forces, janizaries and spahis, besides the slaves at the oar, accompanied by a considerable number of other vessels, laden with artillery, ammunition, and other necessaries for a siege. The whole armament was commanded by Mustapha Basha, an old experienced officer, aged about 85 years, and an old favourite and confidant of the sultan; of an haughty cruel temper, who made it a merit to violate his word, and to use all manner of violence against the Christians, especially against the Maltese. This formidable army landed at some distance from Il Borgo, and soon afterwards spread themselves over the country; setting fire to the villages, putting the peasants to the sword, and carrying off such of the cattle as, notwithstanding the orders of the grand-master, had not been secured within the forts and towns.

While the Turks were thus employed, La Valette (the grand-master) sent out De Copier, marshal of the order, with 200 horse and 600 foot, to watch their motions. De Copier, an officer of great experience, executed his commission with so much prudence and vigour, that, by falling unexpectedly on detached parties, he cut off 1500 Turks, with the loss only of 80 men.

The Turkish general held a council of war as soon as all his troops were landed, to assist him in resolving where he should begin his attack. Piali, the Turkish admiral, agreeably to what he understood to have been the sultan's instructions, was of opinion that they ought not to enter upon action till Dragut should arrive. But Mustapha having received information of the king of Spain's preparations, thought something ought to be done instantly for the safety of the fleet; which lay at present in a creek, where it was exposed to the violence of the east wind, and might be attacked with great advantage by the Spaniards. On this account he was of opinion, that they should immediately lay siege to a fort called *St Elmo*, which stood on a neck of land near Il Borgo, having the principal harbour on one side of it, and on the other another harbour large enough to contain the whole fleet in safety. This proposal was approved by a majority of the council, and Mustapha proceeded without delay to carry it into execution.

La Valette did not expect that a place which was neither strong nor large enough to admit a numerous defence of garrison, could be defended long against so great a force as was employed to reduce it; but he thought it necessary that the siege of this fort should be prolonged as much as possible, in order to give the viceroy of Sicily time to come to his relief. With this view, he resolved to throw himself into *St Elmo* with a select body of troops; and he was preparing to set out, when the whole body of knights remonstrated with such

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17  
The siege commenced.

10  
The Turks take Tripoli, and resolve to expell the knights from Malta.

12  
Desperate defence of fort St Elmo.

such earnest importunity against his leaving the town, that he at last consented to suffer the reinforcement, which he had prepared, to be conducted to the fort by a knight called *De Medran*, upon whose conduct and intrepidity he could rely with the most assured confidence.

Not long after *De Medran's* arrival in the fort, the garrison made a vigorous sally, in which they drove the enemy from their entrenchments, and put a number of them to the sword. But the rest soon recovered from their surprise; and having returned to the charge, they compelled the Christians to retire. In this encounter, the vigorous efforts of the Janissaries were favoured by the wind, which blew the smoke of the guns upon the fort, and covered the besieged with a thick cloud, through which it was impossible to discern the operations of the enemy. This incident the Turks had the presence of mind to improve to very great advantage. They seized, unperceived, upon the counterescarp; made a lodgement there with beams, woollacks, and gabions; and raised a battery upon it with incredible expedition. After the smoke was dispersed, the besieged beheld what had been done with much astonishment; and they were the more disquieted, as the fortification which the Turks had raised upon the counterescarp overtopped a ravelin which lay near it, in which the besieged could no longer appear with safety. They resolved, however, to defend this ravelin as long as possible, whatever it should cost them.

In the mean time *Dragut*, and another noted Corsair named *Uluchiali*, arrived with 20 galleys; having, besides slaves and seamen, 2500 troops on board. This reinforcement, and the presence of *Draguet*, added fresh vigour to the operations of the siege. This gallant Corsair exposed himself, on all occasions, with the utmost intrepidity; spent whole days in the trenches; and as, besides his other extraordinary talents, he was particularly skilful in the management of artillery, he caused some new batteries to be raised in more advantageous situations than had hitherto been made choice of; and kept up a continual fire both on the ravelin above-mentioned and a cavalier that covered the fort, and was one of its principal defences.

This cavalier soon became the only defence which could prevent the besiegers from coming up to the very foot of the wall. Some Turkish engineers having approached the ravelin at day-break, to observe the effects of their artillery, they perceived a gun-port so low, that one of them, when mounted on the shoulders of another, looked into it, and saw the Christian soldiers lying on the ground asleep. Of this they gave immediate information to the troops; who, advancing as quickly and silently as possible, and clapping ladders to the gun-hole, got up into the ravelin, and cut most of the Christians to pieces.

Between this ravelin and the cavalier lay the ditch, over which the besieged had thrown a temporary bridge of planks, leading up to the cavalier. The Turks, perceiving this, leaped instantly upon the bridge, and attempted to make themselves masters of the cavalier, as they already were of the ravelin. But the garrison was now alarmed; the bravest of the knights hastened from different quarters to the post of danger; and, after an obstinate engagement, they com-

pelled the Turks to retire into the ravelin. There, observing another way of reaching the cavalier by a path from the bottom of the ditch, they threw themselves down without dread or hesitation; and having ascended by this path to the other side, they renewed their attack with greater fury than ever. The combat lasted from sun-rise till noon, when the knights at last proved victorious. About 20 knights and 100 soldiers were killed; and near 3000 of the enemy.

As the ravelin was open on the side towards the fort, the besieged pointed some cannon against it, and made great havoc among the infidels. But *Multapha*, sensible of the value of the acquisition he had made, poured in fresh soldiers without number, and the pioneers coming forward with woollacks, planks, and gabions, put the troops at length in safety, and made a lodgement in the ravelin, of which the garrison were never afterwards able to dispossess them.

The grand-master's concern on account of this disaster was greatly augmented, by considering, that it could not have happened so soon without some negligence on the part of the garrison. He sent them, however, an immediate reinforcement; and both the siege and the defence were carried on with the same vigour as before.

But the situation of the besieged was now become much more dangerous than formerly. The Turks applied with unremitting diligence to heighten the ravelin till it overtopped the wall of the fort; and after this the garrison could no longer appear upon the parapet with safety. Many were killed by the enemy's artillery, several breaches were made in the wall, and the hearts of the bravest knights began to fail within them.

They agreed therefore, though with much reluctance, to apply to the grand master for liberty to quit the fort; and they made choice of the chevalier *de Medran* for their messenger. He represented, that the fort was in reality no longer tenible; and that, to continue in it, though only for a few days, would infallibly occasion the destruction of the garrison. <sup>13</sup> The knights desire permission to leave the fort, but are refused.

Most of the knights in council thought that this request of the garrison ought to be immediately granted. But *la Valette* was of a contrary opinion.—This he represented to the chevalier *de Medran*; and sent him back with instructions to remind the knights of the vows which they took, at their entrance into the order, of sacrificing their lives for its defence. He likewise bad him assure them, in his name, that he would not fail to send them such reinforcements as they should stand in need of; and was determined, as soon as it should be necessary, to come himself to their assistance, with a fixed unalterable purpose to lay down his life, sooner than deliver the fort into the hands of the infidels.

This answer had the desired effect on several of the knights, and particularly on those whose principles of honour and attachment to the order were confirmed by years. But the greater part of them were much dissatisfied. They thought the grand-master's treatment of them harsh and cruel; and wrote him a letter, subscribed by 53, in which, after repeating their former request, they informed him, that if he did not, on the next night, send boats to carry them to the town,

town, they were determined to fall out into the Turkish camp, where they might fall honourably by the sword, instead of suffering such an ignominious death as they had reason to expect if the fort was taken by storm.

To this letter la Valette replied, "That they were much mistaken if they expected to satisfy their honour by throwing away their lives; since it was no less their duty to submit to his authority, than to sacrifice their lives in defence of the order: that the preservation of the whole depended on their present obedience to his commands: that no aid was to be expected from Spain, if the fort were given up. And that if he should yield to their request, and bring them to the town, the town itself would then be immediately invested; and they, as well as the rest, soon afterwards reduced to a situation more desperate than that from which they were so solicitous to escape, by deserting an important post which they had undertaken to defend." Besides this letter, he sent three commissioners to examine the state of the fortifications; intending by this measure, either to gain time, or to prevent the garrison from sinking into despair.

These commissioners differed very widely in the accounts which they delivered at their return. Two of them thought it impossible to defend the fort much longer. But the third, named Constantine Calotriot, a Greek prince, descended from the famous Albanian hero Scanderbeg, whether from ignorance, or a consciousness of greater resources in his native courage than the other two possessed, maintained that the garrison was far from being reduced to the last extremity; and to give proof how firmly he was persuaded of the truth of what he said, he offered to enter the fort himself, and to undertake the defence of it with such troops as should be willing to accompany him.

The grand-master, strongly impressed with a sense of the necessity of protracting the siege, immediately accepted this offer, and bestowed the highest encomiums on Calotriot's zeal and resolution. Nor did Calotriot find any difficulty in persuading a sufficient number to attend him, who were no less zealous and resolute than himself. The soldiers crowded to his standard, and were emulous to have their names enrolled for that dangerous service in which he had engaged.

When la Valette saw the spirit by which these men were animated, and had no longer any doubt of being able, by their means, to prolong the siege of the fort; he sent a letter to the knights, acquainting them, that he was now willing to give them their discharge; and would immediately send another garrison, into whose hands, he desired, they should be ready to deliver up the fort, and come themselves to the town in the boats in which their successors were to be transported.

The contents and style of this letter affected the knights in the most sensible manner, and roused within them that delicate sense of honour by which the order had been so long and so eminently distinguished. — They resolved without hesitation to remain in the fort till every man should perish, rather than either deliver it to the new garrison, or abandon it to the enemy. And they went in a body to the governor, and intreated him to inform the grand-master of their

repentance, and to join with them in praying that they might be suffered to wipe out the remembrance of their fault by their future conduct.

The grand-master suffered himself at last to be overcome; and henceforth the garrison, dismissing all thoughts of their own safety, were intent on nothing but how to prolong the defence.

The grand-master sent them every night fresh troops, to supply the place of the killed and wounded; and kept them well furnished with provisions, ammunition, and fire-works. Of these last he had invented a particular kind, which consisted of hoops of wood, covered with wool, and steeped in boiling oil and other inflammable liquors, mixed with nitre and gunpowder. To these machines they set fire, and threw them flaming in the midst of the enemy when they were crowded together at an assault. It happened often, that two or three of the Turks were hooked together and scorched to death; and the utmost confusion was produced wherever they were thrown.

The besieged stood much in need of this, and every other instrument of mischief that could be devised, for their defence. In spite of the most vigorous opposition, the Turks had cast a bridge over the ditch, and begun to sap and undermine the wall. From the 17th of June to the 14th of July, not a single day passed without some encounter; and Mustapha had frequently attempted to scale the wall of the fort, but had been as often repulsed with the loss of some of the bravest of his troops.

Alarmed at having been detained so long before a place of such inconsiderable strength, he resolved to make one great decisive effort; and to bring to the assault as many of his forces as the situation of the place would permit him to employ. He had already made several breaches; but in order to secure the success of the assault which he now intended, he kept his batteries playing all the 15th without intermission, till the wall on that side where he designed his attack was almost level with the rock. On the 16th, the fleet was drawn up, before sun-rise, as near the fort as the depth of the water would allow. Four thousand musketeers and archers were stationed in the trenches; and the rest of the troops, upon a signal given, advanced to the breach. The garrison was prepared to receive them; the breach was lined with several ranks of soldiers, having the knights interspersed among them at certain distances. The Turks attempted often to break through this determined band, and to overpower them with their numbers; but their numbers served only to augment the loss which they sustained. Every shot from the fort did execution. The artillery made dreadful havoc among them; and the burning hoops were employed with astonishing success. The novelty of these machines, and the shrieks of those who were caught in them, added greatly to the terror which they inspired; and made it impossible for the Turkish officers to keep their men firm and steady in pursuing the advantages which, had they preserved their ranks, their numbers must have infallibly acquired.

At length Mustapha, after having continued the assault for more than six hours, without gaining a single inch of ground on the besieged, gave orders for sounding a retreat. In this attack the garrison lost



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about 20 knights, and 300 soldiers; but this loss was immediately supplied by a reinforcement from the town: and Mustapha was at last convinced, that, unless the communication between the fort and the town were cut off, it would be impossible to bring the siege of the former to a period, while any troops remained in the other parts of the island. By the advice of Dragut, he resolved to extend his trenches and batteries on the side next the town, till they should reach to that part of the sea, or great harbour, where those supplies were landed which the grand-master daily sent to the garrison. This undertaking he knew must be attended with the utmost difficulty, because all the space between his intrenchments, and the point to which it was necessary to extend them, lay exposed to the artillery both of fort St Elmo and St Angelo. In viewing the ground, a Sangiac, in whom he put confidence, was killed by his side; and, which was still a more irreparable loss, Dragut received a mortal wound, of which he died in a few days. This did not, however, discourage Mustapha from pursuing his design. By employing his troops and pioneers at the work day and night, without intermission, he at length carried it into execution. Then having planted batteries along the shore, and filled his trenches with musketeers, it was impossible for any boat to pass from the town to the fort, without the most imminent danger of either being sunk or intercepted.

After this precaution, he resumed with fresh vigour his attempts to take the fort by storm. On the 21<sup>st</sup>, he made four different assaults: all of which the garrison withstood; and, in repulsing so many thousand brave and well-disciplined troops, displayed a degree of prowess and fortitude which almost exceeds belief, and is beyond the power of description. But this heroic garrison was now exceedingly reduced in number; and there was the strongest reason to apprehend, that, in one assault more, they must inevitably be overpowered, unless a reinforcement were sent them from the town. Of their desperate situation they gave intelligence to the grand-master, by one who swam across the harbour in the night. The boats were instantly filled with knights and other soldiers, who generously resolved to devote themselves to certain destruction for the general safety, and the preservation of the fort. They set off from the town with as much alacrity as if they had entertained the most sanguine hopes of victory; but they found the Turks everywhere so much upon their guard, and the lines so strongly defended, that, after several fruitless attempts to land, they were at last obliged to return, depressed with sorrow for the fate of their brave companions.

The garrison, now despairing of relief, gave themselves up for lost; but instead of either capitulating or attempting to escape, they prepared for death, and passed the night in prayer and in receiving the sacrament; after which they embraced one another tenderly, and then repaired to their respective posts; while such of the wounded as had been disabled from walking, were, at their own earnest desire, carried to the side of the breach, where they waited, without dismay, for the approach of the Turkish army.

Early in the morning of the 23<sup>d</sup> of July, the

Turks advanced to the assault with loud shouts, as to certain victory, which they believed so small a handful of men as now remained in the fort would not dare to dispute with them. In this expectation they were disappointed. The garrison being resolved on death, and despising danger, were more than men; and exerted a degree of prowess and valour that filled their enemies with amazement. The combat lasted upwards of four hours, till not only every knight, but every soldier had fallen, except two or three who saved themselves by swimming. The Turkish colours were then planted on the ramparts; and the fleet entered the harbour, which the fort commanded, in a kind of triumph. When Mustapha took a view of the fort, and examined its size and fortifications, he could not refrain from saying, "What will not the father cost us, (meaning the town,) when the son, who is so small, has cost so many thousands of our bravest troops?" But this reflection, far from exciting his admiration of that heroic fortitude which he had found so difficult to overcome, served only to inspire him with a brutal fury. He ordered all such of the garrison as were found lying on the breach alive to be ript open, and their hearts torn out: and, as an insult on the knights and their religion, he caused their dead bodies to be searched for, and large gashes to be made in them, in the form of a cross; after which he tied them on planks, and threw them into the sea, to be carried by the wind and tide to the town or fort St Angelo.

The grand-master was at first melted into tears at this shocking spectacle; but his grief was soon converted into indignation and revenge: and these passions betrayed him into an action unworthy of the exalted character which he bore. In order to teach the basia, as he pretended, to make war with less barbarity, he caused all the Turks whom he had taken prisoners to be massacred; and then putting their heads into his largest cannon, he shot them into the Turkish camp.

In the siege which has been related, the order lost about 1500 men, including 130 of the bravest knights.

Mustapha vainly imagined, that, being intimidated by the fate of their companions, they would be now inclined to listen to terms of capitulation: and in this hope, he sent an officer with a white flag to one of the gates, attended by a Christian slave designed to serve for his interpreter. The Turk was not allowed to enter within the town; but the Christian was admitted, and was led through several ranks of soldiers under arms by an officer, who, after shewing him all the fortifications of the place, desired him to take particular notice of the depth and breadth of the ditch, and said to him, "See there, the only spot we can afford your general; and there we hope soon to bury him and all his Janizaries."

This insulting speech being reported by the slave, excited in the fiery mind of the basia the highest degree of wrath and indignation, and made him resolve to exert himself to the utmost in the prosecution of the siege. His troops, though greatly diminished, were still sufficient to invest at once both the town and the fort of St Michael. He kept a constant fire on both; but he intended first to apply to the reduction

Malta.

<sup>15</sup> The fort taken, and the garrison cut off.

<sup>16</sup> Cruelty of Mustapha.

<sup>17</sup> And of the grand-master.

Maha.

tion of the latter, which he proposed to attack both by land and water, at the extremity of the peninsula on which it stands. In order to accomplish this design, it was necessary he should have some shipping introduced into the harbour for transporting his forces. But the mouth of the harbour having been rendered inaccessible by a great iron chain and the cannon of St Angelo, his design must have been relinquished, if Piali had not suggested an expedient against which the grand-master had not provided. This was, to make the Christian slaves and the crews of the ships draw a number of boats, by the strength of their arms, over the neck of land on which stood fort St Elmo. Of this proposal, which Mustapha immediately adopted, information was carried to the grand-master by a Turkish officer; who, being by birth a Greek, was touched suddenly with remorse, and deserted to the Christians. In consequence of this intelligence, La Valette set a great number of hands to work in framing a flacado along that part of the promontory where the Turks intended their attack; and at another part, where the depth of the water, or the hardness of the bottom, would not admit the flacado, he caused strong intrenchments to be made upon the beach. Mustapha, in the mean time, fired incessantly upon the fort, while the slaves and crews were employed in transporting the boats over land into the harbour. At length the basha, judging that the number of boats which he had transported would be sufficient, and that the breaches which his artillery had made were practicable, resolved, without further delay, to make an attack both by sea and land. He was the more confident of success, as, since the taking of St Elmo, he had received a considerable reinforcement, by the arrival of Hascem, son of Barbarossa, with 2500 select soldiers, commonly called the *Braves of Algiers*. Hascem, who possessed a considerable share of his father's fire, and was ambitious to distinguish himself in the sultan's service, begged of Mustapha to intrust him with the assault of fort St Michael; and vaunted, with his natural arrogance, that he would soon make himself master of it sword-in-hand. The basha, whether from an opinion of his valour, or an intention to make him learn at his own expence the folly of his presumption, readily complied with his request; and, having added 6000 men to his Algerines, he promised to support him with the rest of his army.

Hascem divided his forces with Candelissa, an old corsair, his lieutenant; to whom he committed the attack by sea, whilst he reserved that on the land-side to himself.

Candelissa having put his troops on board the boats, set out with drums beating, and hautboys and other musical instruments playing, preceded by a boat filled with Mahometan priests, some of whom were employed in offering prayers to heaven for his success, or in singing hymns; while others had books in their hands, out of which they read imprecations against the Christians. Candelissa attempted first to break down the flacado which had been formed to obstruct his landing; but finding it much stronger than he expected, and that, while he was employed in demolishing it, his troops must suffer greatly from the enemy's fire, he thought it would be easier to make a descent

on that part of the shore which the grand-master had strengthened with entrenchments. At this important post, the Christian troops were commanded by an ancient knight of the name of *Guimeran*. This experienced officer reserved his fire till the Turks had advanced within a little distance of the shore, when, by a single discharge, he killed about 400 men. This did not prevent the rest from approaching. Candelissa pushed forwards while the Christians were loading their cannon, and landed at the head of his Algerines. But Guimeran having reserved some cannon charged with grape-shot, did dreadful execution among them after they had landed, and many of them began to fly to their boats; which Candelissa observing, he commanded the boats to be put off to a little distance from the shore. His troops, perceiving then that they must either die or conquer, took courage from despair, and advanced boldly to the intrenchment, with ladders for scaling it in one hand, and their sabres in the other. The combatants on both sides displayed the most intrepid valour. Great numbers fell, and the ditch was choaked with blood, and with the bodies of the dead and wounded. The Turks at last, after an engagement of five hours, reached the top of the entrenchment, and there planted their ensigns. The knights, stung with shame on account of their retreat, returned with redoubled ardour. But they would probably have been overpowered by the superior number of the enemy, had not the grand-master sent them a seasonable reinforcement, under the admiral de Giou and the chevalier de Quiney; who fell upon the Algerines and Turks with a degree of fury that struck terror into Candelissa himself, who was noted for his intrepidity. Having ordered the boats to be brought nearer the shore, he was among the first who fled. His bravoes fought desperately for some time after he had left them; but were at length thrown down from the intrenchments, and compelled to fly to their boats with the utmost precipitation. The Christians pursued them, and the batteries continued firing on them without intermission. Many of the boats were sunk; the water was covered with dead bodies, mangled limbs, shields and helmets. Of the 4000 who had been sent on this enterprize, scarcely 500 remained, and many of these were dangerously wounded.

Hascem was not more fortunate in his assault by land, than Candelissa was by sea. After having been repulsed at one breach with great slaughter, he rallied his troops, and led them on to another, where he fought long and desperately, till, most of the bravoes having fallen by his side, he was obliged, with much reluctance and sorrow, to found a retreat.

Mustapha, not unmindful of his promise to support him, no sooner perceived him beginning to retire, than he ordered the Janisaries, whom he kept under arms, to advance. The garrison had maintained an engagement with Hascem for five hours, in the middle of the day, and in the hottest season of the year; yet, as if they had not been subject to the wants and weaknesses of humanity, they advanced beyond the breach to meet the Janisaries, and fought apparently with as much vigour and fortitude as before. By the power of superior numbers, they were compelled to fall back within the breach. But there they made the most desperate resistance; and, being reinforced by De Giou

Maha.

18  
The Turks  
repulsed  
with great  
slaughter.

19  
the Mal-  
tese.

Malta.

and De Quiney, with the troops which had triumphed over Candelissa, they at last repulsed the Janisaries with dreadful slaughter; after having lost more than 40 knights, and 200 of the bravest of the common men.

Mullapha, enraged by this invincible obduracy which the Christians displayed in their defence, and dreading that the Spanish succours, which had been already delayed much longer than he expected, might soon arrive, resolved now to employ his whole force at once; and, while he himself prosecuted the siege of fort St Michael with one half of his troops, to employ the other, under Piali, against the town. More batteries were raised. The trenches were advanced still nearer than before. Bridges of sail-yards and masts were thrown over the ditches. Mines, notwithstanding the hard and rocky soil, were sprung. Assaults were repeated without number; and the two bahas, emulous of one another, and each of them agitated with continual anxiety lest victory should declare first for his competitor, exhibited the most shining proofs of personal courage, and exhausted all the art of war then known in the world. Yet, thro' the determined bravery of the knights, conducted by the grand master with consummate prudence and indefatigable vigilance, the Turks were baffled in every attempt, and repulsed with slaughter. Mullapha flattered himself once with the most sanguine hopes of success on his part, from a machine invented by his principal engineer, in the form of a huge cask bound strongly with iron hoops, and filled with gun powder, nails, chains, bullets, and such other instruments of death. After setting fire to a train which was fastened to this machine, it was thrown, by the force of an engine, upon a ravelin that was the principal defence of the fort. But the garrison, undismayed, found means, before it caught fire, to cast it out again into the midst of the assailants. In a moment afterwards it burst with dreadful fury, and filled the Turks with consternation. The knights then sallied out upon them sword-in-hand, and, taking advantage of their confusion, killed many of them, and put the rest to flight.

Piali had, on some occasions, still more reason than Mullapha to entertain the hopes of victory, altho' the town was much stronger than the fort, and La Valette commanded there in person. By his batteries he had demolished all the out-works of the place, and had made an immense breach in the wall. While his troops were engaged in a furious assault, that engrossed the whole attention of the besieged from morning till night, he employed a great number of pioneers in raising a cavalier or platform of earth and stones, close by the breach, and so high as to overlook the parapet. Night, in the mean time, came on, and prevented him from carrying any further this great advantage; but he doubted not that next day he should be able to make himself master of the place.

As soon as he had drawn off his forces, a council of the order was convened, and most of the knights were of opinion that the town was no longer tenible; that the fortifications which still remained should be blown up; and that the garrison and inhabitants should retire into the castle of St Angelo. But the grand-master received this proposal with horror and indignation. "This would be in effect," said he, "to deliver the

whole island into the hands of the infidels. Fort St Michael, which has been so gallantly defended, and which is preserved by its communication with the town, would thus be soon reduced to the necessity of surrendering. There is no room in the castle of St Angelo for the inhabitants and troops; nor, if there were room, is there water in that fort for so great a number." It was then proposed, that at least the relics of the saints and the ornaments of the churches should be carried into the castle; and the knights earnestly treated the grand master to retire into it himself, assuring him that they would conduct the defence with the utmost vigour and vigilance. "No, my brethren," he replied, "what you propose as to the sacred things would serve only to intimidate the soldiers. We must conceal our apprehensions. It is here we must either die or conquer. And is it possible that I, at the age of 71, can end my life so honourably as in fighting, together with my friends and brethren, against the implacable enemies of our holy faith?" He then told them what he thought proper to be done, and proceeded instantly to put it into execution. Having called all the soldiers from fort St Angelo, except a few who were necessary for managing the artillery, he employed them and the inhabitants all night, in throwing up intrenchments within the breach; after which he sent out some of the bravest knights, with a select body of troops, to make an attempt on the cavalier. These men stole softly along the foot of the wall till they arrived at the place appointed; when they set up a loud shout, and attacked the guards whom Piali had left there with so much fury, that the Turks, believing the whole garrison had fallen upon them, abandoned their post, and fled precipitately to their camp.

The cavalier was immediately fortified, a battery of cannon planted on it, and a parapet raised on the side towards the enemy. And thus the breach was rendered impracticable; the town put in greater security than before; and a work, which had been devised for its destruction, converted into a bulwark for its defence.

The grand master had now greater confidence than ever of being able to hold out till the Spaniards should come to his relief. In consequence of the assurances given by Philip and the Sicilian viceroy, he had, long before this time, entertained the hopes of their arrival; and had often earnestly solicited the viceroy to hasten his departure from Messina. The conduct of this nobleman was long exceedingly mysterious. The patience of the knights was worn out by his delays; and they, and many others, suspected that the real motive of his conduct was the dread of encountering with an admiral of so considerable reputation as Piali. But it afterwards appeared that the viceroy had acted agreeably to his instructions from the court of Spain. For altho' Philip was, for the reasons abovementioned, sincerely interested in the preservation of the knights, and had amused them with the most flattering promises of assistance; yet he seems from the first to have resolved not to expose himself to danger on that account, and to avoid, if possible, a general engagement.

A generous and grateful prince would have acted very differently towards an ally so deserving of his support; and if either generosity or gratitude had guided of been the leading principle of Philip's conduct, it is Spain.

pro-

20  
A great number of Turks destroyed by a contrivance of their own.

21  
The grand-master prevents the knights from abandoning the town.

22  
Ungrateful and ungenerous conduct of his majesty.



probable he would, on this occasion, have regarded the knights as his own subjects; and have thought it no less incumbent on him to exert himself in their defence, than if they had acknowledged him as their sovereign.

But Philip was affected by their danger only so far as it threatened the tranquillity of his own dominions. He had resolved to interpose in their behalf, rather than to suffer them to be overpowered; but he appears to have been very little touched with their calamities, and to have intended to leave them to themselves, as long as there was any prospect of their being able to make resistance; by doing which he considered, that he would not only preserve his own strength entire, but might afterwards engage with the Turks when they were exhausted by the operations of the siege.

Philip adhered inflexibly to this plan, notwithstanding the grand master's repeated importunities, much longer than was consistent with his own selfish views. For, without a degree of fortitude and prowess on the part of the garrison, and a degree of wisdom, vigilance, and magnanimity on that of the grand-master, infinitely higher than there could be reason to expect, it must have been impossible for such a handful of men to have withstood, for so long a time, so great a force, and such mighty efforts, as were employed to reduce them. Even the death of the grand-master alone, whose person was exposed to perpetual danger, would have proved fatal to the knights, long before Philip sent orders to his viceroy to give them any effectual support; and in this case, as his own dominions or his fleet would have been immediately attacked, he would probably have had little reason to be satisfied with the timid, ungenerous counsels which he pursued.

Whatever judgment may be formed on this head, the viceroy did not think himself at liberty to yield to the repeated applications of the grand-master, till the operations of the siege began to relax, and the Turkish forces were reduced from 45,000 to 15,000 or 16,000; of whom many were worn out with the fatigues which they had undergone, and others rendered unfit for action by a bloody flux, which for several weeks had raged amongst them.

In this situation of affairs, when it was probable that the knights would, without assistance, have compelled the Turks to raise the siege, the viceroy let the grand-master know, that he had now received such instructions from the king, as put it in his power to shew his attachment to the order: that he was not indeed permitted to attack the Turkish fleet; but that he would immediately bring him a strong body of troops, whose commanders (as he himself must return to Sicily) were to be entirely subject to the grand-master's authority till the enemy should be expelled.

The viceroy, altho' still suspected of interposing unnecessary delays, at length fulfilled his promise; and on the 7th of September landed 6000 men, under Don Alvaro de Saude and Alcanio della Corua, in that part of the island which lay at the greatest distance from the Turks; after which, he immediately carried back the fleet to Sicily.

In the mean time, intelligence being brought to Mustapha that the Spaniards were landed, and marching towards him, he was thrown into the most dreadful consternation. Sensible that his soldiers were much

diseheartened by their ill success, he imagined that he was about to be attacked by a superior army, consisting of the bravest and best disciplined troops in Spain. Without waiting for information of their number, he forthwith raised the siege, drew his garrison out of St Elmo, and, leaving all his heavy cannon behind him, embarked his troops with as much precipitation as if the Spaniards with superior forces had been in sight. He had scarcely got on board when a deserter arrived from the Spanish camp, and informed him, that with 15,000 or 16,000 men, he had fled before an army that did not exceed 6000, having no general at their head, and commanded by officers who were independent of one another. The basha was overwhelmed with shame and vexation by this intelligence, and would have immediately disembarked; but this, he knew, he durst not attempt without consulting Piali, Halsem, and his other principal officers.

While he was deliberating upon it, the grand-master improved to the best advantage the leisure that was afforded him. He employed all the inhabitants, men, women, and children, as well as the soldiers, in filling up the enemy's trenches, and demolishing their works; and put a garrison without delay into fort St Elmo; in which the Turks now beheld from their ships the standard of St John erected, where that of Mahomet had lately stood.

This demonstrated to Mustapha how much new labour awaited him in case he should return to the siege; but being enraged against himself on account of the precipitancy of his retreat, and disquieted at the thoughts of the reception which he had reason to expect from Solyman, he wished to atone for his imprudence, and to wipe off the reproach in which it had involved him, by victory or death. Piali, who, from his jealousy of the basha's credit with the sultan, was not sorry for the failure of his enterprise, represented in a council of war convened on this occasion, That as the troops were much dispirited and worn out, it would be exposing them to certain destruction, either to lead them against the enemy, or to resume the operations of the siege. But a majority of the council were of a different opinion; and it was resolved to land the forces again without delay.

The Turkish soldiers complained bitterly of this unexpected resolution, and obeyed the orders to disembark with the greatest reluctance. Their officers were obliged to employ threats with some, and force with others. At length the number intended was put on shore, and Mustapha set out at their head in search of the enemy.

The grand-master had not neglected to give early notice of their march to the Spanish commanders, who had intrenched their little army on a steep hill, which the Turks would have found almost inaccessible; and it was the opinion of some of the principal officers, that they should avail themselves of the advantage of their situation, and stand on their defence. But this proposal was rejected with disdain by the bold adventurous De Saude, and the greatest part of the Spanish officers; and the troops were led out of their encampment, to meet the enemy in the open field. This conduct, more fortunate perhaps than prudent, contributed to increase the dejection of the Turkish soldiers, and to facilitate their defeat. Having been

23  
The Turks  
raise the  
siege in a  
panic.

23  
They re-  
turn, but  
are defeat-  
ed.

dragged against their inclination to the field of battle, and being attacked by the Spaniards with great fury, both in front and flank, they scarcely fought, but, being struck with a sudden panic, fled with the utmost precipitation.

Muſtaſſa, confounded and enraged by this pusillanimous behaviour of his troops, was hurried along by the violent tide of the fugitives. He fell twice from his horse, and would have been taken prisoner if his officers had not rescued him. The Spaniards pursued briskly till they came to the sea shore. There Piali had his boats ready to receive the Turks, and a number of shallops filled with musketeers drawn up to favour their escape. Without this precaution, they must all have perished; and, even notwithstanding the protection which it afforded them, the number of their killed amounted to 2000 men, while the victors lost only 13 or 14 at most.

Such, after four months continuance, was the conclusion of the siege of Malta, which will be for ever memorable on account of that extraordinary display of the most generous and heroic valour by which the knights, so few in number, were enabled to baffle the most vigorous efforts which could be made to subdue them by the most powerful monarch in the world. The news of their deliverance gave universal joy to the Christian powers; and the name of the grand-master excited every where the highest admiration and applause. Congratulations were sent him from every quarter; and in many states public rejoicings were celebrated on account of his success.

With this siege is concluded every thing of importance in the history of Malta. The power of the Turks began about this time to be so much circumscribed, that they ceased to be formidable to the Christian nations, and the knights of Malta had no longer an opportunity of exerting their valour as formerly. They have remained ever since in quiet possession of their island, of which we have the latest description from Mr Brydome.

26  
Description  
of the  
island, &c.

"The approach of the island (says he) is very fine, although the shore is rather low and rocky. It is everywhere made inaccessible to an enemy, by an infinite number of fortifications. The rock, in many places, has been sloped into the form of a glacis, with strong parapets and intrenchments running behind it.—On getting ashore we found ourselves in a new world indeed.—The streets (of Valetta) crowded with well-dressed people, who have all the appearance of health and affluence; and we were conducted by the English consul to an inn, which had more the appearance of a palace.

"After dinner we went to visit the principal villas of the island; particularly those of the grand-master and the general of the galleys, which lie contiguous to one another. These are nothing great or magnificent; but they are admirably contrived for a hot climate, where, of all things, shade is the most desirable. The orange-groves are indeed very fine, and the fruit they bear superior to any thing of the kind in Spain or Portugal.

"The aspect of the country is far from being pleasing: the whole island is a great rock of very white free-stone; and the soil that covers this rock, is, in most places, not more than five or six inches deep; yet,

what is singular, we found their crop in general was exceedingly abundant. They account for it from the copious dews that fall during the spring and summer months; and pretend likewise that there is a moisture in the rock below the soil, that is of great advantage to the corn and cotton, keeping its roots perpetually moist and cool: without which singular quality, they say, they could have no crop at all; the heat of the sun being so exceedingly violent.—The whole island produces corn only sufficient to supply its inhabitants for five months or little more; but the crop they most depend upon is the cotton. They begin to sow it about the middle of May, and continue till the middle of June; and the time of reaping is in the month of October and beginning of November.

"They pretend that the cotton produced from this plant, which is sown and reaped in four months, is of a much superior quality to that of the cotton-tree. I compared them; but I cannot say I found it so: this is indeed the finest; but that of the cotton-tree is by much the strongest texture. The plant rises to the height of a foot and an half; and is covered with a number of nuts or pods full of cotton: These, when ripe, they are at great pains to cut off every morning before sun-rise; for the heat of the sun immediately turns the cotton yellow; which indeed we saw from those pods they save for seed.

"They manufacture their cotton into a great variety of stuffs. Their stockings are exceedingly fine. Some of them, they assured us, had been sold for ten sequins a pair. Their coverlets and blankets are esteemed all over Europe. Of these the principal manufactures are established in the little island of Gozso, where the people are said to be more industrious than those of Malta, as they are more excluded from the world, and have fewer inducements to idleness. Here the sugar-cane is still cultivated with success, though not in any considerable quantity.

"The Maltese oranges certainly deserve the character they have of being the finest in the world. The season continues for upwards of seven months, from November till the middle of June; during which time those beautiful trees are always covered with abundance of delicious fruit. Many of them are of the red kind, much superior, in my opinion, to the others, which are rather too luscious. They are produced, I am told, from the common orange-bud, ingrafted on the pomegranate stock. The juice of this fruit is as red as blood, and of a fine flavour. The greatest part of their crop is sent in presents to the different courts of Europe, and to the relations of the chevaliers.

"The industry of the Maltese in cultivating their little island is inconceivable. There is not an inch of ground lost in any part of it; and where there was not soil enough, they have brought over ships and boats loaded with it from Sicily, where there is plenty, and to spare. The whole island is full of inclosures of free-stone, which give the country a very uncouth and barren aspect; and in summer reflects such a light and heat, that it is exceedingly disagreeable and offensive to the eyes. The inclosures are very small and irregular, according to the inclination of the ground. This, they say, they are obliged to observe, notwithstanding the deformity it occasions; otherwise the

floods,

floods, to which they are subject, would soon carry off their foil.

"The island is covered over with country-houses and villages, besides seven cities, for so they term them; but there are only two, the Valetta, and Citta Vecchia, that by any means deserve that appellation. Every little village has a noble church, elegantly finished, and adorned with statues of marble, rich tapestry, and a large quantity of silver plate.

"The city of Valetta has certainly the happiest situation that can be imagined. It stands upon a peninsula between two of the finest ports in the world, which are defended by almost impregnable fortifications. That on the south side of the city is the largest. It runs about two miles into the heart of the island; and is so very deep, and surrounded by such high grounds and fortifications, that they assured us the largest ships of war might ride here in the most stormy weather, almost without a cable.

"This beautiful basin is divided into five distinct harbours, all equally safe, and each capable of containing an immense number of shipping. The mouth of the harbour is scarcely a quarter of a mile broad, and is commanded on each side by batteries that would tear the strongest ship to pieces before she could enter. Besides this, it is fronted by a quadruple battery, one above the other, the largest of which is a *fleur d'eau*, or on a level with the water. These are mounted with about 80 of their heaviest artillery: so that this harbour, I think, may really be considered as impregnable; and indeed the Turks have ever found it so, and I believe ever will.

"The harbour on the north side of the city, although they only use it for fishing, and as a place of quarantine, would, in any other part of the world, be considered as inestimable. It is likewise defended by very strong works; and in the centre of the basin is an island on which they have built a castle and a lazaret.

"The fortifications of Malta are indeed a most stupendous work. All the boasted catacombs of Rome and Naples are a trifle to the immense excavations that have been made in this little island. The ditches, of a vast size, are all cut out of the solid rock. These extend for a great many miles, and raise our astonishment to think that so small a state has ever been able to make them.

"One side of the island is so completely fortified by nature, that there was nothing left for art. The rock is of a great height, and absolutely perpendicular from the sea for several miles. It is very singular, that on this side there are still the vestiges of several ancient roads, with the tracks of carriages worn deep in the rocks. These roads are now terminated, by the precipice, with the seas beneath; and shew, to a demonstration, that this island has formerly been of a much larger size than it is at present; but the convulsion that occasioned its diminution is probably much beyond the reach of any history or tradition. It has been often observed, notwithstanding the very great distance of mount *Ætna*, that this island has generally been more or less affected by its eruptions; and they think it probable, that on some of these occasions a great part of it may have been shaken into the sea.

"One half of mount *Ætna* is clearly discovered

from Malta. They reckon the distance near 200 Italian miles. And the people of Malta affirm, that in great eruptions of the mountain, their whole island is illuminated, and from the reflection in the water there appears a great track of fire all the way from Malta to Sicily. The thundering of the mountain is likewise distinctly heard.

"We made an expedition through the island in coaches drawn by one mule each; the only kind of vehicle the island affords. The catacombs, not far from the ancient city of Melita, are a great work: they are said to extend for 15 miles under-ground. Many people, they assure us, have been lost in them by advancing too far; the prodigious number of branches making it next to impossible to find the way out again. The great source of water that supplies the city of Valetta takes its rise near to this place; and there is an aqueduct, composed of some thousand arches, that conveys it from thence to the city. The whole of this immense work was finished at the private expence of one of the grand-masters.

"Not far from the old city, there is a small church dedicated to St Paul; and, just by the church, a miraculous statue of the saint, with a viper on his hand; supposed to be placed on the very spot where the house stood in which he was received after his shipwreck on the island, and where he shook the viper off his hand into the fire without being hurt by it: at which time the Maltese assure us, the saint curled all the venomous animals of the island, and banished them for ever. Whether this be the cause of it or not, the fact is certain, that there are no venomous animals in Malta. They assured us, that vipers had been brought from Sicily, and died almost immediately on their arrival.

"Adjoining to the church, is the celebrated grotto in which the saint was imprisoned. It is looked upon with the utmost reverence and veneration; and if the stories they tell of it be true, it is well entitled to it. It is exceedingly damp, and produces (I believe by a kind of petrification from the water) a whitish kind of stone, which, they assure us, when reduced to powder, is a sovereign remedy in many distempers, and saves the lives of thousands every year. There is not a house in the island that is not provided with it: and they tell us there are many boxes of it sent annually, not only to Sicily and Italy, but likewise to the Levant, and to the East Indies, and (what is considered as a daily standing miracle) notwithstanding this perpetual consumption, it has never been exhausted, nor even sensibly diminished; the saint always taking care to supply them with a fresh quantity the day following. I tasted some of it, and believe it is a very harmless thing. It tastes like exceeding bad magnesia, and, I believe, has pretty much the same effects. They give about a teaspoonful of it to children in the small-pox and in fevers. It produces a copious sweat about an hour after, and, they say, never fails to be of service. It is likewise esteemed a certain remedy against the bite of all venomous animals. There is a very fine statue of St Paul, in the middle of this grotto, to which they ascribe great powers.

"The grand-master of the knights of Malta is more absolute, and possesses more power, than most sovereign princes. His titles are, *serene highness* and *eminence*; and his household-attendance and court are all very princely.



principely. As he has the disposal of all lucrative offices, he makes of his councils what he pleases; besides, in all the councils that compose the jurisdiction of this little nation, he himself presides, and has two votes. He has the disposal of 21 commanderies, and one priory, every five years; and as there is always a number of expectants, he is very much courted. He is chosen by a committee of 21; which committee is nominated by the seven nations, three out of each nation. The election must be over within three days of the death of the former grand-master; and, during these three days, there is scarce a soul that sleeps at Malta: all is cabal and intrigue; and most of the knights are masked, to prevent their particular attachments and connections from being known: the moment the election is over, every thing returns to its former channel.

"The laud-force of Malta is equal to the number of men in the island fit to bear arms. They have about 500 regulars belonging to the ships of war; and 150 compose the guard of the prince. The two islands of Malta and Gozzo contain about 150,000 inhabitants. The men are exceeding robust and hardy. I have seen them row for 10 or 12 hours without intermission, and without even appearing to be fatigued. Their sea-force consists of 4 galleys, 3 galliots, 4 ships of 60 guns, and a frigate of 36, besides a number of the quick-failing little vessels called *scampavias*, (literally *runaways*.) Their ships, galleys, and fortifications, are not only well supplied with excellent artillery, but they have likewise invented a kind of ordnance of their own, unknown to all the world besides. For we found, to our no small amazement, that the rocks were not only cut into fortifications, but likewise into artillery, to defend these fortifications, being hollowed out, in many places, into the form of immense mortars. The charge is said to be about a barrel of gunpowder, over which they place a large piece of wood, made exactly to fit the mouth of the chamber. On this they heap a great quantity of cannon-balls, shells, or other deadly materials; and when an enemy's ship approaches the harbour, they fire the whole into the air: and they pretend it produces a very great effect; making a shower for 200 or 300 yards round, that would sink any vessel.

"Notwithstanding the supposed bigotry of the Maltese, the spirit of toleration is so strong, that a mosque has been lately built for their sworn enemies the Turks. Here the poor slaves are allowed to enjoy their religion in peace. It happened lately that some idle boys disturbed them during their service; they were immediately sent to prison, and severely punished. The police indeed is much better regulated than in the neighbouring countries, and assassinations and robberies are very uncommon; the lack of which crimes the grand-master punishes with the utmost severity. He is said to be much more relaxed with regard to the first.

"Perhaps Malta is the only country in the world where duelling is permitted by law. As their whole establishment is originally founded on the wild and romantic principles of chivalry, they have ever found it too inconsistent with those principles to abolish duelling; but they have laid it under such restrictions as greatly to lessen its danger. These are curious enough. The duellists are obliged to decide their quarrel in one

particular street of the city; and if they presume to fight any where else, they are liable to the rigour of the law. But, what is not less singular, but much more in their favour, they are obliged, under the most severe penalties, to put up their swords when ordered to do so by a *woman*, a *priest*, or a *knight*. Under these limitations, in the midst of a great city, one would imagine it almost impossible that a duel could ever end in blood; however, this is not the case: a cross is always painted opposite to the spot where a knight has been killed, in commemoration of his fall. We counted about 20 of these crosses.

"About three months ago, (Mr Brydone's letter is dated June 7. 1770), two knights had a dispute at a billiard-table. One of them, after giving a great deal of abusive language, added a blow; but, to the astonishment of all Malta, (in whose annals there is not a similar instance), after to great a provocation, he absolutely refused to fight his antagonist. The challenge was repeated, and he had time to reflect on the consequences; but still he refused to enter the lists. He was condemned to make the *amende honorable* in the great church of St John for 45 days successively; then to be confined in a dungeon, without light, for five years; after which, he is to remain a prisoner in the castle for life. The unfortunate young man who received this blow is likewise in disgrace, as he has not had an opportunity of wiping it out in the blood of his adversary.

"The horse-races of Malta are of a very uncommon kind. They are performed without either saddle, bridle, whip, or spur; and yet the horses are said to run full speed, and to afford a great deal of diversion. They are accustomed to the ground for some weeks before; and although it is entirely over rock and pavement, there are very seldom any accidents. They have races of asses and mules performed in the same manner four times every year. The rider is only furnished with a machine like a shoemaker's awl, to prick on his courser if he is lazy.

"As Malta is an epitome of all Europe, and an assemblage of the younger brothers, who are commonly the best, of its first families, it is probably one of the best academies for politeness in this part of the globe; besides, where every one is entitled by law as well as custom, to demand satisfaction for the least breach of it, people are under a necessity of being very exact and circumspect, both with regard to their words and actions."

*Knights of MALTA*, otherwise called *Hospitalers of St John of Jerusalem*. A religious-military order, whose residence is in the island of Malta, situated in the Mediterranean Sea, upon the coast of Africa. The Knights of Malta, so famous for defending Christendom, had their rise as follows.

Some time before the journey of Godfrey of Bouillon into the Holy Land, some Neapolitan merchants, who traded in the Levant, obtained leave of the caliph of Egypt to build an house for those of their nation who came thither in pilgrimage, upon paying an annual tribute. Afterwards they built two churches, and received the pilgrims with great zeal and charity. This example being followed by others, they founded a church in honour of St John, and an hospital for the sick; whence they took the name of *Hospitalers*. A little

little after Godfrey of Bouillon had taken Jerusalem, in 1099, they began to be distinguished by black habits and a cross with eight points; and, besides the ordinary vows, they made another, which was to defend the pilgrims against the insults of the infidels. This foundation was completed in 1104, in the reign of Baldwin; and so their order became military, into which many persons of quality entered, and changed the name of *hospitalers* into that of *knights*.

When Jerusalem was taken, and the Christians lost their power in the East, the knights retired to Acre or Ptolemais, which they defended valiantly in 1290. Then they followed the king of Cyprus, who gave them Limassol in his dominions, where they staid till 1310. That same year they took Rhodes, under the grand-master Foulques de Villaret, a Frenchman; and next year defended it against an army of Saracens: since which the grand-masters have used these four letters, F. E. R. T. i. e. *Fortitudo ejus Rhodum tenuit*; and the order was then called *knights of Rhodes*.

In 1522, Soliman having taken Rhodes, the knights retired into Candia, and thence into Sicily. In 1530, Charles V. gave them the island of Malta, to cover his kingdom of Sicily from the Turks. In 1566, Soliman besieged Malta; but it was gallantly defended by the grand-master John de Valette Parifot, and the Turks obliged to quit the island with great loss.

The knights consisted of eight different languages or nations, of which the English were formerly the sixth; but at present they are but seven, the English having withdrawn themselves. The first is that of Provence, whose chief is grand commander of religion; the second, of Auvergne; whose chief is marshal of the order; the third, of France, whose chief is grand-hospitaler; the fourth, of Italy; and their chief, admiral; the fifth, of Arragon; and their chief, grand-conservator; the sixth, of Germany; and their chief, grand-bailiff of the order; the seventh, of Castile; and their chief, grand-chancellor. The chief of the English was grand-commander of the cavalry.

None are admitted into this order but such as are of noble birth both by father and mother's side for four generations, excepting the natural sons of kings and princes. The knights are of two sorts; those who have a right to be candidates for the dignity of grand-master, called *grand-crosses*; and those who are only *knights assistants*, who are taken from good families. They never marry; yet have continued from 1090 to the present time.

The order consists of three estates; the knights, chaplains, and servants at arms. There are also priests who officiate in the churches; friar-servants, who assist at the offices; and *domes*, or *demi-crosses*; but these are not reckoned as constituent parts of the body. This division was made in 1130, by the grand-master Raimond du Puy.

The government of the order is mixed, being partly monarchical, and partly aristocratical. The grand-master is sovereign, coins money, pardons criminals, and gives the places of grand-priors, bailiffs, knights, &c. The ordinary council is composed of the grand-master, and the grand-crosses. Every language has several grand priories, and every priory a certain number of commanderies.

The knights are received into this order, either by

undergoing the trials prescribed by the statutes, or by dispensation. The dispensations are obtained either by the pope's brief, or by a general chapter of the order, and are granted in case of some defect as to the nobility of their pedigree, especially on the mother's side. The knights are received, either as of age, under minority, or pages to the grand-master. They must be 16 years old complete before they are received: they enter into the noviciate at 17, and are professed at 18. They sometimes admit infants of one year old; but the expence is about 4000 livres. The grand-master has 16 pages who serve him, from 12 to 16 years of age. The knights wear on the left-side of their cloak or waistcoat a cross of white waxed cloth, with eight points, which is their true badge; that of gold being only for ornament. When they go to war against the Turks they wear a red cassock, with a great white cross before and behind, without points, which are the arms of the religion. The ordinary habit of the grand-master is a sort of cassock of tabby-cloth, tied about with a girdle, at which hangs a great purse, to denote the charitable institution of the order. Over this he wears a velvet gown; and on the left side a white cross with eight points. His yearly revenue is 10,000 ducats. He acknowledges the kings of Spain, and both the Sicilies, as his protectors; and is obliged, by his agreement with the emperor Charles V. to suppress pirates.

MALTON, a town of the north-riding of Yorkshire in England, seated on the river Derwent, over which there is a good stone-bridge. It is composed of two towns, the New and the Old; and is well inhabited, accommodated with good inns, and sends two members to parliament. W. Long. o. 30. N. Lat. 54. 8.

MALVA, the MALLOW; a genus of the polyandria order, belonging to the monadelphia class of plants. There are 24 species; consisting of herbaceous perennials, biennials, and annuals, for medical and ornamental uses; rising with erect stalks from about half a yard to 10 or 12 feet high, garnished with large, roundish, lobated leaves, and quinquepetalous flowers. They are all easily and plentifully raised from seed. The leaves of the common mallow are reckoned the first of the four emollient herbs: they were formerly in some esteem, as food, for loosening the belly; at present, decoctions of them are sometimes employed in dysenteries, heat, and sharpness of urine; and, in general, for obtunding acrimonious humours: their principal use is in emollient glysters, cataplasms, and fomentations. The leaves enter the official decoction for glysters, and a conserve is prepared from the flowers.

MALVEZZI (Virgilio marquis de), an Italian gentleman, born at Bologna, acquired great reputation by his learning and writings. He was well versed in polite literature, music, law, physic, and the mathematics. He served also in a distinguished post in the army of Philip IV. king of Spain, and was employed by him in some important negotiations. He died at Bologna, in the year 1654, leaving several works in Spanish and Italian. Among the latter, are his Discourses on the First Book of Tacitus: this work has been translated into English.

MALUS, in botany. See PYRUS.

MAMALUKES, the name of a dynasty that reigned in Egypt. See that article, n° 98.

Mamertum  
||  
Man.

Man.

**MAMBRUN** (Peter), an ingenious and learned French Jesuit, born in the diocese of Clermont, in the year 1581. He was one of the most perfect imitators of Virgil in Latin poetry, and his poems are of the same species: Thus he wrote *Eclogues*; *Georgics*, or four books on the culture of the soul and the understanding; together with a heroic poem intitled *Constantine, or Idolatry overthrown*. He shewed also great critical abilities in a Latin *Peripatetical dissertation on epic poetry*. He died in 1661.

**MAMERTUM**, or **MAMERTIUM**, (anc. geog.), an inland town of the Brutti. *Mamertini*, the people; said to have been expelled their country, and to have been hospitably received by the people of Messina in Sicily; and thus the Messanenese were called *Mamertini*. *Mamertinum Fretum*, the strait between Italy and Sicily.

**MAMMÆ**, in anatomy. See there, n° 376.

**MAMMON**, the god of riches, according to some authors; tho' others deny that the word stands for such a deity, and understand by it only riches themselves. Our Saviour says, *We cannot serve God and mammon*; that is, be religious and worldly-minded at the same time. Our poet Milton makes Mammon to be one of the fallen angels, and gives us his character in the following lines.

Mammon, the least erected spirit that fell  
From heav'n: for ev'n in heaven his looks and thoughts  
Were always downward bent; admiring more  
The riches of heav'n's pavement, trodden gold,  
Than ought divine, or holy elf enjoy'd,  
In beatific vision: by him first  
Man alse, and by his suggestion taught,  
Ranck'd the centre, and with impious hands  
Rifled the bowels of their mother earth,  
For treasures better hid. Soon had his crew  
Open'd into the hill a spacious wound,  
And digg'd our ribs of gold. Let none admire,  
That riches grow in hell; that soil may best  
Deserve the precious bane.

**MAMMÆA**, **MAMMEE-Tree**; a genus of the monogynia order, belonging to the polyandria class of plants. There are two species; both of them large ever-green trees of the hot parts of America and Asia, and retained here in hot-houses for variety; both of them adorned with large, oval, oblong, stiff leaves, and large quadripetalous flowers, succeeded by large round eatable fruit of a most exquisitely rich flavour. They are propagated by seed, which is to be sowed in small pots of light earth, and plunged in the bark-bed, where they will soon come up; give gentle waterings, and about August transplant them into separate pots a size larger, plunging them into the bark-bed, and giving shade and water till fresh-rooted. In this country they must never be taken out of the stove.

**MAN**, **HOMO**, in zoology, is justly reckoned as the head of the animal-part of the creation; making a distinct genus of that order of quadrupeds which Linnæus calls *anthropomorpha*, from their resemblance to the human form.

The same author distinguishes the race of mankind, according to their different colours, into the Europeans, or white men; the Americans, or ruddy-coloured men; the Asiatics, or tawney-coloured men; and those of Africa, or blacks.

*Noſce teipſum*, "Know thyself," is a precept worthy of the lawgiver of Athens, the ancient seat of polite

literature; an important branch of knowledge, which may be reduced to the following heads. 1. In a religious view, *theologicæ*, that you was created with an immortal soul, after the image of God. 2. In a moral sense, *moraliter*, that you alone was blessed with a rational soul, to be employed to the praise of the Creator. 3. With respect to the other works of the creation, *naturaliter*, that you are constituted their lord, for whose use they were made. 4. In a physiological sense, *physiologicæ*, the most perfect and amazing fabric of your body. 5. With regard to diet, *dieteticæ*, what things are useful, and what hurtful, in this respect. 6. In a pathological sense, *pathologicæ*, how frail you are, and how subject to a thousand calamities.

These are the heads which, according to Linnæus, comprehend the knowledge of man, considered as an individual; a branch of knowledge so essential to the human race, that, without it, he seems to doubt whether any other characters be sufficient to entitle one to be ranked among mankind: for he adds, *Hæc si noveris, homo es, et à reliquis animalibus distinctissimum genus*.

The whole of this work may, in some respect, be accounted an analysis of **MAN**; as comprehending his knowledge of God, of himself, and of natural and artificial objects.

*Island of Man*, an island in the Irish sea, lying about seven leagues north from Anglesey, about the same distance west from Lancashire, nearly the like distance south-east from Galloway, and nine leagues east from Ireland. Its form is long and narrow, stretching from the north-east point of Ayr to the Calf of Man, which lies south-west, at least 30 English miles. Its breadth in some places is more than nine miles, in most places eight, and in some not above five, and contains about 160 square miles.

The first author who mentions this island is Cæsar; for there can be as little doubt, that, by the *Mona*, of which he speaks in his Commentaries, placing it in the midst between Britain and Ireland, we are to understand *Man*; as that the *Mona* of Tacitus, which he acquaints us had a fordable freight between it and the continent, can be applied only to Anglesey. Pliny has set down both islands; *Mona*, by which he intends Anglesey, and *Monavia*, which is *Man*. In Ptolemy we find *Monaæda*, or *Monaïda*, that is, the farther or more remote Môn. Orosius styles it *Menavia*; tells us, that it was not extremely fertile; and that this, as well as Ireland, was then possessed by the Scots. Bede, who distinguishes clearly two Menavian islands, names this the *northern Menavia*, bestowing the epithet of *southern* upon Anglesey. In some copies of Nennius, this isle is denominated *Eubonia*; in others, *Menavia*; but both are explained to mean *Man*. Alore of Beverly also speaks of it as one of the Menavian islands. The Britons, in their own language, called it *Manaw*, more properly *Main au*, i. e. "a little island," which seems to be Latinized in the word *Menavia*. All which clearly proves, that this small isle was as early inhabited, and as well known to the rest of the world, as either Britain or Ireland.

In the close of the first century, the Druids, who were the priests, prophets, and philosophers of the old



old Britons, were finally expelled by Julius Agricola from the southern Mona; and we are told, that they then took shelter in the northern. This island they found well planted with firs; so that they had, in some measure, what they delighted in most, the shelter of trees; but, however, not the shelter of those trees in which they most delighted, viz. the oaks: and therefore these they introduced. No history tells us this; but we learn it from more certain authority, great woods of fir having been discovered interred in the bowels of the earth, and here and there small groves of oaks: but as these trees are never met with intermixed, so it is plain they never grew together; and as the former are by far the most numerous, we may presume them the natural produce of the country, and that the latter were planted and preserved by the Druids. They gave the people, with whom they lived, and over whom they ruled, a gentle government, wise laws, but withal a very superstitious religion. It is also very likely that they hindered commerce, as much as they could, from having any correspondence with their neighbours; which is the reason that, though the island is mentioned by so many writers, not one of them, before Orosius, says a word about the inhabitants. A little before his time, that is, in the beginning of the fifth century, the Scots had transported themselves thither, it is said, from Ireland. The tradition of the natives of Man (for they have a traditionary history,) begins at this period. They style this first discoverer *Mannan Mac Lear*; and they say that he was a magician, who kept this country covered with mists, so that the inhabitants of other places could never find it. But the ancient chronicles of Ireland inform us, that the true name of this adventurer was *Orfhenius*, the son of Alladius, a prince in their island; and that he was surnamed *Mannanan*, from his having first entered the island of Man, and *Mac Lir*, i. e. "the offspring of the sea," from his great skill in navigation. He promoted commerce; and is said to have given a good reception to St Patrick, by whom the natives were converted to Christianity.

The princes who ruled after him seem to have been of the same line with the kings of Scotland, with which country they had a great intercourse, assisting its monarchs in their wars, and having the education of their princes confided to them in time of peace.

In the beginning of the seventh century, Edwin, king of Northumberland invaded the Menavian islands, ravaged Man, and kept it for some time, when, Beda assures us, there were in it about 300 families; which was less than a third part of the people in Anglesey, though Man wants but a third of the size of that island.

The second line of their princes they derive from Orri, who, they say, was the son of the king of Norway; and that there were 12 princes of this house who governed Man. The old constitution, settled by the Druids, while they swayed the sceptre, was perfectly restored; the country was well cultivated, and well peopled; their subjects were equally versed in the exercise of arms, and in the knowledge of the arts of peace: in a word, they had a considerable naval force, an extensive commerce, and were a great nation, tho'

inhabiting only a little isle. Guttered the son of Orri built the castle of Ruffyn, A. D. 950, which is a strong place, a large palace, and has subsisted now above 800 years. Macao was the ninth of these kings, and maintained an unsuccessful struggle against Edgar, who reduced all the little sovereigns of the different parts of Britain to own him for their lord; and who, upon the submission of Macao, made him his high-admiral, by which title (*archiprimate*, in the Latin of those times,) he subscribes that monarch's charter to the abbey of Glastonbury.

After the death of Edward the Confessor, when Harold, who possessed the crown of England, had defeated the Norwegians at the battle of Stamford, there was amongst the fugitives one Goddard Crownan, the son of Harold the Black, of Iceland, who took shelter in the isle of Man. This isle was then governed by another Goddard, who was a descendant from Macao, and he gave him a very kind and friendly reception. Goddard Crownan, during the short stay he made in the island, perceived that his name-sake was universally hated by his subjects; which inspired him with hopes that he might expel the king, and become master of the island. This he at last accomplished, after having defeated and killed Fingal the son of Goddard, who had succeeded his father. Upon this he assigned the north part of the island to the natives, and gave the south to his own people; becoming, in virtue of his conquest, the founder of their third race of princes. However he might acquire his kingdom, he governed it with spirit and prudence; made war with success in Ireland; gained several victories over the Scots in the Isles; and, making a tour through his new-obtained dominions, deceased in the island of Islay. He left behind him three sons. A civil war breaking out between the two eldest, and both of them deceasing in a few years, Magnus king of Norway coming with a powerful fleet, possessed himself of Man and the isles, and held them as long as he lived; but, being slain in Ireland, the people invited home Olave, the youngest son of Goddard Crownan, who had fled to the court of England, and been very honourably treated by Henry the Second. There were in the whole nine princes of this race, who were all of them feudatories to the kings of England; and often resorted to their court, were very kindly received, and had pensions bestowed upon them. Henry III. in particular, charged Olave, king of Man, with the defence of the coasts of England and Ireland; and granted him annually for that service 40 marks, 100 measures of wheat, and five pieces of wine. Upon the demise of Magnus, the last king of this isle, without heirs-male, Alexander III. king of Scots, who had conquered the other isles, seized likewise upon this; which, as parcel of that kingdom, came into the hands of Edward I. who directed William Huntercumbe, guardian or warden of that isle for him, to restore it to John Baliol, who had done homage to him for the kingdom of Scotland.

But it seems there was still remaining a lady named *Austica*, who claimed this sovereignty, as cousin and nearest of kin to the deceased Magnus. This claimant being able to obtain nothing from John Baliol, applied herself next to king Edward, as the superior

Man.

lord. He, upon this application, by his writ, which is yet extant, commanded both parties, in order to determine their right, to appear in the king's-bench. The progress of this suit does not appear; but we know farther, that this lady, by a deed of gift, conveyed her claim to Sir Simon de Montacute; and, after many disputes, invasions by the Scots, and other accidents, the title was examined in parliament, in the seventh of Edward III. and solemnly adjudged to William de Montacute; to whom, by letters-patent, dated the same year, that monarch released all claim whatsoever.

In the succeeding reign, William Montacute, earl of Salisbury, sold it to Sir William Scroop, afterwards earl of Wiltshire; and, upon his losing his head, it was granted by Henry IV. to Henry Percy, earl of Northumberland; who, being attainted, had, by the grace of that king, all his lands restored, except the isle of Man, which the same monarch granted to Sir John Stanley, to be held by him of the kings his heirs and successors, by homage, and a cast of falcons to be presented at every coronation. Thus it was possessed by this noble family, who were created earls of Derby, till the reign of queen Elizabeth; when, upon the demise of earl Ferdinand, who left three daughters, it was, as lord Coke tells us, adjudged to those ladies, and from them purchased by William earl of Derby, the brother of Ferdinand, from whom it was claimed by descent, and adjudged to its present possessor, his grace the duke of Athol.

This island, from its situation directly in the mouth of the channel, is very beneficial to Britain, by lessening the force of the tides, which would otherwise break with far greater violence than they do at present. The air is sharp, but the winters are not severe; frosts seldom happen, and are of no great continuance; neither does snow lie long upon the ground. But they are frequently exposed to very high winds, and at other times to mists, which, however, are not at all unwholesome. The soil towards the north is dry and sandy, of consequence unfertile, but not unimprovable; the mountains, which may include near two-thirds of the island, are bleak and barren; yet afford excellent peat, and contain several kinds of metals. They maintain also a kind of small swine, called *puars*, which are esteemed excellent pork. In the valleys there is as good pasture, hay, and corn, as in any of the northern counties; and the southern part of the island is as fine soil as can be wished. They have marl and lime-stone sufficient to render even their poorest lands fertile; excellent slate, rag-stone, black marble, and some other kinds for building. They have vegetables of all sorts, and in the utmost perfection; potatoes in immense quantities; and, where proper pains have been taken, they have tolerable fruit. They have also hemp, flax, large crops of oats and barley, and some wheat. Hogs, sheep, goats, black cattle, and horses, they have in plenty; and, tho' small in size, yet if the country was thoroughly and skilfully cultivated, they might improve the breed of all animals, as experience has shown. They have rabbits and hares very fat and fine; tame and wild fowl in great plenty; and in their high mountains they have one airy of eagles, and two of excellent hawks. Their rivulets furnish them with salmon,

trout, eels, and other kinds of fresh-water fish; on their coasts are caught cod, turbot, ling, halibut, all sorts of shell-fish, (oysters only are scarce, but large and good), and herrings, of which they made anciently a great profit, though this fishery is of late much declined.

The commodities of this island are not many in number, nor of great value. Their slates are esteemed not inferior to any; their black marble is very hard, and bears a fine polish; and, occasionally, they export some of each, as they formerly did a little grain, and a considerable quantity of ale; but, of late years, both have been found hardly equal to the home-consumption. The rest are lambs-wool, hides, tallow, fish-oil, wax, and honey.

The inhabitants of Man, though far from being unmixed, were, perhaps, till within the course of the present century, more so than any other under the dominion of the crown of Great Britain; to which they are very proud of being subjects, though, like the inhabitants of Jersey and Guernsey, they have a constitution of their own, and a peculiarity of manners naturally resulting from a long enjoyment of it.—The Manks tongue is the only one spoken by the common people. It is the old British, mingled with Norse, or the Norwegian language, and the modern language. The clergy preach and read the common prayer in it; however, a short catechism, carefully taught in the schools, is the only printed book they have. In ancient times they were distinguished by their stature, courage, and great skill in maritime affairs. They are at this day a brisk, lively, hardy, industrious, and well-meaning people. Their frugality defends them from want: and though there are few that abound, there are as few in distress; and those that are, meet with a cheerful unconstrained relief. On the other hand, they are choleric, loquacious, and as the law till lately was cheap, and unencumbered with solicitors and attorneys, not a little litigious. The revenue, in the earl of Derby's time, amounted to about 2500 l. a-year; from which, deducting his civil list, which was about 700 l. the clear income amounted to 1800 l. At the same time the number of his subjects was computed at 20,000.—The sovereign of Man, though he has long ago waived the title of king, was still invested with regal rights and prerogatives; but the distinct jurisdiction of this little subordinate royalty, being found inconvenient for the purposes of public justice, and for the revenue, (it affording a commodious asylum for debtors, outlaws, and smugglers), authority was given to the treasury, by stat. 12. Geo. I. c. 28. to purchase the interest of the then proprietors for the use of the crown: which purchase was at length completed in the year 1765, and confirmed by stat. 5. Geo. III. c. 26. and 39.; whereby the whole island and all its dependencies, (except the landed property of the Athol family), their manorial rights and emoluments, and the patronage of the bishopric and other ecclesiastical benefices, are unalienably vested in the crown, and subjected to the regulation of the British excise and customs.

MANAGE. See MANAGE.

MANATI, in zoology. See TRICHECUS.

MANCA, was a square piece of gold coin, commonly valued at 30 pence; and *manca* was as much

Man

Manca.

**Manancel** as a mark of silver, having its name from *manu-cusi*, being coined with the hand. *Leg. Canut.* But the *manca* and *mancula* were not always of that value; for sometimes the former was valued at six shillings, and the latter, as used by the English Saxons, was equal in value to our half-crown. *Manca sex solidis æstimetur.* *Leg. H. 1. c. 69.* Thorn, in his chronicle, tells us, that *mancula est pondus duorum solidorum et sex denariorum*; and with him agrees Du Cange, who says, that 20 *manca* make 50 shillings. *Manca* and *mancula* are promiscuously used in the old books for the same money.

**MANCANCEL** or **MANCHENEEL.** See **HIPPO-MANE.**

**MANCHA**, a territory of Spain in the province of New Castile, lying between the river Guadiana and Andalusia. It is a mountainous country; and it was here that the famous Don Quixote was supposed to perform his exploits.

**MANCHESTER**, a town of Lancashire in England, situated in W. Long. 2. 42. N. Lat. 53. 27.—Of this place the Rev<sup>d</sup> Mr Whitaker has published a history in two octavo volumes; but as he does not confine himself merely to the town of Manchester, but takes in many particulars of the history and antiquities of other parts of Britain, and even Ireland, his work is incapable of abridgement; though in many places of this Dictionary we have made excerpts from particular passages of it.—He conjectures that the station was first occupied by the Britons about 500 B. C. but that it first received any thing like the form of a town 450 years after, or 50 B. C. when the Britons of Chelshire made an irruption into the territories of their southern neighbours, and of consequence alarmed the Seltuntii, or inhabitants of Lancashire, so much, that they began to build fortresses in order to defend their country. Its British name was *Mancenion*, which was changed by the Romans, who conquered it under Agricola, A. D. 79, into *Mancunium*; from whence comes the present name of *Manchester*.

The town is now very populous, large, and flourishing, and has several curious manufactures, known at London by the name of *Manchester goods*. Their velvets are lately come into great repute, and are much made use of for breeches. Its chief ornaments are the college, the market-place, and the collegiate church; which last has a small choir of excellent workmanship. There is also an elegant exchange, and a stone-bridge over the river Irwell, the arches of which are extremely high, on account of the nature of the river; which, descending from the mountainous part of the country, sometimes rises four or five yards in one night.—The town sends no members to parliament, but has the title of a duchy.

**MANCIPLE** (*manceps*), a clerk of the kitchen, or caterer; and an officer in the inner temple was antiently so called, who is now the steward there; of whom Chaucer, the ancient English poet, some time a student of that house thus writes:

A manciple there was within the temple,  
Of which all caterers might take example.

This officer still remains in colleges, in the universities.

**MANDAMUS**, in law, a writ that issues out of the court of king's-bench, sent to a corporation, com-

manding them to admit or restore a person to his office. This writ also lies where justices of the peace refuse to admit a person to take the oaths in order to qualify himself for enjoying any post or office; or where a bishop or archdeacon refuses to grant a probate of a will, to admit an executor to prove it, or to swear a church-warden, &c.

**MANDARINS**, a name given to the magistrates and governors of provinces in China, who are chosen out of the most learned men, and whose government is always at a great distance from the place of their birth. Mandarin is also a name given by the Chinese to the learned language of the country; for besides the language peculiar to every province, there is one common to all the learned in the empire, which is in China what Latin is in Europe; this is called the *mandarin tongue*, or the *language of the court*.

**MANDATE**, in law, a judicial commandment to do something. See the article **MANDAMUS**.

**MANDATE**, in the canon law, a rescript of the pope, commanding an ordinary collator to put the person therein named in possession of the first vacant benefice in his collation.

**MANDERSCHWEIT**, a town of Germany in the circle of the Lower Rhine, and in the electorate of Triers, capital of a county of the same name, between the diocese of Triers and the duchy of Juliers. E. Long. 6. 32. N. Lat. 50. 20.

**MANDEVILLE** (Sir John), a physician, famous for his travels, was born at St Alban's, about the beginning of the fourteenth century. He had a liberal education, and applied himself to the study of physic; but being at length seized with an invincible desire of seeing distant parts of the globe, he left England in 1332, and did not return till 34 years after. His friends, who had long supposed him dead, did not know him when he appeared. He had travelled through almost all the east, and made himself master of a great variety of languages. He particularly visited Scythia, Armenia the Greater and Less, Egypt, Arabia, Syria, Media, Mesopotamia, Persia, Chaldaea, Greece, Dalmatia, &c. His rambling disposition did not suffer him to rest; for he left his own country a second time, and died at Liege in the Netherlands, in 1372. He wrote an *Itinerary*, or an account of his travels, in English, French, and Latin.

**MANDEVILLE** (Bernard de), an eminent writer in the eighteenth century, was born in Holland, where he studied physic, and took the degree of doctor in that faculty. He afterwards came over into England, and in 1714 published a poem, intitled, "The Grumbling Hive, or Knaves turned honest," upon which he afterwards wrote remarks, and published the whole at London, 1723, in 8vo, under the title of, "The Fable of the Bees, or private Vice made public Benefits; with an Essay on Charity and Charity-schools, and a Search into the Nature of Society." This book was presented by the jury of Middlesex in July the same year, and severely animadverted upon in "A letter to the Right Honourable Lord C. printed in the London Journal of Saturday July 27. 1723." Our author published a vindication. His book was attacked by several writers, He published other pieces, and died in 1724.

**MANDRAGORA**, in botany. See **ATROPA.**



Mandrake  
Manganese

**MANDRAKE**, in botany. See **ATROPA**.  
**MANE**, the hair hanging down from a horse's neck; which should be long, thin, and fine; and if frizzled, so much the better.

**MANEGE**, or **MANAGE**, the exercise of riding the great horse; or the ground set apart for that purpose; which is sometimes covered, for continuing the exercise in bad weather; and sometimes open, in order to give more liberty and freedom both to the horseman and horse. See **HORSEMANSHIP**.

The word is borrowed from the French *manage*, and that from the Italian *maneggio*; or, as some will have it, a *manu agendo*, acting with the hand.

**MANES**, in the Pagan system of theology, a general name for the infernal deities or gods of hell.—The ancients comprehended under manes not only Pluto, Proserpine, and Minos; but the souls likewise of the deceased were taken into the number, and esteemed gods of hell. It was usual to erect altars and offer libations to the manes of deceased friends and relations. One branch of the magic art among the Pagans consisted in consulting the manes of the dead in matters of importance; this was called *necromancy*. See **NECROMANCY**.

**MANES**, the founder of the Manichean system. See **MANICHEES**.

**MANGANESE**, or **MAGNESIA NIGRA**; a mineral substance used in the tinging of glass. It is dense, ponderous, and heavy; in its purest and finest pieces approaching greatly to the colour of *lapis hematites*, being composed of regular parallel striae, diverging from a centre to the circumference. There is another kind, however, more common, of an iron-grey colour, and irregularly streaked like the steel-grained lead-ores.

But the most common manganese is entirely of an irregular structure. It is very heavy, moderately hard, and of a deep dusky grey, approaching to black; tho' sometimes of a ferruginous brown. It is found in many parts of England and Germany, in large masses, of a rude, rugged, and unequal surface. It is commonly supposed to be an ore of iron: but the experiments of Mr Pott and Mr Cronstedt shew, that this stone contains little or no iron; and therefore the latter author has made a distinct order of this earth, which he calls *terra magnesica*. It has the following properties: 1. It does not effervesce with acids, tho' they dissolve some part of it, especially when it is calcined: spirit of vitriol acquires from it a rose-colour: aqua regia also acquires colour, especially from the black kind. From these solutions fixed alkalies precipitate a white earth. 2. A small quantity of this earth mixed with glass frit, gives red or purplish colours to the glass: larger quantities give a deep purple, or even a black. Dr Lewis tells us, that preparations of iron, whose colour in glass, in a dilute state, is sometimes yellow, and sometimes greenish or bluish, are always of a dark brown or black when the glass is overfused with them: hence many of the ferruginous earthen stones melt into a black glass; as the coloured clays, several flates, and the stone called *volynn-stone*. Black glasses or enamels made on this principle, have, however, like the concentrated vegetable liquids, one imperfection; that though of a deep black colour when in masses of any considerable thickness, yet, when spread thin, they always betray some of the original

colour, or of the particular hue which they would have if the colouring matter was in less quantity. To this inconvenience the black glass made with manganese is likewise subject: and therefore the best method of obtaining a perfect black, is by mixing two or more of the above-mentioned darkening materials; and instead of taking colourless glass or enamel for the basis, to use fragments of different-coloured pieces, or compositions which have been spoiled in trying to tinge them of other colours.—The common black glass of which beads are made, is coloured with manganese only; and hence, when powdered, it looks of a dirty purple: the most perfect black used by the enamellers is composed of manganese, zaffre, and scales of iron. Manganese is also used to give a glazing to pottery. 3. Fused with nitre, or with fixed alkali; it gives to warm water various colours, green, purple, red, or blue; which change by agitating the water. 4. Cronstedt affirms, that it deflagrates with nitre; Pott says it does not. 5. Cronstedt says, that he has sometimes extracted a small quantity of tin from manganese. 6. The same author affirms, that the colours given by manganese to glass are easily destroyed by arsenic, or calces of tin. 7. Dr Lewis suspects, that it may increase the fusibility of glass. An ingenious friend, he tells us, observed, that in making impressions in different kinds of glass, he found this black sort to be by far the most fusible of any. 8. When manganese is fused with glass, a strong effervescence ensues, whence it may be presumed that these two substances act violently on each other.

**MANETHO**, an ancient Egyptian historian, who pretended to take all his accounts from the sacred inscriptions on the pillars of Hermes Trismegistus. He was high-priest of Heliopolis in the time of Ptolemy Philadelphus, at whose request he wrote his history in Greek; beginning from their gods, and continuing it down to near the time of Darius Codomanus who was conquered by Alexander the Great. His history of Egypt is a celebrated work, that is often quoted by Josephus and other ancient authors. Julius Africanus gave an abridgement of it in his Chronology. Manetho's work is however lost; and there only remain some fragments extracted from Julius Africanus, which are to be found in Eusebius's Chronica.

**MANFREDI** (Eustachio), a celebrated mathematician, born at Bologna in 1674, where he was elected mathematical professor in 1698. He was made a member of several academies, and acquired great reputation by his *Ephemerides*, 4 vols 4to, as well as by other works. He died in 1739.

**MANGE**, in dogs. See *Diseases of Dogs*.

**MANGE**, in farricry. See there, § xix.

**MANGER**, is a raised trough under the rack in the stall, made for receiving the grain or corn that a horse eats.

**MANGER**, a small apartment, extending athwart the lower-deck of a ship of war, immediately within the haufe-holes, and fenced on the after-part by a partition, which separates it from the other part of the deck behind it. This partition serves as a fence to interrupt the passage of the water, which occasionally gushes in at the haufe-holes, or falls from the wet cable whilst it is heaved in by the capstern. The water, thus prevented from running aft, is immediately returned into the

Manetho  
Manger.

Manget  
ll  
Manichees

the sea by several small channels, called *scuppers*, cut thro' the ship's side within the manger. The manger is therefore particularly useful in giving a contrary direction to the water that enters at the hause-holes, which would otherwise run aft in great streams upon the lower deck, and render it extremely wet and uncomfortable, particularly in tempestuous weather, to the men who mels and sleep in different parts thereof.

MANGET (John-James), an eminent physician, born at Geneva in 1652. The elector of Brandenburg made him his first physician in 1699; in which post he continued till his death, which happened at Geneva in 1742. He wrote many works; the most known of which are, 1. A collection of several *Pharmacopœias*, in folio. 2. *Bibliotheca pharmaceutico-medica*. 3. *Bibliotheca anatomica*. 4. *Bibliotheca chemica*. 5. *Bibliotheca chirurgica*. 6. A *bibliotheca* of all the authors who have written on medicine, in 4 vols folio. All these works are in Latin. Daniel le Clerc, the author of a history of physic, assisted him in writing them.

MANGIFERA, the MANGO-TREE; a genus of the monogynia order, belonging to the pentandria class of plants. There is but one species, a native of many parts of the East Indies, whence it has been transplanted to Brazil, and other warm parts of America. It grows to a large size; the wood is brittle, the bark rough when old; the leaves are seven or eight inches long, and more than two inches broad. The flowers are produced in loose panicles at the ends of the branches, and are succeeded by large oblong kidney-shaped plums. This fruit, when fully ripe, is greatly esteemed in the countries where it grows; but in Europe we have only the unripe fruit brought over in pickle. All attempts to propagate the plant have hitherto proved ineffectual; and Mr Miller is of opinion that the stones will not vegetate unless they are planted soon after they are ripe. He thinks therefore that the young plants ought to be brought over in boxes of earth; after which they may be kept in the tan-bed of the stove.

MANGROVE. See RHIZOPHORA.

MANHEIM, a town of Germany, in the Lower Palatinate, with a very strong citadel, and a palace, where the elector Palatine often resides. It is seated at the confluence of the rivers Neckar and Rhine, in E. Long. 8. 33. N. Lat. 49. 25.

MANIA, or MADNESS. See (the *Index* subjoined to) MEDICINE.

MANICHEES, or MANICHÆANS, Christian heretics, in the third century; followers of Manes, who made his appearance in the time of the emperor Probus. The history of this heresarch is very extraordinary, and is briefly as follows.

One Terebinthus, a disciple of Scythianus a magician, having retired out of Palestine into Persia, and finding his opinions and enterprises opposed by the priests and learned men of that country, was obliged to shelter himself in the house of a widow woman, where he was murdered. This woman being heirs to the money and books of Terebinthus, bought a slave named *Cubricus*, whom she afterwards adopted, and had him instructed in all the sciences of Persia. This man, after the death of the widow, changed his name, to blot out the memory of his former condition,

and took that of *Manes*, which, in the Persian language, signifies a *vessel*.

Some time after, from the books of Terebinthus, he began to broach an imposture, pretending to be the *Comforter* whom our Saviour promised to send into the world. This drew to him many followers, and he became the head of a numerous sect. He taught his disciples, that there are two principles, the one the author of all good, and the other the author of all evil: a doctrine which he borrowed from the Persian Magi.

Manes indulged his disciples in all manner of impurities, and forbade them to give alms to or assist any who were not of their own sect. He gave out, that the souls of his followers passed thro' the elements to the moon, and from thence to the sun, to be purified; and then went to God, and were re-united with his essence: as for the souls of all other men, they either went to hell, or were sent into other bodies. He alleged, that Christ had his residence in the sun, the Holy Ghost in the air, Wisdom in the moon, and the Father in the abyss of light. He denied the resurrection, and condemned marriage. He forbade the use of eggs, cheese, milk, and wine, as creatures proceeding from the bad principle. He used a different form of baptism from that of the church. He taught, that magistrates were not to be obeyed, and condemned the most lawful wars.

It would be tedious to rehearse all the impious tenets of this heresarch and his followers, of whom pope Leo used to say, that the devil, who reigned in all other heresies, had built a sortress and raised his throne in that of the Manichees, who embraced all the errors and impieties that the spirit of man is capable of.

The death of this heresarch was as dreadful as his life was impious. The king of Persia's son being sick, Manes undertook to cure him; upon which the father dismissed the physicians, and the patient died. Manes was thrown into prison, out of which he made his escape; but was soon after apprehended by the king's servants, who caused him to be sled alive, and his carcase thrown to the wild beasts.

The Manichees were divided into the *hearers* and the *elect*. Out of the latter they chose 12, in imitation of the 12 apostles: these were called *masters*. There was a 13th, who was a kind of patriarch, or pope, among them. In the fourth century, the emperors made severe laws against these heretics, and a council was held against them at Rome.

Although the Manichees professed to receive the books of the New Testament, yet, in effect, they took only so much of them as suited with their opinions, rejecting the rest as forged in by later writers. They published several apocryphal books, which they ascribed to the apostles.

The original writers tell us, that Manes, being desirous of passing among his followers for something more than human, shut himself up in a grotto, into which he had secretly conveyed provisions for a year; telling his disciples he was going to take a journey to heaven, and that he would return at the end of the year. Accordingly, when the year was expired, he came out of his retirement, bringing with him a book full of extraordinary images and figures, which he pretended to have received in heaven. This book they call

Manicor-  
don  
Manila.

call *ergen* and *esfen*.

**MANICORDON**, or **MANICHORD**, a musical instrument in form of a spinet; the strings of which, like those of the clarichord, are covered with little pieces of cloth, to deaden as well as to soften their sound, whence it is also called the *dumb spinet*.

**MANIFESTO**; a public declaration made by a prince in writing, showing his intentions to begin a war or other enterprise, with the motives that induce him to it, and the reasons on which he founds his rights and pretensions.

**MANIHOT**, or **MANIOC**. See **JATROPHA**.

**MANILA**, **LUCONIA**, or **Luzon**, the name of the largest of the Philippine islands in the East Indies, subject to Spain. It had the name of *Luzon* from a custom that prevailed among the natives of beating or bruising their rice in wooden mortars, before they either boiled or baked it; *luzon*, in their language, signifying a mortar.

As to situation, it is remarkably happy, lying between the eastern and western continents, and having China on the north, at the distance of about 60 leagues; the islands of Japan on the north-east, at the distance of about 250 leagues from the nearest of them; the ocean on the east; the other islands on the south; and on the west Malacca, Patana, Siam, Cambodia, Cochhin-China, and other provinces of India, the nearest at the distance of 300 leagues.

The middle of this island is in the latitude  $15^{\circ}$  north; the east point in  $13^{\circ} 30'$ , and the most northern point in  $19^{\circ}$ . The shape of it is said to resemble that of an arm bent; the whole length being about 160 Spanish leagues, the greatest breadth between 30 and 40, and the circumference about 350. As to the longitude, the charts differ, some making the middle of the island to lie  $113^{\circ}$  east from London, and others in  $160^{\circ}$ . The climate is hot and moist. One thing is held very extraordinary, that in stormy weather there is much lightning and rain, and that thunder is seldom heard till this is over. During the months of June, July, August, and part of September, the west and south winds blow, which they call *vendavales*, bringing such rains and storms, that the fields are all overflowed, and they are forced to have little boats to go from one place to another. From October till the middle of December, the north wind prevails; and from that time till May, the east and south-east; which winds are there called *breezes*. Thus there are two seasons in those seas, by the Portuguese called *monzons*; whence our word *monsoons*, that is, the breezes half the year, with a serene dry air; and the *vendavales* the other half, wet and stormy. It is further to be observed, that in this climate no vermin breed upon Europeans, though they wear dirty shirts, whereas it is otherwise with the Indians. The days here being always of an equal length, and the weather never cold, neither their clothes, nor the hour of dining, supping, doing business, studying, or praying, are ever changed; nor is cloth worn, but only against the rain.

The air here being, as has been observed, very hot and moist, is not wholesome; but is worse for young men, that come from Europe, than for the old. As for the natives, without using many precautions, they live very commonly to fourscore or 100. The soil is so

rich, that rice grows even on the tops of the mountains, without being watered; and this makes it so plentiful, that the Indians value gold so little as not to pick it up, though it lies almost every where under their feet.

Among the disadvantages of the island, besides frequent and terrible earthquakes, here are several burning mountains. The face of the island, however, is far from being disfigured by them, or by the consequences of their explosions.

The mountaineers, called *Tingiani*, have no particular place of abode, but always live under the shelter of trees, which serve them instead of houses, and furnish them with food; and when the fruit is eaten up, they remove where there is a fresh fort.

Here are 40 different sorts of palm-trees, the most excellent cocoas, wild cinnamon, wild nutmegs, and some say wild cloves also; ebony; sandal-wood; and the best cassia, and in such plenty, that they feed their hogs with its fruit; all kinds of cattle, and prodigious quantities of gold, amber, and ambergrife.

There are several sorts of people in this island besides the Spaniards, as the Tagalians or Tagalaze, the Pintadoes or painted negroes, the Ilayas or Tinglianos, and the Negrellos. The Tagalians, who are thought to be Malaysians by descent, are a modest, tractable, and well-disposed people. The Pintadoes, or painted negroes, are tall, straight, strong, active, and of an excellent disposition. The Tinglianos, whom some suppose to be descended from the Japanese, are very brave, yet very courteous and humane. They live entirely on the gifts of nature; and never sleep under any other shade than that of the trees or a cave. The Negrillos, who are held to be the Aborigines of the island, are barbarous and brutal to the last degree. When they kill a Spaniard, they make a cup of his skull and drink out of it.

This island is divided into several provinces, containing divers towns, the chief of which are Manila, Caceres, New-Segovia, Bondo, Passacao, Ibalon, Bulaw, Serfocon, or Bagatao, Lampon, Ferdinandina, Bolinao, Playahonda, Cavite, Mindora, Caleleya, and Balayan.

**MANILA**, the capital of an island of the same name in the East Indies, on the south-east side of the island, where a large river falls into the sea, and forms a noble bay 30 leagues in compass, to which the Spaniards have given the name of *Bahia*, because the river runs out of the great lake Bahi, which lies at the distance of six leagues behind it. In compass it is two miles, in length one third of a mile; the shape irregular, being narrow at both ends, and wide in the middle. On the south it is washed by the sea, and on the north and east by the river; being also strongly fortified with walls, bastions, forts, and batteries.—Manila contains about 30,000 souls, who are a very motley race, distinguished by several strange names, and produced by the conjunction of Spaniards, Chinese, Malabars, Blacks, and others inhabiting the city and islands depending on it. Without the walls are large suburbs, particularly that inhabited by the Chinese merchants, called *Sangleys*. In proportion to the size of the place, the number of churches and religious houses is very great. Only small vessels can up to Manila; but three leagues south of it is the town and port of Cavite, defended by the

Manila.



Manila.

the castle of St Philip and capable of receiving the largest ships. Here stands the arsenal where the galleons are built, for which there are from 300 to 600 or 800 men constantly employed, who are relieved every month, and while upon duty are maintained at the king's expence. By an earthquake which happened here in 1645, a third part of the city of Manila was destroyed, and no less than 3000 people perished in the ruins.

In the late war, Spain having entered into engagements with France, in consequence of the family-compact of the house of Bourbon, it was found expedient by Britain to declare war also against Spain. Whereupon a force was sent out from our East-India settlements, particularly Madras, for the conquest of the Philippine Islands, under general Draper and admiral Cornish: who, after a siege of 12 days, took Manila, on the 6th of October 1762, by storm; but, to save so fine a city from destruction, agreed to accept a ransom, amounting to a million sterling, a part of which, it is said, was never paid. The Spanish viceroy resides in this city, and lives like a sovereign prince. The government is said to be one of the best in the gift of the king of Spain. When the city was taken, as above, the archbishop, who is a kind of pope in this part of the world, was also viceroy. Five large ships, loaded with the riches of the East, as diamonds from Golconda, cinnamon from Ceylon, pepper from Sumatra and Java, cloves and nutmegs from the Moluccas and Banda islands, camphire from Borneo, benjamin and ivory from Cambodia, silks, tea, and china-ware from China, &c. sail yearly from hence to Acapulco in Mexico, and return freighted with silver, making 400 per cent. profit.

The city of Manila is governed by two alcaldes: the rest of the cities and great towns have each an alcalde; and in every village there is a corregidore. Appeals from their sentences are made to the royal court at Manila, in which there are four judges, and a fiscal or attorney-general; each of these judges has a salary of 3300 pieces of eight per annum. The viceroy is president; and in that quality has an income of 4000 pieces of eight, but he has no vote; yet if the judges are equally divided, the president names a doctor of the civil law, who, in virtue of his appointment, has a decisive voice. The attorney-general, in right of his office, is protector of the Chinese, in consideration of which he receives 600 pieces of eight every year. As for the Indians that are in subjection, they pay tribute in the following proportions: Young men from 18, and from thence, if they continue single, to the age of 60, pay five rials of plate by way of capitation; as single women likewise do from 24 to 50: married men pay ten rials. It is computed, that there are within the compass of this government 250,000 Indians, subject to his Catholic majesty, of whom two-fifths hold immediately from the king, and the rest from lords or proprietors, who pay two rials each for the maintenance of the forces, and the like sum for the parish-priest. The royal revenue is computed at about half a million of pieces of eight, exclusive of casualties. In regard to the military establishment, the garrison of Manila consists of about 800 or 1000 men, and there are about 3000 more in the Philippines. The viceroy is by his office cap-

tain-general, with a salary of about 4000 pieces of eight.

MANILIUS (Marcus), a Latin poet, whose poem had the ill luck to lie buried in some German libraries, and was not heard of in the world, until Poggius, about two centuries ago, published him from some old manuscripts he found there. There is no account to be found of him but what can be drawn from his poem, which is called *Astronomicum*; and contains a system of the ancient astronomy and astrology, together with the philosophy of the Stoics. It consists of five books; though there was a sixth, which has not been recovered. From the style, and no mention of the author being found in ancient writers, it is probable he died young. It is collected, however, that he was a Roman of illustrious extraction, and lived under the reign of Augustus, whom he invokes, though not by name, yet by circumstances and character that suit no other emperor. The best editions of Manilius are, that of Joseph Scaliger in 1600, and that of Bentley at London in 1738.

MANILLE, in commerce, a large brass ring in the form of a bracelet, either plain or engraved, flat or round.

Manilles are the principal commodities which the Europeans carry to the coast of Africa, and exchange with the natives for slaves. These people wear them as ornaments on the small of the leg, and on the thick part of the arm above the elbow. The great men wear manilles of gold and silver; but these are made in the country by the natives themselves.

MANIOC, or MANIHOT. See JATROPHA.

MANIPULUS, in Roman antiquity, a body of infantry, consisting of 200 men, and constituting the third part of a cohort. See COHORT.

Among physicians, the term *manipulus* signifies a handful of herbs or leaves, or so much as a man can grasp in his hand at once; which quantity is frequently denoted by the abbreviation, M, or m.

MANIS, the SCALY LIZARD, in zoology, a genus of quadrupeds belonging to the order of bruta, the characters of which are these: They have no foreteeth either in the upper or under jaw; the tongue is long and cylindrical; the snout is long and narrow; and the body is covered with hard scales. There are two species: 1. The pentadactyla, or scaly lizard, with five toes on each foot. The head is smaller than the neck; the eyes are very small; the length of the body including the tail, is from six to eight feet. The whole body is covered with hard scales, excepting the under-part of the head and neck, the breast, the belly, and the internal side of each leg. Betwixt the scales of this animal there are some hairs like the bristles of a hog, brownish at the points. The scales are of a reddish colour, very hard, convex above, and concave below. All the parts which want scales are naked. The scales are unconnected; and the animal can raise or lower them at pleasure, like the quills of the porcupine. When irritated, he erects his scales, and rolls himself up like a hedge-hog. In this situation, neither the lion, tiger, nor any other animal can hurt him. It is said to destroy the elephant by twisting itself round his trunk, and compressing that tender organ with its hard scales. It feeds on lizards and insects; turns up the ground with its nose; walks with  
its

Manilius

Manile

Manley  
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 Manlius.

its claws bent under its feet; grows very fat; and is esteemed delicate eating; makes no other noise than a kind of snorting. It is a mild inoffensive creature, is slow of motion, and has no other method of escaping the pursuit of man, but by concealing himself in crannies of rocks, and in holes which they dig in the ground, and where they likewise bring forth their young. It is a native of the East Indies, and is very rare. Mr Pennant conjectures that it may be a native of Guinea; the *quageli* of the Negroes, which, Des Marchais says, grows to the length of eight feet, of which the tail is four. It lives in woods and marshy places; feeds on ants, which it takes by laying its long tongue across their paths, which is covered with a viscid saliva, so that the insects which attempt to pass over it cannot extricate themselves.

2. The tetradactyla, or scaly lizard with four toes on each foot. This species is very similar to the former; only the tail of it is much longer in proportion to the body; and such parts as want scales, instead of being naked, are covered with a soft hair. It is also found in the East Indies. See Plate CLXII. fig. 4.

MANLEY (Mrs.) the celebrated writer of the *Atalantis*, was the daughter of Sir Roger Manley, the reputed author of the first volume of the *Turkish Spy*. She lost her parents very early; and after having been deluded into a false marriage by her guardian, who was her cousin, and afterwards deserted her, she was patronized by the duchess of Cleveland, mistress of Charles II. But the duchess, being a woman of a very sickle temper, grew tired of Mrs Manley in six months time; and discharged her upon a pretence, whether groundless or not is uncertain, that she intrigued with her son. After this she wrote her first tragedy, called *Royal Mischiefs*, which was acted with great applause in 1696; and her apartment being frequented by men of wit and gaiety, the soon engaged in amours, and was taken into keeping. Her pen now grew as licentious as her conduct: for, in her retired hours, she wrote four volumes, called *Memoirs of the New Atalantis*; in which she was not only very free in her wanton tales of love-adventures, but satirized the characters of many distinguished personages, especially those who had a principal concern in the Revolution. A prosecution was commenced against her for this work; but whether those in power were ashamed to bring a woman to trial for a few amorous trifles, or whether the laws could not reach her disguised satire, she was discharged; and a total change of the ministry ensuing, Mrs Manley lived in high reputation and gaiety, amusing herself with the conversation of wits, and writing plays, poems, and letters. She died in 1724.

MANLIUS (Capitolinus), the renowned Roman consul and general, who saved the capitol when it was attacked by the Gauls in the night: he was alarmed by the cries of geese, which were ever after held sacred. But being afterwards accused of aspiring at the sovereignty, he was thrown from the top of the capitol, 384 B. C. See GAUL and ROME.

MANLIUS (Torquatus), a celebrated consul and Roman captain; had great wit, but a difficulty in expressing himself, which induced Manlius Imperiosus, his father, to keep him almost by force in the country. Pompey, tribune of the people, enraged at this in-

stance of severity, formed a design of accusing Manlius the father before the judges; but Torquatus being informed of it, went to that tribune, and, with a poniard in his hand, made him swear that he would not proceed in that accusation against him to whom he owed his life. At length Torquatus was made military tribune, and killed a soldier of the Gauls in single combat, from whom he took a gold chain that he wore about his neck. From this action he obtained the name of *Torquatus*. He was consul in the war against the Latins; when he ordered his own son to be beheaded, for fighting contrary to his orders, tho' he had gained the victory. He conquered the enemies of the republic, and was several times made consul; but at last refused the consulship, saying, That it was no more possible for him to bear with the vices of the people, than it was for the people to bear with his severity.

MANNA, in the materia medica, the juice of certain trees of the ark kind, either naturally concentered on the plants, or exhaled and purified by art. There are several sorts of manna in the shops. The larger pieces, called *flake manna*, are usually preferred; though the smaller grains are equally good, provided they are white, or of a pale yellow colour; very light, of a sweet, not unpleasant taste, and free from any visible impurities. Some people injudiciously prefer the fat honey-like manna to the foregoing; this has either been exposed to a moist air, or damaged by sea or other water. This kind of manna is said to be sometimes counterfeited by a composition of sugar and honey, mixed with a little scammony; there is also a scititious manna, which is white and dry, said to be composed of sugar, manna, and some purgative ingredient, boiled to a proper consistence. This may be distinguished by its weight, solidity, untransparent whiteness, and by its taste, which is different from that of manna.

Manna is a mild, agreeable laxative; and may be given with safety to children and pregnant women: nevertheless, in some particular constitutions, it acts very unkindly, producing flatulencies and distensions of the viscera: these inconveniences may be prevented by the addition of any grateful warm aromatic. It operates so weakly, that it does not produce the full effect of a cathartic, unless taken in large doses; and hence it is rarely given in this intention by itself. It may be commodiously dissolved in the purging mineral waters, or joined to the cathartic salts, fenna, rhubarb, or the like. Geoffroy recommends acuating it with a few grains of emetic tartar: by this management, he says, bilious serum will be plentifully evacuated, without any nausea, gripes, or other inconvenience. It is remarkable, that the efficacy of this drug is greatly promoted, (if the account of Vallinieri is to be relied on) by a substance which is itself very slow of operation, viz. calia. See CASIA.

MANNA, is also a Scripture-term, signifying a miraculous kind of food which fell from heaven for the support of the Israelites in their passage through the wilderness, being in form of coriander-seeds, its colour like that of bdellium, and its taste like honey.

They called it *manna*, either from the Hebrew word *manah*, a "gift," to intimate its being a gift from heaven; or from *minnah*, which signifies "to prepare," because the manna came to them ready for eating, and needed

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needed no preparation but gathering; or from the Egyptian word, *man*, "what is it?" which last etymology seems the more probable, in regard the Scripture takes notice of the surprize they were under when they first saw this new food descend.

Salmasius, however, prefers another. According to him, the Arabs and Chaldeans used the word *man* to signify a kind of dew or honey that fell on the trees, and was gathered in great abundance on mount Libanus: on which footing, the Israelites did not use the term *manna* out of surprize, but because they found this food fall with the dew, in the same manner as the honey so well known under the name of *man*.

Salmasius adds, that the manna of the Israelites was in reality no other than that honey or dew condensed; and that the one and the other were the same with the wild honey wherewith St John was fed in the wilderness. So that the miracle did not consist in the formation of any new substance in favour of the Israelites; but in the punctual manner in which it was dispensed by Providence for the sustenance of so vast a multitude.

*MANNA-Tree*, is a species of the ash\*, called the *fraxinus rotundifolia*, a native of Calabria in Italy. The shoots of this tree are much shorter, and the joints closer together, than those of the common ash; the small leaves are shorter, and deeper sawed on their edges, and are of a lighter green. The flowers come out from the side of the branches, which are of a purple colour, and appear in the spring before the leaves come out. This tree is of humble growth, seldom rising more than 15 or 16 feet high in this country.

**MANNER**, in painting, a habitude that a man acquires in the three principal parts of painting, the management of colours, lights and shadows; which is either good or bad according as the painter has practised more or less after the truth, with judgment and study. But the best painter is he who has no manner at all. The good or bad choice he makes is called *gout*.

**MANNERS**, the plural noun, has various significations; as, The general way of life, the morals, or habits, of any person or people; also, Ceremonious behaviour, or studied civility. See the next article.

*Good-MANNERS*, according to Swift, is the art of making those people easy with whom we converse.

Whoever makes the fewest persons uneasy, is the best bred in the company.

As the best law is founded upon reason, so are the best manners. And as some lawyers have introduced unreasonable things into common law; so likewise many teachers have introduced absurd things into common good-manners.

One principal point of this art is to suit our behaviour to the three several degrees of men; our superiors, our equals, and those below us.

For instance, to press either of the two former to eat or drink, is a breach of manners; but a tradesman or a farmer must be thus treated, or else it will be difficult to persuade them that they are welcome.

Pride, ill-nature, and want of sense, are the three great sources of ill-manners: without some one of these defects, no man will behave himself ill for want of experience; or of what, in the language of fools, is called *knowing the world*.

"I defy (proceeds our author) any one to assign an incident wherein reason will not direct us what we are to say or to do in company, if we are not misled by pride or ill-nature. Therefore, I insist that good sense is the principal foundation of good-manners; but because the former is a gift which very few among mankind are possessed of, therefore all the civilized nations of the world have agreed upon fixing some rules for common behaviour, best suited to their general customs, or fancies, as a kind of artificial good-sense to supply the defects of reason. Without which, the gentlemanly part of dunces would be perpetually at odds, as they seldom fail when they happen to be drunk, or engaged in squabbles about women or play. And, God be thanked, there hardly happeneth a duel in a year, which may not be imputed to one of those three motives. Upon which account, I should be exceedingly sorry to find the legislature make any new laws against the practice of duelling; because the methods are easy, and many, for a wise man to avoid a quarrel with honour, or engage in it with innocence. And I can discover no political evil in suffering bullies, sharpers, and rakes, to rid the world of each other by a method of their own, where the law hath not been able to find an expedient.

"As the common forms of good-manners were intended for regulating the conduct of those who have weak understandings; so they have been corrupted by the persons for whose use they were contrived. For these people have fallen into a needless and endless way of multiplying ceremonies, which have been extremely troublesome to those who practise them, and insupportable to every body else; inasmuch that wife men are often more uneasy at the over-civility of these refinements, than they could possibly be in the conversations of peasants or mechanics.

"The impertinencies of this ceremonial behaviour are nowhere better seen than at those tables where ladies preside, who value themselves upon account of their good-breeding; where a man must reckon upon passing an hour without doing any one thing he hath a mind to, unless he will be so hardy as to break through all the settled decorum of the family. She determineth what he loveth best, and how much he shall eat; and if the master of the house happeneth to be of the same disposition, he proceedeth in the same tyrannical manner to prescribe in the drinking part: at the same time you are under the necessity of answering a thousand apologies for your entertainment. And although a good deal of this humour is pretty well worn off among many people of the best fashion, yet too much of it still remaineth, especially in the country; where an honest gentleman assured me, that having been kept four days against his will at a friend's house, with all the circumstances of hiding his boots, locking up the stable, and other contrivances of the like nature, he could not remember, from the moment he came into the house, to the moment he left it, any one thing wherein his inclination was not directly contradicted; as if the whole family had entered into a combination to torment him.

"But, besides all this, it would be endless to recount the many foolish and ridiculous accidents I have observed among these unfortunate proselytes to ceremony. I have seen a duchess fairly knocked down by the precipitancy of an officious coxcomb running to



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save her the trouble of opening a door. I remember, upon a birth-day at court, a great lady was rendered utterly disconsolate, by a dish of sauce let fall by a page directly upon her head-dress and brocade, while she gave a sudden turn to her elbow upon some point of ceremony with the person who sat next her. Monsieur Buys, the Dutch envoy, whose politics and manners were much of a size, brought a son with him about 13 years old, to a great table at court. The boy and his father, whatever they put on their plates, they first offered round in order, to every person in the company; so that we could not get a minute's quiet during the whole dinner. At last their two plates happened to encounter, and with so much violence, that, being china, they broke in twenty pieces, and stained half the company with wet sweetmeats and cream.

"There is a pedantry in manners as in all arts and sciences, and sometimes in trades. Pedantry is properly the over-rating any kind of knowledge we pretend to. And if that kind of knowledge be a trifle in itself, the pedantry is the greater. For which reason I look upon fiddlers, dancing-masters, heralds, masters of the ceremony, &c. to be greater pedants than Lipfius, or the elder Scaliger. With these kind of pedants, the court, while I knew it, was always plentifully stocked: I mean from the gentleman-usher (at least) inclusive, downward to the gentleman-porter; who are, generally speaking, the most insignificant race of people that this island can afford, and with the smallest tincture of good-manners, which is the only trade they profess. For being wholly illiterate, conversing chiefly with each other, they reduce the whole system of breeding within the forms and circles of their several offices: and as they are below the notice of ministers, they live and die in court under all revolutions, with great obsequiousness to those who are in any degree of credit or favour, and with rudeness and insolence to every body else. From whence I have long concluded, that good-manners are not a plant of the court-growth: for if they were, those people who have understandings directly of a level for such acquisitions, and who have served such long apprenticeships to nothing else, would certainly have picked them up. For as to the great officers who attend the prince's person or councils, or preside in his family, they are a transient body, who have no better a title to good-manners than their neighbours, nor will probably have recourse to gentleman-ushers for instruction. So that I know little to be learned at court on this head, except in the material circumstance of dress; wherein the authority of the maids of honour must indeed be allowed to be almost equal to that of a favourite actress.

"I remember a passage my lord Bolingbroke told me: That going to receive prince Eugene of Savoy at his landing, in order to conduct him immediately to the queen, the prince said he was much concerned that he could not see her majesty that night: for Monsieur Hoffman (who was then by) had assured his highness, that he could not be admitted into her presence with a tied-up periwig; that his equipage was not arrived; and that he had endeavoured in vain to borrow a long one among all his valets and pages. My lord turned the matter to a jest, and brought the prince to her majesty: for which he was highly censured by the whole tribe of gentlemen-ushers; among whom Monsieur

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Hoffman, an old dull resident of the emperor's, had picked up this material point of ceremony; and which, I believe, was the best lesson he had learned in five and twenty years residence.

"I make a difference between *good-manners* and *good-breeding*; although, in order to vary my expression, I am sometimes forced to confound them. By the first, I only understand the art of remembering, and applying, certain settled forms of general behaviour. But *good breeding* is of a much larger extent: for besides an uncommon degree of literature sufficient to qualify a gentleman for reading a play, or a political pamphlet, it taketh in a great compass of knowledge; no less than that of dancing, fighting, gaming, making the circle of Italy, riding the great horse, and speaking French; not to mention some other secondary or subaltern accomplishments, which are more easily acquired. So that the difference between good-breeding and good-manners lieth in this, That the former cannot be attained to by the best understandings without study and labour; whereas a tolerable degree of reason will instruct us in every part of good-manners without other assistance.

"I can think of nothing more useful upon this subject, than to point out some particulars wherein the very essentials of good-manners are concerned, the neglect or perverting of which doth very much disturb the good commerce of the world, by introducing a traffic of a mutual uneasiness in most companies.

"First, a necessary part of good-manners is a punctual observance of time at our own dwellings, or those of others, or at third places; whether upon matters of civility, business, or diversion: which rule, though it be a plain dictate of common reason, yet the greatest minister I ever knew, was the greatest trespasser against it; by which all his business doubled upon him, and placed him in a continual arrears. Upon which I often used to rally him as deficient in point of good-manners. I have known more than one ambassador, and secretary of state, with a very moderate portion of intellectuals, execute their office with great success and applause, by the mere force of exactness and regularity. If you duly observe time for the service of another, it doubles the obligation; if upon your own account, it would be manifest folly, as well as ingratitude, to neglect it; if both are concerned, to make your equal or inferior attend on you to his own disadvantage, is pride and injustice.

"Ignorance of forms cannot properly be styled *ill-manners*: because forms are subject to frequent changes; and consequently, being not founded upon reason, are beneath a wise man's regard. Besides, they vary in every country; and after a short period of time vary frequently in the same: so that a man who travels, must needs be at first a stranger to them in every court through which he passeth; and perhaps, at his return, as much a stranger in his own; and, after all, they are easier to be remembered or forgotten than faces or names.

"Indeed, among the many impertinencies that superficial young men bring with them from abroad, this bigotry of forms is one of the principal, and more predominant than the rest; who look upon them not only as if they were matters capable of admitting of choice, but even as points of importance; and therefore

\* Harley  
earl of Ox-  
ford, lord  
high trea-  
surer to  
queen Anne.

Manœuvre, fore are zealous upon all occasions to introduce and propagate the new forms and fashions they have brought back with them: so that, usually speaking, the worst-bred person in the company, is a young traveller just arrived from abroad."

MANŒUVRE, in a military sense, consists solely in distributing equal motion to every part of a body of troops, to enable the whole to form, or change their position, in the most expeditious and best method, to answer the purposes required of a battalion, brigade, or line, of cavalry, artillery, or infantry. It has always been lamented, that men have been brought on service without being informed of the uses of the different manœuvres they have been practising; and, having no ideas of any thing but the uniformity of the parade, instantly fall into disorder and confusion when they lose the step, or see a deviation from the straight lines they have been accustomed to at exercise. It is a pity to see so much attention given to show, and so little to instruct the troops in what may be of use to them in real service.—No manœuvre should be executed in presence of the enemy, unless protected by some division of the troops.

MANOMETER, or MANOSCOPE, an instrument to show or measure the alterations in the rarity or density of the air. The manometer differs from the barometer in this, That the latter only serves to measure the weight of the atmosphere, or of the column of air over it; but the former, the density of the air in which it is found; which density depends not only on the weight of the atmosphere, but also on the action of heat and cold, &c. Authors, however, generally confound the two together; and Mr Boyle himself gives us a very good manometer of his contrivance, under the name of a *statical barometer*, consisting of a bubble of thin glass, about the size of an orange, which, being counterpoised when the air was in a mean state of density, by means of a nice pair of scales, sunk when the atmosphere became lighter, and rose as it grew heavier.

Another kind of manometers were made use of by colonel Roy, in his attempts to correct the errors of the barometer, and are described in the Philosophical Transactions, Vol. LXVII. p. 689. "They were (says he) of various lengths, from four to upwards of eight feet: they consisted of straight tubes, whose bores were commonly from  $\frac{1}{16}$ th to  $\frac{1}{32}$ th of an inch in diameter. The capacity of the tube was carefully measured, by making a column of quicksilver, about three or four inches in length, move along it from one end to the other. These spaces were severally marked, with a fine-edged file, on the tubes; and transferred from them to long slips of pasteboard, for the subsequent construction of the scales respectively belonging to each. The bulb, attached to one end of the manometer at the glass-house, was of the form of a pear, whose point being occasionally opened, dry or moist air could be readily admitted, and the bulb sealed again; without any sensible alteration in its capacity.

"The air was confined by means of a column of quicksilver, long or short, and with the bulb downward or upwards, according to the nature of the proposed experiment. Here it must be observed, that, from the adhesion of the quicksilver to the tube, the instrument will not act truly, except it be in a vertical

position; and even then, it is necessary to give it a small degree of motion, to bring the quicksilver into its true place; where it will remain in equilibrio, between the exterior pressure of the atmosphere on one side, and the interior elastic force of the confined air on the other.

"Pounded ice and water were used to fix a freezing point on the tube; and by means of salt and ice, the air was farther condensed, generally four, and sometimes five or six degrees below zero. The thermometer and manometer were then placed in the tin vessel, among water which was brought into violent ebullition; where having remained a sufficient time, and motion being given to the manometer, a boiling point was marked thereon. After this the fire was removed, and the gradual descents of the piece of quicksilver, corresponding to every 20 degrees of temperature in the thermometer, were successively marked on a deal rod applied to the manometer. It is to be observed, that both instruments, while in the water, were in circumstances perfectly similar; that is to say, the ball and bulb were at the bottom of the vessel.

"In order to be certain that no air had escaped by the side of the quicksilver during the operation, the manometer was frequently placed a second time in melting ice. If the barometer had not altered between the beginning and end of the experiment, the quicksilver always became stationary at or near the first mark. If any sudden change had taken place in the weight of the atmosphere during that interval, the same was noted, and allowance made for it in afterwards proportioning the spaces.

"Long tubes, with bores truly cylindrical, or of any uniform figure, are scarcely ever met with. Such however as were used in these experiments, generally tapered in a pretty regular manner from one end to the other. When the bulb was downwards, and the tube narrowed that way, the column of quicksilver confining the air lengthened in the lower-half of the scale, and augmented the pressure above the mean. In the upper-half, the column being shortened, the pressure was diminished below the mean. In this case, the observed spaces both ways from the centre, were diminished in the inverse ratio of the heights of the barometer at each space, compared with its mean height. If the bore widened towards the bulb when downwards, the observed spaces, each way from the centre, were augmented in the same inverse ratio; but in the experiments on air less dense than the atmosphere, the bulb being upwards, the same equation was applied with contrary signs: and if any extraordinary irregularity took place in the tube, the corresponding spaces were proportioned both ways from that point, whether high or low, that answered to the mean.

"The observed and equated manometrical spaces being thus laid down on the pasteboard containing the measures of the tube; the 212° of the thermometer, in exact proportion to the sections of the bore, were constructed along-side of them: hence the coincidences with each other were easily seen; and the number of thermometrical degrees answering to each manometrical space readily transferred into a table prepared for the purpose."

MANOR, MANERIUM, (*à manendo*, because the usual residence of the owner,) seems to have been a

Manor.

Block.  
Commes.

district of ground, held by lords or great personages; who kept in their own hands so much land as was necessary for the use of their families, which were called *terre dominicales*, or *demesne lands*; being occupied by the lord, or *dominus manerii*, and his servants. The other, or *tenemental* lands, they distributed among their tenants; which, from the different modes of tenure, were called and distinguished by two different names.—First, *book land*, or charter-land, which was held by deed under certain rents and free services, and in effect differed nothing from free socage lands: and from hence have arisen most of the freehold tenants who hold of particular manors, and owe suit and service to the same. The other species was called *folk land*, which was held by no assurance in writing, but distributed among the common folk or people at the pleasure of the lord, and resumed at his discretion; being indeed land held in villenage. See VILLENAGE.

The residue of the manor, being uncultivated, was termed the *lord's waste*, and served for public roads, and for common of pasture to the lord and his tenants. Manors were formerly called *baronies*, as they still are *lordships*; and each lord or baron was empowered to hold a domestic court, called the *court-baron*, for redressing misdemeanors and nufances within the manor, and for settling disputes of property among the tenants. This court is an inseparable ingredient of every manor; and if the number of suitors should so fail, as not to leave sufficient to make a jury or homage, that is, two tenants at the least, the manor itself is lost.

In the early times of our legal constitution, the king's greater barons, who had a large extent of territory held under the crown, granted out frequently smaller manors to inferior persons to be held of themselves; which do therefore now continue to be held under a superior lord, who is called in such cases the *lord paramount* over all these manors: and his feignory is frequently termed an *honour*, not a *manor*; especially if it hath belonged to an ancient feudal baron, or hath been at any time in the hands of the crown. In imitation whereof, these inferior lords began to carve out and grant to others still more minute estates, to be held as of themselves, and were so proceeding downwards in *infinitum*, till the superior lords observed, that, by this method of subinfeudation, they lost all their feudal profits of wardships, marriages, and escheats, which fell into the hands of these mesne or middle lords, who were the immediate superiors of the *terre-tenant*, or him who occupied the land; and also that the mesne lords themselves were so impoverished thereby, that they were disabled from performing their services to their own superiors. This occasioned, first, that provision in the 32d chapter of *magna charta*, 9 Hen. III. (which is not to be found in the first charter granted by that prince, nor in the great charter of king John,) that no man should either give or sell his land, without reserving sufficient to answer the demands of his lord; and, afterwards, the statute of Westm. 3. or *quia emptores*, 18 Edw. I. c. 1. which directs, that, upon all sales, or feoffments of land, the feoffee shall hold the same, not of his immediate feoffor, but of the chief lord of the fee, of whom such feoffor himself held it. But these provisions not extending to the king's own tenants in *capite*, the

like law concerning them is declared by the statutes of *prærogativa regis*, 17 Edw. II. c. 6. and of 34 Edw. III. c. 15. by which last all subinfeudations, previous to the reign of king Edward I. were confirmed; but all subsequent to that period were left open to the king's prerogative. And from hence it is clear, that all manors existing at this day, must have existed as early as king Edward the First: for it is essential to a manor, that there be tenants who hold of the lord; and, by the operation of these statutes, no tenant *in capite* since the accession of that prince, and no tenant of a common lord since the statute of *quia emptores*, could create any new tenants to hold of himself. See VILLENAGE.

MANS, an ancient, rich, and populous town of France, capital of the county of Maine, with a bishop's see. Its wax and stuffs are famous. It is seated on a high hill near the river Sarre, in E. Long. 6. 10. N. Lat. 47. 58.

MANSFELD, a city of Germany, and capital of a county of the same name, in the circle of Upper Saxony. E. Long. 12. 55. N. Lat. 51. 35.

MANSFIELD, a town of Nottinghamshire in England, seated in the forest of Sherwood. It is a pretty large town, with good houses; drives a great trade, and is famous for malt. W. Long. 1. 6. N. Lat. 53. 12.

MANSIO, a term often mentioned in itineraries, denoting *inns* on the public roads to lodge in, at the distance of eighteen miles from each other; (Laëtantius). Also, in the lower ages, it came to denote "an encampment for one night," (Lamprius).

MANSIO, or *Manfus*, was sometimes also used in the same sense with *hide*; that is, for as much land as one plough could till in a year. See HIDE.

MANSE, MANSUS, *Manfa*, or *Manfum*; in ancient law-books, denotes an *house*, or habitation, either with or without land. See HOUSE, and MANSION. The word is formed à *manendo*, "abiding;" as being the place of dwelling or residence.

Capital MANSE, (*Manfum Capitale*.) denotes the *manor-house*, or *lord's court*. See MANOR, and COURT.

MANSUS *Presbyteri*, is a parsonage or vicarage house for the incumbent to reside in. This was originally, and still remains, an essential part of the endowment of a parish-church, together with the glebe and tythes. It is sometimes called *Presbyterium*. See PRESBYTERY.

MANSION, MANSIO, a dwelling-house, or habitation, especially in the country. See MANSE.

MANSION is more particularly used for the lord's chief dwelling-house within his fee; otherwise called the *capital messuage*, or chief manor-place. See MANOR.

MANSLAUGHTER, the unlawful killing of another, without malice either express or implied: Which may be either voluntarily, upon a sudden heat; or involuntarily, but in the commission of some unlawful act. These were called, in the Gothic constitutions, *homicidia vulgaria*; *quæ aut casu, aut etiam sponte committuntur, sed in subitaneo quodam iracundia calore et impetu*. And hence it follows, that in manslaughter there can be no accessories before the

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slaughter.



the fact; because it must be done without premeditation.

1. As to the first, or voluntary branch: If upon a sudden quarrel two persons fight, and one of them kills the other, this is manslaughter: and so it is, if they upon such an occasion go out and fight in a field; for this is one continued act of passion: and the law pays that regard to human frailty, as not to put a hasty and deliberate act upon the same footing with regard to guilt. So also if a man be greatly provoked, as by pulling his nose, or other great indignity, and immediately kills the aggressor, though this is not excusable *se defendendo*, since there is no absolute necessity for doing it to preserve himself; yet neither is it murder, for there is no previous malice; but it is manslaughter. But in this, and in every other case of homicide upon provocation, if there be a sufficient cooling-time for passion to subside and reason to interpose, and the person so provoked afterwards kills the other, this is deliberate revenge, and not heat of blood; and accordingly amounts to murder. So if a man takes another in the act of adultery with his wife, and kills him directly upon the spot; though this was allowed by the laws of Solon, as likewise by the Roman civil law, (if the adulterer was found in the husband's own house), and also among the ancient Goths; yet in England it is not absolutely ranked in the class of justifiable homicide, as in case of a forcible rape, but it is manslaughter. It is, however, the lowest degree of it; and therefore in such a case the court directed the burning in the hand to be gently inflicted, because there could not be a greater provocation. Manslaughter therefore, on a sudden provocation, differs from excusable homicide *se defendendo* in this: That in one case there is an apparent necessity, for self-preservation, to kill the aggressor; in the other no necessity at all, being only a sudden act of revenge.

2. The second branch, or involuntary manslaughter, differs also from homicide excusable by misadventure, in this; That misadventure always happens in consequence of a lawful act, but this species of manslaughter in consequence of an unlawful one. As if two persons play at sword and buckler, unless by the king's command, and one of them kills the other: this is manslaughter, because the original act was unlawful; but it is not murder, for the one had no intent to do the other any personal mischief. So where a person does an act, lawful in itself, but in an unlawful manner, and without due caution and circumspection; as when a workman flings down a stone or piece of timber into the street, and kills a man; this may be either misadventure, manslaughter, or murder, according to the circumstances under which the original act was done. If it were in a country village, where few passers by are, and he calls out to all people to have a care, it is misadventure only: but if it were in London, or other populous towns, where people are continually passing, it is manslaughter, though he gives loud warning; and murder, if he knows of their passing and gives no warning at all, for then it is malice against all mankind. And, in general, when an involuntary killing happens in consequence of an unlawful act, it will be either murder or manslaughter, according to the nature of the act which occasioned it. If it be in prosecution of a fe-

lonious intent, or in its consequences naturally tended to bloodshed, it will be murder; but if no more was intended than a mere civil trespass, it will only amount to manslaughter.

3. As to the punishment of this degree of homicide: The crime of manslaughter amounts to felony, but within the benefit of clergy; and the offender shall be burnt in the hand, and forfeit all his goods and chattels.

But there is one species of manslaughter, which is punished as murder, the benefit of clergy being taken away from it by statute; namely, the offence of mortally stabbing another, though done upon sudden provocation. See STABBING.

MANTA, in ichthyology. See RAJA.

MANTE, a considerable town of France, capital of the Mantois; seated on the river Seine, in E. Long. 1. 45. N. Lat. 48. 58.

MANTELETS, in the art of war, a kind of moveable parapets, made of planks about three inches thick, nailed one over another, to the height of almost six feet, generally cased with tin, and set upon little wheels, so that in a siege they may be driven before the pioneers, and serve as a blinds to shelter them from the enemy's small shot.

MANTINEA, (anc. geog.) a town situate in the fouth of Arcadia, on the confines of Laconia, (Ptolemy); called afterwards *Antigonea*, in honour of king Antigonus. It is memorable for a battle fought in its neighbourhood between the Thebans and Spartans, in which fell the celebrated commander Epaminondas. See THEBES.

MANTIS, in zoology, a genus of insects belonging to the order of hemiptera, the characters of which are these: The head bending forward, maxillous, and furnished with palpi: four membranaceous convoluted wings, the two lowermost plicated: the fore-feet compressed, ferrate-denticulated underneath; armed with a single claw, and a fetaceous, lateral-jointed toe: the thorax linear, long, and narrow. There are 14 species, of which the most remarkable is the *fiscifolia*, or walking-leaf, said to be brought from the Spanish West Indies: it is very flat-bodied; of the reddish colour of some dried leaves; the wings being a little more yellow, some of them inclining to green. Mr Edwards is of opinion, that they change from green to a reddish brown, according as the leaves of the trees change with the season of the year, in order the better to deceive birds that may feed on them. The hinder legs are perfect; but our author believes the outer joints of the four other legs broke off, and he did not care to supply them by conjecture. See Plate CLXVI. fig. 1.

MANTLE, or MANTLE-Tree, in architecture, the lower part of the chimney, or that piece of timber which is laid across the jaumbs, and sustains the compartments of the chimney-piece.

MANTLE, or *Mantling*, in heraldry, that appearance of folding of cloth, flourishing, or drapery, which in any achievement is drawn about a coat of arms. See HERALDRY, p. 3607.

MANTO, in poetic history, the daughter of Tiresias, and like her father strongly inspired with prophecy. She was in so great esteem, that, when the Argives pillaged Thebes, they thought they could not acquire

acquit their vow to Apollo, of consecrating to him the most precious thing in their plunder, without offering him this young woman. She was therefore sent to the temple of Delphi. But this did not engage her in any vow of continency; or, if it did, she observed it very ill. For she bore a son, called *Amphilocus*, to Alceon, who had been generalissimo of the army which took Thebes; and a daughter to the same, named *Tiphonne*. These children were the fruits of an amour carried on during the madness which had seized Alceon, after he had put his mother to death. Virgil transports her into Italy, not for the sake of securing her virginity, but to produce a son of her who built Mantua.

MANTUA, anciently a town of the Transpadana, in Italy, situated on the Mincius, a river running from the Lacus Benacus, (Pliny); a very old town, supposed to be older than Rome. It is still called *Mantua*, and is the capital of the duchy of that name. It is now a large place, having eight gates and about 16,000 inhabitants. The streets are broad and straight, and the houses well built. It is very strong by situation as well as by art; lying in the middle of a lake, or rather morass, formed by the river Minchio. There is no access to the city but by two causeways which cross this morass, and which are strongly fortified: so that the city is looked upon to be one of the most considerable fortresses of Europe; and the allies in 1745, tho' their army was in the duchy, durst not undertake the siege. It was greatly noted for its silk-manufactures, which are now much decayed. The air in the summer-time is very unwholesome. The celebrated poet Virgil was born at a village near this city. E. Long. 10. 47. N. Lat. 45. 10.

MANTUA, the duchy of, a country of Italy, lying along the river Po, which divides it into two parts. It is bounded on the north by the Veronese; on the south, by the duchies of Reggio, Modena, and Mirandola; on the east, by the Ferrarese; and on the west, by the Cremonese. It is about 50 miles in length, and 25 in breadth; is fruitful in corn, pastures, flax, fruits, and excellent wine. Charles IV. the last duke of Mantua, being a vassal of the empire, took part with the French, in the dispute relating to the succession of Spain; for which reason he was put under the ban of the empire, and died at Venice in 1708. He having no heirs, the emperor kept the Mantuan in his own hands, and the duke of Savoy had Montserrat, which were confirmed to them by subsequent treaties. After the death of the emperor, in 1740, his eldest daughter, now empress-queen, kept possession of the Mantuan; and the governor of the Milanese had the administration of affairs. The Mantuan comprehends the duchies of Mantua, Guastalla, and Sabioneta; the principalities of Castiglione, Solferino, and Bosolo; likewise the county of Novellara. The principal rivers are the Po, the Oglio, and the Minchio; and the principal town is Mantua.

MANTUAN (Baptist), a famous Italian poet, born at Mantua in 1448. He took his name from the town; not having a right to that of his father, as being a natural son. In his youth, he applied himself to Latin poetry, which he cultivated all his life; for it does not appear that he wrote any thing in Italian. He entered among the Carmelites, and became gene-

ral of the order; tho' he quitted that dignity upon some disgust in 1515, and died the year following. The duke of Mantua, some years after, erected a marble statue to his memory crowned with laurel, and placed it next to Virgil. His works were collected and published at Paris in three volumes folio in 1513, with the commentaries of St Morrhon, S. Brant, and I. Badius.

MANUAL, a word signifying any thing performed by the hand.

MANUAL (*manualis*), in law, signifies what is employed or used by the hand, and whereof a present profit may be made: as such a thing in the manual occupation of one is where it is actually used or employed by him.

MANUAL *Exercise*, in the army, consists in the observance of certain words of command appointed for this purpose. When a regiment is drawn up, or paraded for exercise, the men are placed three deep, either by companies, or divided into platoons, with the grenadiers on the right. When soldiers are drawn up for exercise, the ranks and files should be exactly even; and each soldier should be instructed to carry his arms well, to keep his firelock ready and even upon his shoulder, with the right hand hanging down, and the whole body without constraint. The distances between the files must be equal, and the ranks eight feet distant from each other. Every motion should be performed with life, and the greatest exactness observed in all firings, wheelings, and marching; and therefore a regiment should never be under arms longer than two hours.

The following is an abstract of the words of command at the manual exercise, with their explanations.

- 1. Poise your firelock:* i. e. Seize the firelock with your right hand, and turn the lock outwards, keeping the firelock perpendicular; then bring up the firelock with a quick motion from the shoulder, and seize it with the left hand, just above the lock, so that the fingers may lie upon the stock, with the elbows down, and the thumb upon the stock; the firelock must not be held too far from the body, and the left-hand must be of an equal height with the eyes.
- 2. Cock your firelock:* i. e. Turn the barrel opposite to your face, and place your thumb upon the cock, raising your elbow square at this motion; then cock your firelock, by drawing your elbow down, placing your right-thumb on the breech-pin, and the fingers under the guard.
- 3. Present:* i. e. Step back about six inches to the rear with the right-foot, bringing the left-toe to the front; at the same time the butt-end of the firelock must be brought to an equal height with the shoulder, placing the left-hand on the swell, and the fore-finger of the right-hand before the trigger, sinking the muzzle a little.
- 4. Fire:* i. e. Pull the trigger briskly, and immediately after, bringing up the right-foot to the inside of the left, come to the priming position, with the lock opposite to the right-breast, the muzzle to the height of the hat, keeping it firm and steady; and at the same time seize the cock with the fore-finger and thumb of the right-hand, the back of the hand being turned up.
- 5. Half-cock your firelock:* i. e. Half bend the cock briskly with a draw-back of the right-elbow, bringing it close to the butt of the fire-lock.
- 6. Handle your cartridge:* i. e. Bring your right-

right-hand with a short round to your pouch, slipping it hard; seize the cartridge, and bring it with a quick motion to your mouth; bite the top well off, and bring the hand as low as the chin, with the elbow down. 7. *Prime*: i. e. Shake the powder into the pan, placing the three last fingers behind the rammer, with the elbow up. 8. *Shut your pans*: i. e. Shut your pans briskly, drawing your right-arm at this motion towards your body, holding the cartridge fast in your hand, as before; then turn the piece nimbly round to the loading position, with the lock to the front, and the muzzle to the height of the chin, bringing the right-hand behind the muzzle, with both feet kept fast in this motion. 9. *Charge with cartridge*: i. e. Turn up your hand, and put the cartridge into the muzzle, shaking the powder into the barrel; place your hand, closed, with a quick and strong motion, upon the rammer. 10. *Draw your rammer*: i. e. Draw the rammer with a quick motion half out, seizing it at the muzzle back-handed; draw it quite out, turn it, and enter it into the muzzle. 11. *Ram down your charge*: i. e. Ram the cartridge well down in the barrel, instantly recovering and seizing the rammer back-handed at the centre, turning it, and entering it as far as the lower pipe, placing at the same time the edge of the hand on the butt-end of the rammer, with fingers extended. 12. *Return your rammer*: i. e. Return the rammer, bringing up the piece with the left-hand to the shoulder, seizing it with the right-hand under the cock, keeping the left-hand fast at the swell, turning the body square to the front. 13. *Shoulder your firelock*: i. e. Quit the left-hand, and place it strong upon the butt; quit the right-hand, and throw it down the right-side. 14. *Rest your firelock*: i. e. Seize the firelock with the right-hand, turning the lock outwards; raise the firelock from the shoulder, and place your left-hand with a quick motion above the lock, holding the piece right up and down in both hands before you, and your left-hand even with your eyes; step briskly back with your right-foot, placing it a hand's-breadth distance from your left-heel, and at the same time bring down your firelock as quick as possible to the rest, sinking it as far down before your left-hand as your right-hand will permit without constraint; your left-hand being at the feather-spring, and your right, with fingers extended, held under the guard, taking care to draw in the muzzle well towards your body, and to dress in a line with the butt-end. 15. *Order your firelock*: i. e. Place your firelock nimbly with your left-hand against your right-shoulder; quit the firelock with the right-hand, linking it at the same time with your left; seize it at the muzzle, which must be of an equal height with your chin, and hold it close against your right-side; lift up your right-foot, and place it by your left; at the same time throw back your left-hand by your left-side, and with your right bring down the butt-end strong upon the ground, placing it even with the toe of your right-foot; the thumb of your right-hand lying along the barrel, and the muzzle kept at a little distance from your body. 16. *Ground your firelock*: i. e. Half-face to the right upon your heels, and at the same time turn the firelock, so that the lock may point to the rear, and the flat of the butt-end lie against the inside of your foot; at the same time slipping the right-foot behind the

butt of the firelock, the right-toe pointing to the right, and the left to the front: step directly forward with your left-foot, about as far as the swell of the firelock, and lay it upon the ground, your left hand hanging down by your left-leg, and your right kept fast, with the butt-end against it; raise yourself up again nimbly, bringing back your left-foot to its former position, keeping your body faced to the right; face again to the left upon your heels, and come to your proper front, letting your hands hang down without motion. 17. *Take up your firelock*: i. e. Face to the right upon both heels; sink your body down, and come up to the position described in the second motion of grounding; raise yourself and firelock, bringing it close to your right-side; come to your proper front, seizing your firelock at the muzzle, as in explanation 15. 18. *Rest your firelock*: i. e. Bring your right-hand as far as the swell; raise the firelock high up in a perpendicular line from the ground with your right-hand, and seize it with your left above the spring, the cock being at the height of the waist belt; step back with your right-foot, placing it behind your left-heel, and come to the rest. 19. *Shoulder your firelock*: i. e. Lift up your right foot, and place it by your left; bring the firelock at the same time to your left-shoulder, and seize the butt-end with the left-hand, keeping it in the same position as above described; throw your right-hand briskly back. 20. *Secure your firelock*: i. e. Bring the right-hand briskly up, and place it under the cock, keeping the firelock steady in the same position; quit the butt with the left-hand, and seize the firelock with it at the swell, bringing the elbow close down upon the lock; the right-hand being kept fast in this motion, and the piece still upright; quit the right-hand, and bring it down your right-side, bringing the firelock nimbly down to the secure; the left-hand in a line with the waist-belt. 21. *Shoulder your firelock*: i. e. Bring the firelock up to a perpendicular line, seizing it with the right hand under the cock; quit the left-hand, and place it strong upon the butt; quit the right-hand, and bring it smartly down the right-side. 22. *Fix your bayonet*: i. e. First and second motions, as in the two first of the secure; quit the right-hand, and bring the firelock smartly down to the left-side with the left-hand, as far as it will admit without constraint, seizing the bayonet at the same time with the right-hand, and fixing it, placing that hand just below the brass, with the piece kept close to the hollow of the shoulder. 23. *Shoulder your firelock*: i. e. Quit the right-hand, and bring up the firelock with the left; seize it again under the cock with your right, as in the second motion of the secure; quit the left hand, and place it strong upon the butt; quit the right-hand, and bring it down the right-side. 24. *Present your arms*: i. e. as explained in three motions of the 14th word of command. 25. *To the right face*: i. e. Bring up the firelock with a quick motion high before you, till your left-hand comes even with your eyes, with the fingers of that hand extended along the stock, just above the feather spring, the right-foot to be brought close up to the left-heel in this motion; face to the right, taking care in facing to hold the firelock right up and down, and steady in your hands; step back with your right-foot, and come down to your present, as in the foregoing explanation. 26. *To the right face*



face; i. e. as in the foregoing explanation, facing to the right. 27. *To the right-about face*; i. e. as in the 25th explanation, only coming to the right-about instead of to the right. 28. *To the left face*: i. e. Bring the right-foot briskly to the hollow of your left, with the firelock in the same position as in the first motion of *facing to the right*; face to the left; come down to the *present*, as before. 29. *To the left face*; i. e. as in the foregoing explanation. 30. *To the left-about face*; i. e. as before, coming to the left-about instead of to the left. 31. *Shoulder your firelock*; i. e. as in the two motions of the 19th explanation. 32. *Charge your bayonet*; i. e. as in the first explanation: bring the swell of the firelock down strong upon the palm of the hand, grasping the piece at the small, behind the lock, and as high as the waist-belt; the firelock upon a level with the barrel upwards. 33. *Shoulder your firelock*: i. e. Bring up the firelock to the shoulder, place the left-hand upon the butt, bringing the feet square to the front; quit the right-hand, and throw it down the right side. 34. *Advance your arms*; i. e. first and second motions, as in the first explanation: bring the firelock down the right-side, with the right-hand as low as it will admit without constraint, slipping up the left-hand at the same time to the swell, the guard between the thumb and fore finger of the right-hand, the three last fingers under the cock, with the barrel to the rear; quit the left-hand. 35. *Shoulder your firelock*; i. e. bring up the left-hand, and seize it at the swell; come smartly up to the poise; shoulder. 36. *Prime and load*: i. e. Come smartly to the *recover*, by springing the firelock straight up with the left-hand, turning the barrel inwards to the proper height of the *recover*: at the same time that the left-hand springs the firelock, the right-hand is raised briskly from the right-side, and seizes the firelock across the breast: as it rises below the cock, the left-hand comes with a quick motion from the butt, and seizes the firelock strong above the lock, the little finger of the left-hand at the spring of the lock, the left-hand at an equal height with the face, the butt close to the body, but not pressed, the firelock perpendicular opposite the left-side of the face: bring the firelock down with a brisk motion to the priming position, the left-hand holding the firelock, as in priming; the thumb of the right-hand placed against the face of the steel, the fingers clinched, and the elbow a little turned out, that the wrist may be clear of the cock: open the pan, by throwing up the steel with a strong motion of the right arm, turning the elbow in, and keeping the firelock steady in the left-hand: handle your cartridge; prime; shut your pan; cast about; load; draw rammers; ram down the cartridge; return the rammers; shoulder. N. B. The motion of *recover*, and coming down to the priming position and opening pans, are to be done in the usual time. The motions of handling cartridge to shutting the pans, are to be done as quick as possible: when the pans are shut, a small pause is to be made, and then cast about together; then the loading motions are to be done as quick as possible; but before the rammer is returned, another small pause is to be made, counting 1, 2, between each motion, till the firelock is shouldered.—*Front rank, make ready*: i. e. Spring the firelock briskly to the *recover*, keeping the left-foot fast in this motion; as

soon as the firelock is at the *recover*, without any stop, sink the body briskly without slooping forward, with a quick motion down upon the right knee; the butt-end of the firelock at the same time falls upon the ground, the front part of the butt being in a line with the heel of the left-foot. As soon as the butt comes to the ground, the firelock is to be cocked, immediately seizing the cock and steel in the right-hand; the firelock to be held firm in the left-hand, about the middle of that part of the firelock between the lock and the swell of the stock; the point of the left-thumb to be close to the swell, pointing upwards. As the body is sinking, the right-knee is to be thrown as far back as the left-leg may be right up and down; the right foot to be thrown a little to the right; the body to be kept straight; the head up, looking to the right along the rank, the same as if shouldered; the firelock to be upright, and the butt about four inches to the right of the inside of the left-foot. *Present*: i. e. Bring the firelock briskly down to the *present*, by extending the left-arm to the full length with a strong motion; at the same time spring up the butt by the cock with the right-hand, and raise up the butt so high upon the right-shoulder, that you may not be obliged to stoop too much with the head; the right-check to be close to the butt, and the left-eye shut, and look along the barrel with the right-eye from the breech-pin to the muzzle; keep the left-elbow down in an easy position, and stand as steady as possible; the thumb of the right-hand to remain in the position as described in the third explanation of the manual. *Fired*: i. e. Pull the trigger as directed in the manual; and as soon as the piece is fired, give yourself a strong spring upon your left-leg, raising your body briskly, and straight up, keeping your left foot fast, and bringing the right-heel to the inside of the left; at the same time the firelock is to be brought up to the priming position, and half-cocked immediately: a short pause is to be made; then handle cartridge, and go on with the loading motions described in the explanation of *prime and load*.—*Centre rank, make ready*: i. e. Spring the firelock briskly to the *recover*; so soon as the left-hand seizes the firelock above the lock, the right-elbow is to be nimbly raised a little, placing the thumb of that hand upon the cock; the fingers open by the plate of the lock, and as quick as possible force the piece to the cock, by dropping the elbow, and forcing down the cock with the thumb, stepping at the same time a moderate pace to the right, keeping the left foot fast; as the firelock is cocked, the thumb is to fall below the cock, the right-hand seizing the firelock close under the cock, firmly, the fore-finger not to be before the trigger; the piece to be held in this position perpendicular, opposite the left-side of the face, the butt close to the left-breast, but not pressed; the body to be straight, and as full to the front as possible; the head kept up, looking to the right of the rank, that the body and the firelock may not stoop forward, nor lean much out of the rank. *Present*: i. e. Spring the firelock from the body to the arm's length with a quick motion, pressing down the muzzle with the left-hand, and spring up the butt with the right-hand, as in the foregoing explanation of the *front-rank*. *Fire*. As in explanation 4, in the manual, with this difference, that the left-foot is to be brought up to the right, at the same time that the firelock is brought

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Manotius.

brought down to the priming position. The loading motions as in the explanations of priming and loading; and at the last motion of shouldering, to spring to the left again, and cover the file-leaders.—*Rear rank make ready*: i. e. Recover the firelock, and cock as before directed for the centre rank; as the firelock is recovered and cocked, step briskly straight to the right, with the right-foot, a full pace; bring the left-heel about six inches before the right-foot; the body straight, and as square to the front as possible, as in the explanation of the centre rank. *Present*: As in explanation *present*, before. *Fire*: As in explanation of the centre rank; and as the firelock is coming down to the priming position, the left is to be brought back to the right; and at the last motion of shouldering, to spring to the left again, and cover the file-leader.

There are some peculiar words of command at the manual exercise of the grenadiers, when apart from the battalion; and also for the cavalry and artillery.

**MANUFACTURE**, a commodity produced by the work of the hand, as cloth, &c.

**MANUFACTURER**, one who works up a natural product into an artificial commodity.

**MANURE**, any thing used for fattening and improving land. See **AGRICULTURE**, Sect. I. II. and III.

**MANUSCRIPT**, in matters of literature, denotes a written book, in contradistinction to a printed book. See **BOOK**.

**MANUTIUS** (Aldus), the first of those celebrated Venetian printers, who were as illustrious for their learning, as for uncommon skill in their profession. He was born at Bassano in Italy, about the middle of the 15th century; and hence is sometimes called *Bassianus*, though generally better known by the name of *Aldus*. He was the first who printed Greek neatly and correctly; and acquired so much reputation by it, that whatever was finely printed, was proverbially said to have "come from the press of Aldus." We have a kind of Greek grammar of his, with notes upon Homer, Horace, &c.

**MANUTIUS** (Paulus), son of the former, was born at Venice in 1512. He was more learned than his father; and he acquired, by continual reading of Tully, such a purity in writing Latin, that even Scaliger allows, a Roman could not exceed. Pope Pius IV. placed him at the head of the apostolical press, and gave him the charge of the Vatican library. His Epistles are infinitely laboured, and very correct; but, as may be said of most of the Ciceronians, they contain scarcely any thing but mere words. This constant reading of Tully, however, together with his profound knowledge of antiquity, qualified him extremely well for an editor of Tully; whose works he accordingly published, with Commentaries on them, in 4 vols folio, at Venice in 1523. He died in 1574.

**MANUTIUS** (Aldus), the Younger, the son of Paulus, and the grandson of Aldus Manutius, was esteemed one of the greatest geniuses and most learned men of his time. Clement VIII. gave him the direction of the Vatican printing-house; but probably the profits of that place were very small, since Manutius was obliged, for his subsistence, to accept of a professor of rhetoric's chair, and to sell the excellent library that was in his family, which his father, his uncle, and his great-

Maon  
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Maragnan.

uncle, had collected with extraordinary care, and which it is said contained 80,000 volumes. He died at Rome in 1597, without any other recompense than the praises due to his merit. He wrote, 1. Commentaries on Cicero. 2. A treatise on orthography. 3. Three books of epistles; and other works in Latin and Italian, which are esteemed.

**MAON**, (anc. geog.), a town of the tribe of Judah, to the south-east, towards the Dead Sea. It gave name to the *wilderness of Maon*, 1 Sam. xxii.

**MAP**, a plain figure, representing the surface of the earth, or a part thereof, according to the laws of perspective. See **GEOGRAPHY**, n° 13—23.

**MAPLE**. See **ACER**.

**MAPLETOFT** (Dr John), descended from a good family in Huntingdonshire, was born in 1631. He was educated in Trinity-college, Cambridge, and qualified himself for the profession of physic; and in 1675 was chosen professor of that art at Gresham college. He translated Dr Sydenham's *Observationes Medicæ circa morborum acutorum historiam et curationem* into the Latin, and Sydenham dedicated them to Mapletoft. He married in 1679, and soon after transferred his studies from physic to divinity; took orders; obtained the vicarage of St Lawrence Jewry, with the lectureship of St Christopher's in London; and having been a benefactor to Sion college, was, in 1707, elected president. He continued to preach in his church of St Lawrence Jewry till he was above 80 years of age; and in his decline printed a book intitled *The principles and duties of the Christian religion*, &c. 8vo. 1710. a copy of which he sent to every house in his parish. He was a polite scholar; and beside some other pieces on moral and theological subjects, there are in the Appendix to Ward's Lives of the professors of Gresham-college, three Latin lectures read there by him, on the origin of the art of Medicine, and the history of its invention.

**MAPPARIUS**, in Roman antiquity, the officer who gave the signal to the gladiators to begin fighting; which he did by throwing an handkerchief that he had received from the emperor or other magistrate.

**MARACANDA** (anc. geog.), capital of the Sogdiana. Now thought to be *Samarcand*, a city of Ubec Tartary in Asia, the country and royal residence of Tamerlane. See **SAMARCAND**.

**MARACAYBO**, a rich and considerable town of South America, and capital of the province of Venezuela, seated near a lake of the same name. It carries on a great trade in skins and chocolate, which is the best in America; and they have likewise very fine tobacco. It was taken by the French buccaners in 1666 and 1678. W. Long. 70. 45. N. Lat. 10. 0.

**MARACAYBO**, a lake in South America, 200 miles long and 100 broad, which discharges itself by a river into the North Sea. It is well defended by strong forts; which, however, did not hinder Sir Henry Morgan, a buccaneer, from entering it, and plundering several Spanish towns on the coast, after defeating a squadron sent out against him.

**MARAGNAN**, a province of Brazil in South America, which comprehends a fertile populous island, 112 miles in circumference. The French settled here in 1612, and built a town; but they were soon driven

Maraldi  
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Maranta.

from thence by the Portuguese, who have possessed it ever since. The town is little, but strong; and has a castle, a harbour, and a bishop's see. The climate is very agreeable and wholesome, and the soil produces plenty of all the necessaries of life. W. Long. 54. 35. S. Lat. 2. 0.

MARALDI (James Philip), a learned mathematician and astronomer, of the academy of sciences at Paris, was born in 1665. He was the son of Francis Maraldi and Angela Catharine Caffini, the sister of the famous astronomer of that name. His uncle made him go to France in 1687, where he acquired great reputation on account of his learning and observations. He made a catalogue of the fixed stars, which is more particular and exact than Bayer's; and has given a great number of curious and interesting observations in the memoirs of the academy; in particular, those on bees and petrifications have been universally applauded. He died in 1729.

MARANA (John Paul), an ingenious writer of the 17th century, was of a distinguished family, and born at Genoa; where he received an education suitable to his birth, and made a great progress in the study of polite literature and the sciences. Having been engaged in the conspiracy of Raphael della Terra, to deliver up Genoa to the duke of Savoy, he was in 1670, when 28 years of age, imprisoned in the tower of that city, and remained there four years. Being at length set at liberty, he was ordered to write the history of that conspiracy; but, when finished, it was seized, and prevented from being published. When the republic of Genoa was at variance with the court of France, Marana, who had always an inclination for that court, was afraid of being imprisoned a second time; and retired to Monaco, where he again wrote the history of the conspiracy in Italian; and, in 1682, went to Lyons to get it printed. From Lyons he went to Paris, where his merit soon acquired him powerful protectors. He spent the rest of his life in a happy and tranquil mediocrity, devoted to study and the society of men of learning; and died in 1693. His history of the conspiracy contains many curious and interesting anecdotes, which are nowhere else to be found. He also wrote several other works; the most known of which is the Turkish Spy, in 6 vols 12mo, which was in 1742 augmented to seven. Of this ingenious work we have an excellent English translation.

MARANO, a town of Italy, in the territory of Venice and province of Friuli, with a strong citadel; seated in a marsh at the bottom of the Gölph of Venice, which renders it difficult of access.

MARANS, a rich town of France, in the territory of Aunis and diocese of Rochelle, seated among salt marshes, near the river Sevre, three miles from the sea. It carries on a very great trade in corn; and is seated in W. Long. 0. 55. N. Lat. 46. 20.

MARANTA, INDIAN ARROW-ROOT; a genus of the monogynia order, belonging to the monandria class of plants. There are two species, the arundinacea and galansea, both of them herbaceous perennial exotics of the Indies, kept here in hot-houses for curiosity: they have thick, knotty, creeping roots, crowned with long, broad, arundinaceous leaves, ending in points, and upright stalks, half a yard high, terminated by bunches of monopetalous, ringent, five-parted flowers.

They are propagated by parting the roots in spring, and planting them in pots of light rich earth, and then plunging them in the bark-bed. The root of the galanga is used by the Indians to extract the *virius* communicated by their poisoned arrows; from whence it has derived its name of *arrow root*.

MARASMUS, among physicians, denotes an atrophy or consumption in its last and most deplorable stage.

MARATHON, (anc. geog.), one of the demi or hamlets of Attica; about 10 miles to the north-east of Athens, towards Boeotia, near the sea; famous for the victory of the Athenians over the Persians under Miltiades; and for the Marathonian bull slain by Theseus, (Plutarch, Ovid). Near Marathon is a bog, into which the Persians plunging in their flight stuck fast, and were slain by the conquerors.

MARATTI (Carlo), a celebrated painter, was born at Camorano, near Ancona, in 1625. He came a poor boy to Rome, when only 11 years old; and at 12 recommended himself so effectually to Andrea Sacchi, by his drawings after Raphael in the Vatican, that he took him into his school, where he continued 25 years till his master's death. His graceful and beautiful ideas occasioned his being generally employed in painting madonas and female saints. No man ever performed in a better style, or with a greater elegance. From the finest statues and pictures, he made himself master of the most perfect forms, and the most charming airs of heads, which he sketched with equal ease and grace. He has produced a noble variety of draperies, more artfully managed, more richly ornamented, and with greater propriety than even the best of the moderns. He was inimitable in adorning the head, in the disposal of the hair, and the elegance of his hands and feet, which are equal to those of Raphael; and he particularly excelled in graces. In his younger days he etched a few prints, as well of his own invention as after others, with equal spirit and correctness. It would be endless to recount the celebrated paintings done by this great man. Yet he executed nothing slightly, often changed his design, and almost always for the better, whence his pictures were long in hand. By the example of his master, he made several admirable portraits of popes, cardinals, and other people of distinction, from whom he received the highest testimonies of esteem, as he likewise did from almost all the monarchs and princes of Europe. Innocent XI. appointed him keeper of the paintings in his chapel and the Vatican. Maratti erected two noble monuments for Raphael and Hannibal, at his own expense, in the Pantheon. How well he maintained the dignity of his profession, appears by his answer to a Roman prince, who complaining of the excessive price of his pictures, he told him there was a vast debt due from the world to the famous artists his predecessors, and that he, as their rightful successor, was come to claim those arrears. His abilities in painting were accompanied with many virtues, and particularly with an extensive charity. This great painter died at Rome in 1713, in the 88th year of his age.

MARAUDING, in a military sense, means a party of soldiers, who, without any order, go into the neighbouring houses and villages, when the army is either in camp or garrison, to plunder and destroy, &c. Marauders are a disgrace to the camp, to the military profession,

Marasmus  
||  
Marauding.



feffion, and deferve no better quarter from their officers than they give to poor peafants, &c.

MARBLE, in natural hiftory, a genus of foßils; being bright and beautiful ftones compofed of fmall feparate concretions, moderately hard, not giving fire with fteel, fermenting with and foluble in acid menftrua, and calcining in a flight fire.—The word comes from the French *marbre*, and that from the Latin *marior*, of the Greek *μαριον*, to “fhine or glitter.”

The colours of marbles being a very obvious and ftriking character, they are arranged according to them in the following divifions. 1. Of the white plain marbles there are two forts; the Parian marble of the ancients, and ftatuary marble of the moderns, an extremely bright and elegant marble; and the Carara marble, a very fine marble, more compact and clofe than the former, but lefs bright. 2. Of the plain yellowifh marbles there is only one fort, which is a hard, pale yellow, and gloffy marble, found in many parts of Italy. 3. Of the bluish and black marbles there are a great many fpecies, as the China marble, bafaltic, &c. 4. Of the plain green marbles there is only one kind, the Lacedæmonian marble of the ancients. 5. The pale coloured or whitifh brown, commonly called *Darby marble*. 6. The green marbles with fhells. 7. The black caralloide marble, with and without fhells. 8. Of the white variegated marbles there are a great many fpecies, variegated with purple, brown, red, blue, &c. 9. Of the brown variegated marbles there are likewife feveral forts, fome with red veins, others with white, black, or brown veins. 10. Of the yellow-veined and variegated marbles, fome are veined with purple, and others with blue. 11. Of the black variegated marbles, fome are veined with white, and others with blue, yellow, red, &c. 12. The green variegated marbles are likewife diftinguifhed by the colour of their veins. 13. The gray spotted marbles are variegated, fome with black, and others with green fots. 14. The red variegated marble is the brocatello of the Italians, with white and gold veins.

Marble, when chemically examined, appears to confift of calcareous earth united with much fixed air; and is, like limestone or chalk, capable of being converted into a ftrong quicklime.—Dr Black derives the origin of marbles, as well as limestone and marle, from the fame fource, viz. from the calcareous matter of fhells and lithophyta. In one kind of limestone known by the name of *Portland ftone*, and confifting of round grains united together, it was fuppofed to be compofed of the fpawn of fifh; but comparifons of other phenomena have explained it. It is plain that it has been produced from a calcareous fand, which is found on the fhore of fome of the iflands in the fouthern climates. By the conflant agitation the fofter parts are wore off, and the harder parts remain in the form of particles that are highly polifhed, and which are afterwards gradually made to concrete together by caufes of which we have yet no knowledge.—There are indeed fome few of the limestones and marbles in which we cannot difcover any of the relics of the fhells; but there are many figns of their having been in a difolved or liquified ftate; fo we cannot expect to fee the remains of the form of the fhells: but even in many of the marbles that have the greateft appearance of a complete mixture, we ftill find often the confufed remains of the

fhells of which they have been originally compofed. We fhould ftill find it difficult to conceive how fuch mafles fhould have derived their origin from fhells; but, confidering the many collections that we have an opportunity of feeing in their fteps towards this procefs, and a little concreted together, fo that by their going a ftap further they might form limestone and marbles, we fhall foon fee the poffibility of their being all produced in the fame manner. Thus vaft quantities of fhells have been found in the province of Turia in France; and indeed there is no place where they have not been found. The lithophyta likewife feem to be a very fruitful fource of this kind of earth. In the cold climates, where the moderate degree of heat is not fo productive of animal-life, we have not fuch an opportunity of obferving this: but in the hot climates, the fea, as well as the fand, fwarms with innumerable animals; and, at the bottom, with thofe that produce the corals and madripores. We learn from the hiftory of a fhip that was funk in a ftorm in the Gulf of Mexico, the vaft growth there is of thefe bodies. About 30 years after, they attempted to dive into it to get out a quantity of filver; but they found great difficulty in getting it, from the fhip being overgrown with coral. Sir Hans Sloan, in the Philofophical Tranfactions, and in his hiftory of Jamaica, obferves, that the fhip's timber, the iron, and money, were all concreted by the growth of the calcareous matter. So in a tract of many thoufands of years the quantity of it fhould be very great; and as this is going on through a very great extent of the bottom of the fea, it will produce very extenfive as well as mafly collections of calcareous matter.

**Colouring MARBLE.** This is a nice art; and, in order to fucceed in it, the pieces of marble on which the experiments are tried, muft be well polifhed, and free from the leaft fpot or vein. The harder the marble is, the better will it bear the heat neceffary in the operation; therefore alabafter and the common foft white marble are very improper for performing thefe operations upon.

Heat is always neceffary for opening the pores of marble, fo as to render it fit to receive the colours: but the marble muft never be made red-hot; for then the texture of it is injured, and the colours are burnt, and lofe their beauty. Too fmall a degree of heat is as bad as one too great; for, in this cafe, though the marble receives the colour, it will not be fixed in it, nor ftrike deep enough. Some colours will ftrike even cold; but they are never fo well funk in as when a juft degree of heat is ufed. The proper degree is that which, without making the marble red, will make the liquor boil upon its furface. The menftrums ufed to ftrike in the colours muft be varied according to the nature of the colour to be ufed. A livivum made with horfe's or dog's urine, with four parts of quicklime, and one of pot-afhes, is excellent for fome colours; common ley of wood-afhes is very good for others; for fome, fpirit of wine is belt; and laftly, for others, oily liquors, or common white-wine.

The colours which have been found to fucceed belt with the peculiar menftrums, are thefe. Stone-blue difolved in fix times the quantity of fpirit of wine, or of the urinous livivum, and that colour which the painters call *litmus*, difolved in common ley of wood-afhes.

Marble.

ashes. An extract of saffron, and that colour made of backhorn berries, and called by painters *sap-green*, both succeed well when dissolved in urine and quicklime; and tolerably well when dissolved in spirit of wine. Vermilion, and a very fine powder of cochineal, also succeed very well in the same liquors. Dragon's-blood succeeds in spirit of wine, as does also a tincture of logwood in the same spirit. Alkanet-root gives a fine colour: but the only menstruum to be used for it is oil of turpentine; for neither spirit of wine, nor any lixivium, will do with it. There is another kind of *sanguis draconis*, commonly called *dragon's-blood in tears*, which, mixed with urine, gives a very elegant colour.

Besides these mixtures of colours and menstrooms, there are other colours which must be laid on dry and unmixed. These are, Dragons-blood of the purest kind, for a red; gamboge, for a yellow; green wax, for a green; common brimstone, pitch, and turpentine, for a brown colour. The marble for these experiments must be made considerably hot, and then the colours are to be rubbed on dry in the lump. Some of these colours, when once given, remain immutable, others are easily changed or destroyed. Thus, the red colour given by dragon's-blood, or by a decoction of logwood, will be wholly taken away by oil of tartar, and the polish of the marble not hurt by it.

A fine gold colour is given in the following manner: Take crude sal ammoniac, vitriol, and verdigrise, of each equal quantities. White vitriol succeeds best; and all must be thoroughly mixed in fine powder.

The staining of marble to all the degrees of red or yellow, by solutions of dragon's-blood or gamboge, may be done by reducing these gums to powder, and grinding them with the spirit of wine in a glass mortar. But, for smaller attempts, no method is so good as the mixing a little of either of those powders with spirit of wine in a silver spoon, and holding it over burning charcoal. By this means a fine tincture will be extracted: and, with a pencil dipt in this, the finest traces may be made on the marble while cold; which, on the heating of it afterwards, either on sand, or in a baker's oven, will all sink very deep, and remain perfectly distinct on the stone. It is very easy to make the ground-colour of the marble red or yellow by this means, and leave white veins in it. This is to be done by covering the places where the whiteness is to remain with some white paint, or even with two or three doubles only of paper; either of which will prevent the colour from penetrating. All the degrees of red are to be given to marble by this gum alone; a slight tincture of it, without the assistance of heat to the marble, gives only a pale flesh-colour: but the stronger tinctures give it yet deeper; to this the assistance of heat adds greatly; and finally, the addition of a little pitch to the tincture, gives it a tendency to blackness, or any degree of deep red that may be desired.

A blue colour may be given also to marble by dissolving turnsole in lixivium, in lime and urine, or in the volatile spirit of urine; but this has always a tendency to purple, whether made by the one or the other of these ways. A better blue, and used in an easier manner, is furnished by the Canary turnsol, a substance well known among the dyers. This needs

only to be dissolved in water, and drawn on the place with a pencil: it penetrates very deeply into the marble; and the colour may be increased, by drawing the pencil wetted afresh several times over the same lines. This colour is subject to spread and diffuse itself irregularly: but it may be kept in regular bounds, by circumscribing its lines with beds of wax, or any such substance. It is also to be observed, that this colour should always be laid on cold, and no heat given even afterwards to the marble: and one great advantage of this colour is, that it is therefore easily added to marbles already stained with other colours, is a very beautiful tinge, and lasts a long time.—For other methods of staining marble, see CHEMISTRY, n° 197.

*Arundel* MARBLES, ancient marbles with a chronicle of the city of Athens inscribed on them many years before our Saviour's birth; presented to the university of Oxford by Thomas earl of Arundel, whence the name.

MARBLING, the method of preparing and colouring the marbled paper.

There are several kinds of marbled paper; but the principal difference of them lies in the forms in which the colours are laid on the ground: some being disposed in whirls or circumvolutions; some in jagged lengths; and others only in spots of a roundish or oval figure. The general manner of managing each kind is, nevertheless, the same; being the dipping the paper in a solution of gum-tragacanth, or, as it is commonly called, *gum-dragon*; over which the colours, previously prepared with ox-gall and spirit of wine, are first spread.

The peculiar apparatus necessary for this purpose, is a trough for containing the gum-tragacanth and the colours; a comb for disposing them in the figure usually chosen; and a burnishing stone for polishing the paper. The trough may be of any kind of wood; and must be somewhat larger than the sheets of paper, for marbling which it is to be employed: but the sides of it need only rise about two inches above the bottom; for by making it thus shallow, the less quantity of the solution of the gum will serve to fill it. The comb may be also of wood, and five inches in length; but should have brass teeth, which may be about two inches long, and placed at about a quarter of an inch distance from each other. The burnishing stone may be of jasper, or agate; but as those stones are very dear when of sufficient largeness, marble or glass may be used, provided their surface be polished to a great degree of smoothness.

These implements being prepared, the solution of gum-tragacanth must be made, by putting a sufficient proportion of the gum, which should be white and clear from all foulness, into clean water; and letting it remain there a day or two, frequently breaking the lumps and stirring it, till the whole shall appear dissolved, and equally mixed with the water. The consistence of the solution should be nearly that of strong gum-water, used in miniature-painting; and if it appear thicker, water must be added; or if thinner, more of the gum. When the solution is thus brought to a due state, it must be passed through a linen cloth; and being then put into the trough, it will be ready to receive the colours.

Marble,  
Marbling.

Marbling.

The colours employed for red are carmine, lake, rose-pink, and vermillion; but the two last are too hard and glaring, unless they be mixed with rose-pink, or lake, to bring them to a softer cast; and with respect to the carmine and lake, they are too dear for common purposes:—for yellow, Dutch pink and yellow oker may be employed:—for blue, Prussian blue and verditer may be used:—for green, verdigrise, a mixture of Dutch pink and Prussian blue, or verditer, in different proportions:—for orange, the orange-lake, or a mixture of vermillion, or red lead, with Dutch pink:—for purple, rose-pink and Prussian blue.

These several colours should be ground with spirit of wine till they be of a proper fineness; and then, at the time of using them, a little fish-gall, or in default of it the gall of a beaf, should be added, by grinding them over again with it. The proper proportion of the gall must be found by trying them; for there must be just so much as will suffer the spots of colour, when sprinkled on the solution of the gum-tragacanth, to join together, without intermixing or running into each other.

When every thing is thus prepared, the solution of the gum-tragacanth must be poured into the trough; and the colours, being in a separate pot, with a pencil appropriated to each, must be sprinkled on the surface of the solution, by shaking the pencil, charged with its proper colour, over it; and this must be done with the several kinds of colour desired, till the surface be wholly covered.

When the marbling is proposed to be in spots of a simple form, nothing more is necessary: but where the whirls or snail-shell figures are wanted, they must be made by means of a quill; which must be put among the spots to turn them about, till the effect be produced. The jagged lengths must be made by means of the comb above described, which must be passed through the colours from one end of the trough to the other, and will give them that appearance: but if they desired to be pointed both ways, the comb must be again passed through the trough in a contrary direction; or if some of the whirls or snail-shell figures be required to be added, they may be yet made by the means before directed.

The paper should be previously prepared for receiving the colours, by dipping it over-night in water; and laying the sheets on each other with a weight over them. The whole being thus ready, the paper must be held by two corners, and laid in the most gentle and even manner on the solution covered with the colours; and there softly pressed with the hand, that it may bear every-where on the solution. After which it must be raised and taken off with the same care, and then hung to dry across a proper cord, subtended near at hand for that purpose: and in that state it must continue, till it be perfectly dry. It then remains only to give the paper a proper polish: in order to which, it is first rubbed with a little soap; and then must be thoroughly smoothed by the glass polifhers, such as are used for linen, and called the *calender glasses*. After which it should be again rubbed by a burnisher of jasper, or agate; or, in default of them, of glass ground to the highest polish: for on the perfect polish of the paper depends in a great measure its

beauty and value.

Gold or silver powders may be used, where desired, along with the colours; and require only the same treatment as them, except that they must be first tempered with gum-water.

Marbling of books or paper is performed thus: Dissolve four ounces of gum-arabic into two quarts of fair water; then provide several colours mixed with water in pots or shells; and, with pencils peculiar to each colour, sprinkle them by way of intermixture upon the gum-water, which must be put into a trough or some broad-vessel; then with a stick curl them, or draw them out in streaks, to as much variety as may be done. Having done this, hold your book or books close together, and only dip the edges in, on the top of the water and colours, very lightly; which done, take them off, and the plain impression of the colours in mixture will be upon the leaves; doing as well the ends as the front of the book in the like manner.

Marbling a book on the covers is performed by forming clouds with aqua fortis or spirit of vitriol mixed with ink, and afterwards glazing the covers. See the article BOOK-BINDING.

MARCA (Peter de), one of the greatest ornaments of the Gallican church, was born in Bearn, of an ancient family, in 1594. He first studied the law, was made president of the parliament of Bearn, and, going to Paris in 1639, was made a counsellor of state: the good opinion entertained of his knowledge was confirmed by his *Histoire de Bearn*. By the king's order he published a work, *De concordia sacerdotii et imperii, sive de libertatibus ecclesie Gallicae*, in refutation of a book that appeared under the title of *Opusculum Gallus*; and on this account, when on the death of his wife he was nominated bishop of Conserans, the court of Rome refused the bulls in his favour, until by another book he explained away all he had said on behalf of the state, to the limitation of the papal power. He obtained his confirmation, after seven years suspense, in 1648; was translated to the archbishopric of Toulouse in 1652; and was made minister of state in 1658. He died at Paris in 1662, a short time after he had received the bulls as the archbishop of that metropolis. After his death appeared his *Posthumous works*, with prefaces, notes, &c. by M. Baluze. In all he wrote, he shewed great abilities and learning, but is reproached for accommodating them to his views of interest and ambition.

MARCASITE, in mineralogy. This name has long been given indifferently to all sorts of minerals; to ores, pyrites, and to semimetals. Lately, it seems to be confined to pyrites, and Wallerius proposes to confine it to such pyrites as are regularly formed. This seems to be better than to leave it a vague and indeterminate signification, on account of the ambiguity and obscurity which might thereby be introduced. See PYRITES.

MARCELLINUS (Ammianus.) See AMMIANUS. MARCELLUS (Marcus Claudius), a Roman commander, famous for his valour, was five times consul. He was called *The sword of the Romans*, and killed king Britomarus with his own hand. He subdued the Insubrians, and took Milan their capital; as also Syracuse, where he endeavoured to preserve Archimedes.



Margrave  
March.

medes. He fought two days with Hannibal with equal success; but was killed on the third, and his corpse treated with all imaginable respect by the conqueror. See CARTHAGE, ROME, and SICILY.

MARGRAVE, or MARGRAVE, a kind of dignity in Germany, answering to our marquis. See MARQUIS. The word is derived from the German *Marche*, or *Marcke*, which signifies a frontier; and *Graf*, count, governor; *Margraves* being originally governors of cities lying on the frontiers of a country or state.

MARCH, MARTIUS, the third month of the year, according to the common way of computing. See MONTH, and YEAR.

Among the Romans, March was the first month; and in some ecclesiastical computations, that order is still preserved; as particularly reckoning the number of years from the incarnation of our Saviour; that is, from the 25th of March.

Till the year 1564, the French reckoned the beginning of their year from Easter; so that there were two months of March in one year, one of which they called *March before Easter*, and the other *March after Easter*. When Easter fell within the month of March, the beginning of the month was in one year, and the end in another.

It was Romulus who divided the year into months; to the first of which he gave the name of his supposed father *Mars*. Ovid, however, observes, that the people of Italy had the month of March before Romulus's time; but that they placed it very differently, some making it the third, some the fourth, some the fifth, and others the tenth month of the year.

In this month it was that the Romans sacrificed to Anna Perenna; that they began their comitia; that they adjured their public farms and leases; that the mistresses served the slaves and servants at table, as the masters did in the Saturnalia; and that the vestals renewed the sacred fire.

The month of March was always under the protection of Minerva, and always consisted of 31 days.—The ancients held it an unhappy month for marriage, as well as the month of May.

MARCH, in the military art, is the moving of a body of men from one place to another. Care must be taken, in marching of troops, that they are not liable to be flanked or intercepted; for of all operations none is more difficult, because they must not only be directed in the objects they have in view, but according to the movements the enemy may have made.

Of all the mechanical parts of war, none is more essential than that of marching. It may be justly called the *key* which leads to all sublime motions and manoeuvres of an army; for they depend entirely on this point. A man can be attacked in four different ways; in the front, on both flanks, and in the rear; but he can defend himself, and annoy the enemy, only when placed with his face towards him. Hence it follows, that the general object of marching is reduced to three points only; to march forwards, and on both sides, because it is impossible to do it for any time backwards, and by that means face the enemy wherever he presents himself. The different steps to be made use of are three; slow, fast, and oblique.

The first is proper in advancing, when at a considerable distance from the enemy, and when the ground is unequal, that the line may not be broke, and a regular fire kept up without intermission. The second is chiefly necessary, when you want to anticipate the enemy in occupying some post, in passing a defile, and, above all, in attacking an intrenchment, to avoid being a long while exposed to the fire of the artillery and small arms, &c. The third step is of infinite consequence, both in the infantry and cavalry: columns may be opened and formed into lines, and, *vice versa*, lines into columns, by this kind of step, in a lesser space, and consequently in less time, than by any other method whatsoever. In coming out of a defile, you may instantly form the line without presenting the flank to the enemy. The line may be formed, though ever so near to the enemy, with safety, because you face him, and can with ease and safety protect and cover the motion of the troops, while they are coming out of the defiles, and forming. The same thing may be equally executed, when a column is to be formed in order to advance or retreat; which is a point of infinite consequence, and should be established as an axiom.

The order of march of the troops must be disposed, that each should arrive at their rendezvous, if possible, on the same day. The quarter-master-general, or his deputy, with an able engineer, should sufficiently reconnoitre the country, to obtain a perfect knowledge of it and the enemy, before he forms his routes.

Before a march, the army generally receives several days bread. The quarter-masters, camp colour-men, and pioneers, parade according to orders, and march immediately after, commanded by the quarter-master-general, or his deputy. They are to clear the roads, level the ways, make preparations for the march of the army, &c. The *general*, for instance, beats at 2, the *assembly* at 3, and the army to march in 20 minutes after. Upon beating the *general*, the village, and general officer's guards, quarter and rear-guards, join their respective corps; and the army pack up their baggage. Upon beating the *assembly*, the tents are to be struck, and sent with the baggage to the place appointed, &c.

The companies draw up in their several streets, and the rolls are called. At the time appointed, the drummers are to beat a march, and fliers play at the head of the line; upon which the companies march out from their several streets, form battalions as they advance to the head of the line, and then halt.

The several battalions will be formed into columns by the adjutant-general, and the order of march, &c. be given to the general officers who lead the columns.

The cavalry generally march by regiments or squadrons. The heavy artillery always keeps the great roads, in the centre of the columns, escorted by a strong party of infantry and cavalry. The field-pieces march with the columns.

Each soldier generally marches with 36 rounds of powder and ball, and 2 good flints; one of which is to be fixed in the cock of his firelock. The routes must be formed so that no columns cross one another on the march.

March)

**MARCHANTIA**, in botany, a genus of the order of algae, belonging to the cryptogamia class of plants. There are eight species, of which the most remarkable are, 1. The polymorpha, or great star-handed marchantia, is a native of Britain, growing on the banks of rivulets, on shady moist rocks, the sides of wells, and sometimes bogs. The leaves are about three inches long; from half an inch to an inch broad, lying flat on the ground, and adhering closely to it by numerous downy radicles, which grow out of the middle and base of the leaf on the under side. These leaves are situated on their edges, their upper surface of a dark, shining, green colour, reticulated with numerous, minute, rhomboidal, or lozenge-like scales; variously divided into obtuse lobes, and in the middle by a blackish purple vein; their under side is of a paler green, and their substance coriaceous, and nearly opaque. There are three varieties, from one of which is produced a yellow powder, showing a most curious and wonderful mechanism when examined by the microscope. The leaves have a strong aromatic smell, and acrid taste; and are recommended, in a decoction of skimmed milk, as good in the jaundice and other disorders of the liver. 2. The conica, or conic-mushroom marchantia, with warted leaves, grows on moist shady banks by the sides of rivulets. The leaves are broad, flat, about two inches long, dichotomous, obtusely lobed, and lie upon one another. Their surface is of a pale-green glossy colour, curiously tessellated with rhomboidal and hexagonal tubercles, each having a white vesicle or wart in the centre, with a puncture on its head. The leaves have a peculiar strong fragrant smell, and acrid aromatic taste. They are supposed to possess the same attenuating quality as the first, but in a higher degree. They are also recommended as an antiscorbutic, and for thinning the blood.

**MARCHE**, a province of France, bounded on the north by Berry, on the east by Avergne, on the west by Angoumois, and on the south by Limosin. It is about 55 miles in length, and 25 in breadth, and is pretty fertile in corn and wine.

**MARCHENA**, an handsome, ancient, and considerable town of Spain, in Andalusia, with the title of a duchy, and a suburb as large as the town, situated in the middle of a plain, particularly fertile in olives, tho' very destitute of water. W. Long. 5. 20. N. Lat. 37. 20.

**MARCHERS**, or **LORDS-MARCHERS**, were those noblemen that lived on the marches of Wales or Scotland; who, in times past, according to Camden, had their laws, and *politiam vite*, &c. like petty kings, which are abolished by the stat. 27 H. 8. c. 26. and 1 Edw. 6. c. 10. In old records the lords marches of Wales were styled *Marchianes de Marchia Wallie*. See 1 & 2 P. & M. c. 15.

**MARCHES**, (*marchia*.) from the German *march*, i. e. *limes*, or from the French *marque*, viz. *signum*, (being the notorious distinction between two countries or territories), are the limits between England and Wales, or between England and Scotland, which last are divided into west and middle marches, 4 Hen. 5. c. 7. 22 Ed. 4. c. 8. 24 Hen. 8. c. 9. And there was formerly a court called the *court of the marches of Wales*, where pleas of debt or damages, not above

the value of 50 pounds, were tried and determined; and if the council of the marches held plea for debts above that sum, &c. a prohibition might be awarded. Hill. 14. Car. 1. Cro. Car. 384.

**MARCION**, an heresiarch, born at Sinope in Paphlagonia, or Pontus, in the second century. In his younger years he followed the stoic philosophy, and loved solitude and poverty; but being convicted of uncleanness with a virgin, he was expelled the church by his father, who was bishop. Afterwards he came to Rome, where he invented his heresies. His doctrines were, many of them, the same that were afterwards adopted by the Manichæans; as, for instance, that there two coeternal independent principles, one the author of all good, the other the author of all evil. Marcion meeting St Polycarpus in the streets of Rome, asked him, whether he knew him? "Very well, (answered the bishop), I know you to be the devil's eldest son." Tertullian relates, that Marcion, repenting of his errors, would have abjured them publicly, provided he might have been again admitted into the church; which was agreed to, on condition he would bring back all those he had seduced from it: but before he could effect this task, he died.

**MARCIONITES**. See **MARCION**.

**MARCOMANNI**, an ancient people of Germany, who seem to have taken their name from their situation on the limits or marches, to the east of the Higher Rhine, and the north of the Danube. Cluverius allots to them the duchy of Wurtemberg, a part of the palatinate between the Rhine and the Neckar, the Brisgau, and a part of Suabia, lying between the springs of the Danube and the river Bregenz: they afterwards removed to the country of the Boii, whom they expelled and forced to withdraw more to the east, occupying what is now called *Bohemia*. (Strabo, Velicius.)

**MARCOSIANS**, a set of Christian heretics of the second century, so called from their leader Marcus, who represented the supreme God as consisting not of a Trinity, but a Quaternity; viz. the Ineffable, Silence, the Father, and Truth.

**MARCUS** (Aurelius Antoninus). See **ANTONINUS**.

**MARDIKERS**, or **TOPASSES**, a mixed breed of Dutch, Portuguese, Indians, and other nations, incorporated with the Dutch at Batavia, in the East Indies.

**MARE**, the female of the horse kind. See the article *Equus*.

Before a mare is covered, she should be in the house about six weeks, during which time she should be well fed with good hay and oats well sifted; and in order to render her conception the more certain, near a quart of blood may be taken from each side of her neck, about five or six days before covering. Another method to bring a mare in season and make her retain, is to give her, for the space of eight days before you bring her to the horse, about two quarts of hemp-feed in the morning, and as much at night; and if she refuses to eat it, to mingle it with a little bran or oats, or else to let her fast for a while: and if the stallion also eat of it, it will greatly contribute to generation.

Mares go with foal 11 months, and as many days.

Marets.

as they are years old; and therefore the properest time for covering them is in the beginning of June, that they may foal the May following, when there will be plenty of grass, which will afford the mares a great abundance of milk for nourishing their foals. After covering, let her, for three weeks or a month, have the same diet as before, and be kept clean in the stable till the middle of May, with her feet well pared and thin shod; take her in again about the latter end of September, if not before, and keep her to the end of her foaling. If she cannot readily bring forth, hold her nostrils for as to stop her taking wind; and if that will not do, dissolve madder, to the quantity of a walnut, in a pint of ale, and give it her warm. In case she cannot void her scudine, or after-burden, boil two or three handfuls of fennel in running water; then put half a pint of that liquor into as much sack, or, for want thereof, into a pint of ale, with a fourth part of salad-oil, mixed together, and pour it lukewarm into her nostrils, holding them close for some time. Otherwise, give her green wheat, or rye, the last of which is best.

If the mare has but little milk, boil as much as you can get from her, with the leaves of lavender and spike, and bathe the udder with it warm, till the knobs and knots are dissolved. She should now drink only white water, which is bran put into water; give her also sweet mashes: and a month after foaling, let her have a mash with some brimstone or safin in it.

MARETS (Jean de), a Parisian, one of the finest geniuses of the 17th century, became at last a visionary and a fanatic. He was a great favourite of cardinal Richlieu, and possessed an employment of genius under him; for he was called upon to relax and divert him, after the fatigue of business, by facetious conversation. He used, in order to triumph over the virtue of women, when they objected to him the interest of their salvation, to lead them into atheistical principles. He was a member of the French academy from its first erection. He wrote several dramatic pieces, which were well received. He attempted an epic poem; but after spending several years about it, dropped the design, to write books of devotion. He likewise wrote romances; but not such virtuous ones as used to be wrote at that time. He was a declared enemy of the Jansenists. His visions are well described by the Messieurs de Port Royal. He promised the king of France, by the explication of prophecies, the honour of overthrowing the Mahometan empire. In his last years he wrote something against Boileau's Satires.

MARETS (Samuel de), one of the most celebrated divines of the reformed church, was born in Picardy, in 1599. In 1620, he was settled in the church of Laon; but, in 1624, accepted a call to that of Sedan; in 1642, he obtained a professorship at Groningen; and, from that time to his death, exerted himself so much in the service of that university, that it was reckoned one of the most flourishing in the Netherlands. His System of Divinity was found to be so methodical, that it was made use of at other academies; and at the end of it may be found a chronological table of all his works. Their number is prodigious; and their variety shows the extent of his genius. He was more-or-less engaged in many disputes and controversies, and

died in 1673.

MARGARET (countess of Richmond and Derby), the learned and pious mother of Henry VII. was born at Bethoe in Bedfordshire, in 1441; and was the sole heiress of John Beaufort, duke of Somerset, grandson to John of Gaunt. Her mother was the heiress of lord Beauchamp of Powick. Whilst yet very young, the great duke of Suffolk, minister to Henry VI. or rather to queen Margaret, sought her in marriage to his son; and she was at the same time solicited by the king for his half-brother Edmund, earl of Richmond. To the latter she gave her hand. Henry VII. was the sole fruit of this marriage, his father dying when he was but 15 weeks old. Her second husband was Sir Henry Stafford, knight, second son to the duke of Buckingham; by whom she had no issue. Soon after his death, which happened in the year 1482, she sought consolation in a third husband, Thomas lord Stanley, who, in the first year of her son's reign, was created earl of Derby. He died in the year 1504, without issue, being then high constable of England. She survived her lord not quite five years, dying at Westminster in June 1509, in the 69th year of her age. She was buried in Henry VII.'s chapel, on the south-side of which was erected to her memory an altar-tomb of black marble, with her statue of brass.

From her funeral sermon preached by her confessor bishop Fisher, who, says Ballard, knew the very secrets of her soul, we learn, "that she possessed almost all things that were commendable in a woman, either in mind or body." She understood the French language perfectly, and had some knowledge of the Latin. She was devout even to austerity, in humility romantic, profuse in the encouragement of learning, and singularly chaste; but this last virtue became conspicuous only towards the latter end of a third marriage. "In her last husband's days (says Baker), she obtained a licence of him to live chaste, whereupon she took upon her the vow of celibacy." "A boon, (says Mr Walpole), as seldom requested, I believe, of a third husband, as it probably would be easily granted." Her life, from the turbulence of the times, and vicissitude of her son's fortune, must necessarily have been subject to infinite disquiet, which however she is said to have supported with singular fortitude.—She wrote, 1. The mirroure of golde for the sinful soule, translated from a French translation of a book called *Speculum aureum peccatorum*. Emprynted at London, in Flete-stre, at the signe of St George, by Richard Pynson, quarto, with cuts on vellum. 2. Translation of the fourth book of Dr Gerfen's treatise of the imitation and following the blessed life of our most merciful Saviour Christ. Printed at the end of Dr Wm. Atkinson's English translation of the three first books, 1504. 3. A letter to the king; in Howard's collection. 4. By her son's order and authority, she also made the Orders for great estates of ladies and noble women, for their precedence, and wearing of barbes at funerals, over the chin and under the same.

MARGARET, the daughter of Woldemar III. king of Denmark, styled the *Semiramis of the North*: she succeeded her father in the throne of Denmark, her husband in that of Norway, and the crown of Sweden was given her as a recompence for delivering the Swedes from the tyranny of Albert their king. Thus pos-

Margaret.



Margaret  
Maria.

possessed of the three kingdoms, she formed the grand political design of a perpetual union, which she accomplished, *pro tempore* only, by the famous treaty styled the *union of Colmar*. She died in 1412, aged 59.

MARGARET of Anjou, daughter of René D'Anjou, king of Naples, and wife of Henry VI. king of England; an ambitious, enterprising, courageous woman. Intrepid in the field, she signalized herself by heading her troops in several battles against the house of York; and if she had not been the authoress of her husband's misfortunes, by putting to death the duke of Gloucester his uncle, her name would have been immortalized for the fortitude, activity, and policy with which she supported the rights of her husband and son, till the fatal defeat at Tewksbury; which put an end to all her enterprises, the king being taken prisoner, and prince Edward their only son basely murdered by Richard duke of York. Margaret was ransomed by her father, and died in Anjou in 1482. See ENGLAND, n° 190,—198.

MARGARITA, or PEARL-ISLAND, an island of South America, the middle of which is seated in W. Long. 64. 2. N. Lat. 11. 30. It was discovered by Columbus, and is about 35 leagues in compass. The soil is very fertile in maize and fruits, and abounds in pasture and verdant groves; yet is totally destitute of fresh water, which the inhabitants are obliged to bring from the continent. When the Spaniards first landed here, they found the natives busy in fishing for oysters. Columbus ordered some of the savages aboard his ship, who were so far from being terrified, that they very soon became familiar with the Spaniards. The latter at first imagined that the oysters served them for food; but on opening the shells, they found they contained valuable pearls. Upon this discovery they immediately landed, and found the natives ready to part with their pearls for the merest trifles. In process of time the Spaniards built a castle, called *Monpadre*, and employed prodigious numbers of Guinea and Angola Negroes in the pearl-fishery; cruelly forcing them to tear up the oysters from the rocks to which they stuck, during which time many of them were destroyed by the sharks and other voracious fishes. In 1620, this island was invaded by the Dutch, who demolished the castle upon it: since which time it has been in a manner abandoned by the Spaniards; and is now principally inhabited by the natives, to whom some particular indulgences were granted by the court of Spain, on account of their ready submission to Columbus.

MARGARITA, the PEARL, in natural history. See PEARL, and MYA.

MARGATE, a sea-port town of Kent, in the isle of Thanet, much frequented in the summer-time for bathing in the salt-water. E. Long. 1. 30. N. Lat. 51. 24.

MARIA, or SANCTA MARIA, an island of the Indian Ocean, lying about five miles east from Madagascar. It is about 27 miles long, and five broad; well watered, and surrounded by rocks. The air is extremely moist, for it rains almost every day. It is inhabited by 500 or 600 negroes, but seldom visited by ships.

MARIA (St.), a considerable town of South America, in the audience of Panama, built by the Spaniards

after they had discovered the gold mines near it, and soon after taken by the English. It is seated at the bottom of the Gulf of St Michael, at the mouth of a river of the same name; which is navigable, and the largest that falls into the gulf. The Spaniards come here every year in the dry season, which continues three months, to gather the gold-dust out of the sands of the neighbouring streams; and carry away great quantities. W. Long. 148. 30. N. Lat. 7. 0.

MARIA (St.), a handsome and considerable town of Spain, in Andalusia, with a small castle. It was taken by the English and Dutch in 1702, for the archduke of Austria. It is seated on the Guadaleta, at the mouth of which is a tower and a close battery. W. Long. 5. 33. N. Lat. 36. 35.

MARIAN ISLANDS. See LADRONE ISLANDS.

MARIANA (John), a learned Spanish historian, born at Talavera in the diocese of Toledo. He entered among the Jesuits in 1554, at 17 years of age; and became one of the most learned men of his time. He was a great divine, a good humanist, and profoundly versed in ecclesiastical as well as profane history. He taught at Rome, in Sicily, at Paris, and in Spain; and died at Toledo in 1624. His principal works are, 1. An excellent history of Spain in 30 books; which he himself translated from the Latin into Spanish, without servilely following his own Latin edition. 2. *Scholia*, or short notes on the bible. 3. A treatise on the changes the species has undergone in Spain; for which he was thrown into prison by the duke of Lerma, the Spanish minister. 4. A famous treatise *De rege et regis institutione*, which made much noise, and was condemned by the parliament of Paris to be burnt by the hands of the common hangman, for his asserting in that work, that it is lawful to murder tyrants. 5. A work on the faults of the government of the society of Jesuits, which has been translated into Spanish, Latin, Italian, and French, &c.

MARIANUS scorvus, an Irish monk, was related to the Venerable Bede, and wrote a chronicle which is esteemed. He died in the abbey of Fuld, in 1086, aged 58.

MARIGALANTE, an island of North America, and one of the least of the Caribbees. It was discovered by Christopher Columbus in 1493; the French settled here in 1648; and it was taken by the English in 1691, but the French soon got possession of it again. The land is proper for sugar-canes, indigo, tobacco, and cotton; but sometimes they are in great want of water. W. Long. 60. 51. N. Lat. 16. 32.

MARINE, a general name for the navy of a kingdom or state; as also the whole œconomy of naval affairs; or whatever respects the building, rigging, arming, equipping, navigating, and fighting ships. It comprehends also the government of naval armaments, and the state of all the persons employed therein, whether civil or military.

The history of the marine affairs of any one state is a very comprehensive subject, much more than that of all nations. Those who would be informed of the maritime affairs of Great Britain, and the figure it has made at sea in all ages, may find abundance of curious matter in Selden's *Mare Clausum*; and from his time to ours, we may trace a series of facts in Lediard's and Burchet's Naval History, but above all in the Lives

Maria  
Marine.

Marines  
&  
Mariner.

of the Admirals, by the accurate and judicious Dr Campbell.

**MARINES**, or *MARINE Forces*, a body of soldiers raised for the sea-service, and trained to fight either in a naval engagement, or in an action ashore.

The great service of this useful corps was manifested frequently in the course of the late war, particularly at the siege of Belleisle, where they acquired a great character, although lately raised and hardly exercised in military discipline. At sea they are incorporated with the ship's crew, of which they make a part; and many of them learn in a short time to be excellent seamen, to which their officers are ordered by the admiralty to encourage them, although no sea-officer is to order them to go aloft against their inclination. In a sea-fight their small-arms are of very great advantage in scouring the decks of the enemy; and when they have been long enough at sea to stand firm when the ship rocks, they must be infinitely preferable to seamen if the enemy attempts to board, by raising a battalion with their fixed bayonets to oppose him.

The marine forces of Great Britain in the time of peace are stationed in three divisions; one of which is quartered at Chatham, one at Portsmouth, and another at Plymouth. By a late regulation, they are ordered to do duty at the several dock-yards of those ports, to prevent embezzlement of the king's stores, for which a captain's guard mounts every day; which certainly requires great vigilance, as so many abuses of this kind have been committed, that many of the inhabitants, who have been long used to an infamous traffic of this kind, expect these conveyances at certain periods as their due, and of course resent this regulation in the highest degree as an infringement of their liberties as British subjects.

**MARINE Discipline**, is the training up soldiers for sea-service, in such exercises as the various positions of the firelock and body, and teaching them every manœuvre that can be performed on board ships of war at sea. See **EXERCISE**.

**MARINE Chair**, a machine invented by Mr Irwin, for viewing the satellites of Jupiter at sea, and of course determining the longitude by their eclipses. An account of it is given in the *Journal Estranger* for March 1760. An account of its accuracy was published the year following, by M. de L'Isle astronomer in the imperial academy of Peterburg: but notwithstanding the encomiums bestowed upon it by this gentleman, it hath never come into general use; and therefore we may conclude, that it is much inferior to the inventions of Mr Harrison for the same purpose. See **HARRISON** and **NAVIGATION**.

**MARINER**, the same with a sailor or seaman. See these articles.

*Method of Preserving the Health of MARINERS*. See **SEAMEN**.

**MARINER'S Compass**. See **COMPASS**.

The invention of the compass is usually ascribed to Flavio da Melis, or Flavio Gioia, a Neapolitan, about the year 1302; and hence it is, that the territory of Principato, which makes part of the kingdom of Naples, where he was born, has a compass for its arms. Others say that Marcus Paulus, a Venetian, making a journey to China, brought back the invention with him in 1260. What confirms this conjecture is, that

at first they used the compass in the same manner as the Chinese still do; *i. e.* they let it float on a little piece of cork, instead of suspending it on a pivot. It is added, that their emperor Chingus, a celebrated astrologer, had a knowledge of it 1120 years before Christ. The Chinese only divide their compass into 24 points. Fauchette relates some verses of Guyot de Provence, who lived in France about the year 1200, which seem to make mention of the compass under the name of *marinette*, or *mariner's stone*; which shew it to have been used in France near 100 years before either the Melisite or Venetian. The French even lay claim to the invention, from the *fleur de lys* wherewith all nations still distinguish the north point of the card. With as much reason Dr Wallis ascribes it to the English, from its name *compass*, by which name most nations call it, and which he observes is used in many parts of England to signify a circle.

The compass hath sometimes been observed to be disturbed by the electricity of its glass-cover; and this from so slight an application of the finger as was barely necessary to wipe off a little dust. The same glass, rubbed a little more with the finger, a bit of muslin, or paper, would attract either end of the needle, so as to hold it to the glass for several minutes, far out of the due direction, according to that part of the glass which was most excited. And when the needle, after adhering to the glass, has dropped loose, and made vibrations, those would not be bisected as usual by that point where the needle should rest, but would either be made all on one side, or be very unequally divided, by means of some remains of electrical virtue in that part of the glass which had attracted the needle, until at length, after 15 minutes or more, all the electricity being discharged, the magnetical power took place. The remedy for this inconvenience is to moisten the surface of the glass: a wet finger will do it immediately and effectually. The mariner's compass with a chart is much less dangerously moved than the common compass with a bare needle: and the deeper, or farther distant, the needle hangs below the glass, the less disturbance it is likely to receive.

**ST MARINO**, a small town and republic of Italy, situated in E. Long. 13. 44. N. Lat. 44. 21. This small republic consists only of a mountain, and a few hillocks, that lie scattered about the bottom of it. The number of the inhabitants is about 5000. The mountain yields good wine, but they have no other than rain or snow water. The founder of the republic was a Dalmatian, and a mason, who upwards of 1300 years ago turned hermit, and retired to this mountain. Here his devotion and austerities, and, in consequence of that, his reputation for sanctity, were such, that the princeps of the country made him a present of the mountain, on which many, out of veneration for the saint, soon after took up their abode. Thus was the foundation laid of the town and republic, which still bears the name of the saint. The town stands on the top of the mountain, and there is only one way by which it can be come at. In the whole territory are only three castles, three convents, and five churches. The largest of the churches is dedicated to the saint, and contains his ashes and his statue. He is looked upon as the greatest saint, next to the blessed Virgin; and to speak disrespectfully of him is accounted blasphemy, and punished

Mariner,  
Marino.

nished as such. The republic is under the protection of the pope. All that are capable of bearing arms are exercised, and ready at a minute's call. In the ordinary course of government, the administration is in the hands of the council of 60, which, notwithstanding its name, consists only of 40; one half of the members of which are of the noble families, and the other of the plebeian: on extraordinary occasions, however, the *arengo*, in which every house has its representative, is called together. The two principal officers are the capitaneos, who are chosen every half year; and next to them is the commissary, who judges in civil and criminal matters, and is joined in commission with the capitaneos; both he and the physician must be foreigners, and both have their salaries out of the public stock. When any person, after due summons, neglects to assist at the council according to their statute-book, he is to be fined in about a penny English; and when an ambassador is to be sent to any foreign state, he is to be allowed about 1s. a-day.

MARINO (John Baptist), a celebrated Italian poet, born at Naples in 1569. His father, who was an able civilian, obliged him to study the law; at which being disgusted, he left his parents, and retired to the house of the Sieur Manzi, who was a friend to all persons of wit. He at length became secretary to Matthew of Capua, great admiral of the kingdom of Naples, and contracted a friendship with Tasso. A short time after, he went to Rome, and entered into the service of cardinal Aldobrandini, nephew to pope Clement VIII. who took him with him to Savoy. Marino was in great favour with the court of Turin; but afterwards created himself many enemies there, the most furious of whom was the poet Gaspard Murtola, who, attempting to shoot him with a pistol, wounded one of the duke of Savoy's favourites. Marino being obliged to leave Turin, went to Paris at the desire of queen Mary de Medicis, and published there his poem on Adonis. He afterwards went to Rome, where he was made prince of the academy of the *humoristi*; from thence to Naples, where he died while he was preparing to return home. He had a very lively imagination, but little judgment; and, giving way to the points and conceits then in vogue, his authority, far from correcting the false taste of the Italians, served rather to keep it farther from reformation. His works, which are numerous, have been often printed.

MARIOTTE (Edme), an eminent physician and mathematician, was born in Burgundy, and was made a member of the academy of sciences. He died in 1684. His works, which are much esteemed, were printed at Leyden in 1717, 2 vols. 4to.

MARJORAM, in botany. See ORIGANUM.

MARTAGIUM, that portion which is given with a daughter in marriage.

MARITAGIUM, or Marriage, strictly taken, is that right which the lord of the fee had, to marry the daughters of his vassals after their death: Others tell us, it was that profit which might accrue to the lord, by the marriage of one under age, who held his lands of him by knight's service.

MARITIME, something relating to, or bounded by the sea. Thus a maritime province, or country, is one bounded by the sea; and a maritime kingdom is one that makes a considerable figure, or that is very

powerful at sea. Hence, by *maritime* powers among the European states, are understood Great Britain and Holland.

MARITIME State, in British polity, one of the three general divisions of the laity: (See LAITY.) This state is nearly connected with the military; though much more agreeable to the principles of our free constitution. The royal navy of England hath ever been its greatest defence and ornament; it is its ancient and natural strength; the floating bulwark of the island; an army, from which, however strong and powerful, no danger can ever be apprehended to liberty; and accordingly it has been assiduously cultivated from the earliest ages. To so much perfection was our naval reputation arrived in the 12th century, that the code of maritime laws, which are called the *laws of Oleron*, and are received by all nations in Europe as the ground and substruction of all their maritime constitutions, was confessedly compiled by our king Richard I. at the isle of Oleron on the coast of France, then part of the possessions of the crown of England. And yet, so vastly inferior were our ancestors in this point to the present age, that even in the maritime reign of queen Elizabeth, Sir Edward Coke thinks it matter of boast, that the royal navy of England then consisted of *three and thirty* ships. The present condition of our marine is in great measure owing to the salutary provisions of the statutes called the *navigation acts*; whereby the constant increase of English shipping and seamen was not only encouraged, but rendered unavoidably necessary. By the statute 5 Ric. II. c. 3. in order to augment the navy of England, then greatly diminished, it was ordained, that none of the king's liege people should ship any merchandise out of or into the realm, but only in ships of the king's licence, on pain of forfeiture. In the next year, by statute 6 Ric. II. c. 8. this wise provision was enervated, by only obliging the merchants to give English ships (if able and sufficient) the preference. But the most beneficial statute for the trade and commerce of these kingdoms is that navigation-act, the rudiments of which were first framed in 1650, with a narrow partial view; being intended to mortify our own sugar-islands, which were disaffected to the parliament, and still held out for Charles II. by stopping the gainful trade which they then carried on with the Dutch, and at the same time to clip the wings of those our opulent and aspiring neighbours. This prohibited all ships of foreign nations from trading with any English plantations, without license from the council of state. In 1651, the prohibition was extended also to the mother-country: and no goods were suffered to be imported into England, or any of its dependencies, in any other than English bottoms; or in the ships of that European nation, of which the merchandise imported was the genuine growth or manufacture. At the Restoration, the former provisions were continued, by stat. 12 Car. II. c. 18. with this very material improvement, that the master and three-fourths of the mariners shall also be English subjects.

Many laws have been made for the supply of the royal navy with seamen; for their regulation when on board; and to confer privileges and rewards on them during and after their service.



1. For their supply. The principal, but the most odious, though often necessary method for this purpose, is by impressing; see IMPRESSING. But there are other ways that tend to the increase of seamen, and manning the royal navy. Parishes may bind out poor boys apprentices to the masters of merchantmen, who shall be protected from impressing for the first three years; and if they are impressed afterwards, the masters shall be allowed their wages: great advantages in point of wages are given to volunteer seamen, in order to induce them to enter into his majesty's service: and every foreign seaman, who, during a war, shall serve two years in any man of war, merchantman, or privateer, is naturalized *ipso facto*. About the middle of king William's reign, a scheme was set on foot for a register of seamen to the number of 30,000, for a constant and regular supply of the king's fleet; with great privileges to the registered men, and, on the other hand, heavy penalties in case of their non-appearance when called for: but this registry, being judged to be rather a badge of slavery, was abolished by stat. 9 Ann. c. 21.

2. The method of ordering seamen in the royal fleet, and keeping up a regular discipline there, is directed by certain express rules, articles, and orders, first enacted by the authority of parliament soon after the Restoration; but since new-modelled and altered, after the peace of Aix-la-Chapelle, to remedy some defects which were of fatal consequence in conducting the preceding war. In these articles of the navy almost every possible offence is set down, and the punishment thereof annexed: in which respect the seamen have much the advantage over their brethren in the land-service; whose articles of war are not enacted by parliament, but framed from time to time at the pleasure of the crown. Yet from whence this distinction arose, and why the executive power, which is limited so properly with regard to the navy, should be so extensive with regard to the army, it is hard to assign a reason; unless it proceeded from the perpetual establishment of the navy, which rendered a permanent law for their regulation expedient, and the temporary duration of the army, which subsisted only from year to year, and might therefore with less danger be subjected to discretionary government. But, whatever was apprehended at the first formation of the mutiny-acts, the regular renewal of our standing force at the entrance of every year has made this distinction idle. For, if from experience past, we may judge of future events, the army is now lastingly ingrafted into the British constitution; with this singularly fortunate circumstance, that any branch of the legislature may annually put an end to its legal existence, by refusing to concur in its continuance.

3. With regard to the privileges conferred on sailors, they are pretty much the same with those conferred on soldiers; with regard to relief, when maimed, or wounded, or superannuated, either by county-rates, or the royal hospital at Greenwich; with regard also to the exercise of trades, and the power of making nuncupative testaments: and, farther, no seaman aboard his majesty's ships can be arrested for any debt, unless the same be sworn to amount to at least twenty pounds; though, by the annual mutiny-acts, a soldier may be arrested for a

debt which extends to half that value, but not to a less amount.

MARIUS, the Roman general, and seven times consul, who fulfilled his great military reputation by savage barbarities, died about 86 B. C.

St MARK the Evangelist's Day, a festival of the Christian church, observed April 25.

St Mark was by birth a Jew, and descended of the tribe of Levi. He was converted by some of the apostles, probably by St Peter; to whom he was a constant companion in all his travels, supplying the place of an amanuensis and interpreter. He was by St Peter sent into Egypt, fixing his chief residence at Alexandria, and the places thereabout: where he was so successful in his ministry, that he converted multitudes both of men and women. He afterwards removed westward, towards the parts of Libya, going through the countries of Marmarica, Pentapolis, and others thereabouts; where, notwithstanding the barbarity and idolatry of the inhabitants, he planted the gospel. Upon his return to Alexandria, he ordered the affairs of that church, and there suffered martyrdom in the following manner. About Easter, at the time the solemnities of Serapis were celebrated, the idolatrous people, being excited to vindicate the honour of their deity, broke in upon St Mark, while he was performing divine service, and, binding him with cords, dragged him through the streets, and thrust him into prison, where in the night he had the comfort of a divine vision. Next day, the enraged multitude used him in the same manner, till, his spirits failing, he expired under their hands. Some add, that they burnt his body, and that the Christians decently interred his bones and ashes near the place where he used to preached. This happened in the year of Christ 68.

Some writers assert, that the remains of St Mark were afterwards, with great pomp, translated from Alexandria to Venice. However, he is the tutelar saint and patron of that republic, and has a very rich and stately church erected to his memory.

Some have confounded this evangelist with John Mark so often spoken of in the Acts of the Apostles: but this opinion is now generally given up. This apostle is author of one of the four gospels inscribed with his name. See the following article.

St MARK's Gospel, a canonical book of the New Testament, being one of the four gospels.

St Mark wrote his gospel at Rome, where he accompanied St Peter in the year of Christ 44. Tertullian and others pretend, that St Mark was no more than an amanuensis to St Peter, who dictated this gospel to him; others affirm, that he wrote it after St Peter's death. Nor are the learned less divided as to the language it was wrote in; some affirming it was composed in Greek, others in Latin. Several of the ancient heretics received only the gospel of St Mark: others, among the Catholics, rejected the 12 last verses of this gospel. The gospel of St Mark is properly an abridgement of that of St Matthew.

Canons of St MARK, a congregation of regular canons, founded at Mantua, by Albert Spinola a priest, towards the end of the 12th century. Spinola made a rule for them, which was approved, corrected, and confirmed by several succeeding popes. About the year

Mark  
Marlborough.

year 1450, they were reformed, and followed only the rule of St Augustine. This congregation having flourished by the space of 400 years, declined by little and little, and is now become extinct.

*Knights of St MARK*, an order of knighthood in the republic of Venice, under the protection of St Mark the evangelist. The arms of the order are, a lion winged or; with this device, PAX TIBI MARCE EVANGELISTA. This order is never conferred but on those who have done signal service to the commonwealth.

MARK, or *Marc*, also denotes a weight used in several states of Europe, and for several commodities, especially gold and silver. In France, the mark is divided into eight ounces, 64 drachms, 192 deniers or penny-weights, 160 esterlins, 300 mailles, 640 felins, or 4608 grains. In Holland, the mark weight is also called *Troy weight*, and is equal to that of France. When gold and silver are sold by the mark, it is divided into 25 carats.

MARK, is also used among us for a money of account, and in some other countries for a coin. See MONEY-Table.

The English mark is two thirds of a pound Sterling, or 12 s. 4 d. and the Scotch mark is of equal value in Scots money of account, viz. 13  $\frac{1}{2}$  d.

MARKET, a public place in a city or town, in which live-cattle, provisions, or other goods, are set to sale; and also a privilege, either by grant or prescription, by which a town is enabled to keep a market.

MARKHAM (Gervase), an English author, was the son of Robert Markham of Gotham, esq; in Nottinghamshire, and bore a captain's commission under Charles I. in the civil wars. He was esteemed both a good soldier and a good scholar. He was particularly master of the French, Italian, and Spanish. He wrote, 1. The tragedy of Herod and Antipater, which was printed in 1622. 2. Many volumes upon husbandry and horsemanship. 3. A piece on the art of fowling. 4. The soldiers accident and grammar.

MARKLAND (Jeremiah,) one of the most learned scholars and penetrating critics of the age, was born in 1692, and received his education in Christ's hospital. He became first publicly known by his "*Epistola Critica*," addressed to bishop Hare. In this he gave many proofs of extensive erudition and critical sagacity. He afterwards published an edition of Statius, and some plays of Euripides; and assisted Dr Taylor in his editions of *Lyfias* and *Demothenes*, by the notes which he communicated to him. He has also very happily elucidated some passages in the New Testament, which may be found in Mr Bowyer's edition of it; and was author of a very valuable volume of remarks on the epistles of Cicero to Brutus, and of an excellent little treatise under the title of *Quaestio Grammatica*. He died in 1775, at Milton, near Dorking in Surry; and was a man not more valued for his universal reading, than beloved for the excellency of his heart and primitive simplicity of manners.

MARLBOROUGH, a town of Wiltshire in England, so called, as some think, from its chalky soil. It is an ancient borough by prescription, and sends two members to parliament. It has suffered greatly by

fire; particularly, in 1728, there was such a conflagration, that, if the street had not been very broad, the whole town would probably have been burnt down.

MARLBOROUGH (duke of). See CHURCHILL.

MARLBOROUGH-FORT, an English factory on the west coast of the island of Sumatra in Asia; seated three miles west of the town of Bencoolen. E. Long. 101. 12. S. Lat. 4. 21.

MARLE, a kind of calcareous earth, very much used in agriculture as a manure. See AGRICULTURE, n<sup>o</sup> 169, 170.

Marle is dug in many places of Great Britain and Ireland. In digging for it in Ireland, they meet with horns and other curious fossils. The marle always lies in the bottoms of low bogs, and is found by boring with augres made for that purpose. It usually lies at five, seven, or nine feet depth. The obtaining it in many places is attended with very considerable expenses in draining off the water. The manner of digging it is this: They employ six able labourers and a supernumerary; and these cut up a hole of 12 feet square, which is suppoed a pit that this number of men can manage in one day. Two men dig, two throw it up, and two throw it by, and the supernumerary man supplies defects on all occasions. For the first three feet they dig through a fuzzy earth, fit for making of turf or fuel. Under this lies a stratum of gravel, of about half a foot: under this often, for three feet more, there is a more kindly moss, which would make better fuel. This lower stratum is always full of fossil wood, which is usually so soft, that the spade cuts as easily through it as through the earth it lies in. Under this, for the thickness of about three inches, is found a series of leaves, principally of the oak. These appear very fair to the eye, but fall to pieces on being touched; and this stratum is sometimes interrupted by vast heaps of feed, which seem to be broom or furze feed. In some places there appear berries of different kinds, and in others several species of sea-plants; all lying in the same confused manner as the oak-leaves. Under this vegetable stratum there lies one of blue clay, half a foot thick, and usually full of sea-shells. This blue clay is not so tough as common clay; but is thrown carefully up, and used as marle in some places. Under this always appears the true marle; the stratum of which is usually from two to four feet thick, and sometimes much more.—This marle looks like buried lime, and is full of shells; which are usually of a small size, and of the periwinkle kind; but there are several other sorts at times found among them. Among this marle, and often at the very bottom of it, are found great numbers of very large horns of the deer kind, which are vulgarly called *elk's horns*. These, where they join to the head, are thick and round; and at that joining there grows out a branch, which is about a foot long, and seems to have hung just over the creature's eyes: it grows still round for about a foot above this; and then spreads out broad, and terminates in branches long and round, terminating with a small bend. The labourers are obliged to work in a hurry in all these pits, so that they seldom bring out the horns whole. There are also, at times, found the leg-bones and other parts of the skeletons of the same beasts; but this more rarely, only a few

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Marle.

few together, and but in places.

Dr Black is of opinion, that all kinds of marle derive their origin from the calcareous matter of shells and lithophyta.

Shell-marle, says he, is composed of the shells of aquatic animals, which are sometimes very entire, and often decayed or mixed down with other earthy substances. Examining this matter as occurring in different places, it may be distinguished into fresh-water marle, and the marle of sea-shells. Of the first we have an example in the Meadow at Edinburgh. Wherever the soil is turned up to the depth of six inches, a quantity appears. It is composed of the shells of a small fresh-water snail or welk. This animal, when alive, is not easily discernible, the shell being much of the same obscure colour as the stones covered with the water. But we can observe a great number of them in all running brooks and other collections of fresh water; and as the animal dies the shells are deposited where the water stagnates in very great quantity. That composed of sea shells, constitutes greater collections that are found in innumerable places now far removed from the sea. That most particularly described by Reaumur is a collection of this kind in a province of France, and at Turin. That part of the country where it is found is computed to contain 80 square miles of surface; and wherever they dig to a certain depth, they find this collection of shells: the country at present is 108 miles from the sea. They find the marle eight or nine feet below the surface, and they dig it to the depth of 20 feet. It is still deeper, but they find it too expensive to search for it. He supposes it to be only 18 feet deep; and even at this depth the quantity will appear enormous. It will amount to 140 millions of cubic fathoms of shells that are mostly decayed and broken into fragments, and mixed with other marine productions, as millipores, madripores, and other coralline bodies, which are all productions of the sea.

MARLIN, in sea-affairs, are tarred white skains, or long wreaths or lines of untwisted hemp, dipped in pitch or tar, with which cables and other ropes are wrapped round, to prevent their fretting or rubbing in the blocks or pulleys through which they pass. The same serves in artillery upon ropes used for rigging gins, usually put up in small parcels called *skains*.

MARLOE (Christopher), an English dramatic author, was a student in the university of Cambridge; but afterwards turning player, he rode the same stage with the inimitable Shakespear. He was accounted an excellent poet even by Ben Johnson himself. He wrote six tragedies, one of which called *Luff's Dominion*, or the *Lascivious Queen*, has been altered by Mrs Behn, and acted under the title of *Abdelazar*, or the *Moor's Revenge*. Some time before his death, he had made a considerable progress in an excellent poem entitled *Hero and Leander*; which was afterwards finished by George Chapman, who is said to have fallen short of the spirit and invention discovered by Marloe. Mr Anthony Wood represents him as a free-thinker, in the worst sense of the word; and gives the following account of his death. Falling deeply in love with a low girl, and having for his rival a fellow in livery, Marloe, imagining that his

mistress granted him favours, was fired with jealousy, and rushed upon him in order to stab him with his dagger: but the footman avoided the stroke, and, seizing his wrist, stabbed him with his own weapon; of which wound he died, in the year 1593.

MARLOW, a town of Buckinghamshire, in England, seated on the river Thames, over which there is a bridge into Berkshire. It sends two members to parliament. W. Long. o. 45. N. Lat. 51. 34.

MARLY, a palace belonging to the king of France, between Versailles and St Germain; seated in a valley, near a village and forest of the same name. It is noted for its fine gardens and water-works, there being a curious machine on the river Seine, which not only supplies them with water, but also those of Versailles. It is 10 miles N.W. of Paris. E. Long. 2. 11. N. Lat. 48. 52.

MRMANDE, a town of France, in Guienne, and in Agennois. It carries on a great trade in corn and wine, and is seated on the river Garonne, in E. Long. o. 15. N. Lat. 38. 35.

MARMALADE, a confection of plums, apricots, quinces, &c. boiled up to a consistence with sugar.

MARMOR. See MARBLE.

MARMORA, the name of four islands of Asia, in the sea of the same name. The largest is about 30 miles in circumference; and the soil of them all produces corn, wine, and fruits. The sea of Marmora is a large gulph, which communicates both with the Archipelago and the Black Sea by that of Constantinople, being 120 miles in length, and 50 in breadth, and all ships must pass through it that sail to Constantinople from the Mediterranean. It was anciently the *Propontis*.

MARMORICA, a country of Africa anciently inhabited by the Libyans. It was bounded on the east by Egypt, on the west by Cyrenaica, on the south by Sahara, or the desert of Libya Interior, and on the north by the Mediterranean; and was reckoned a part of Egypt. There is no distinct history of the country.

MARONITES, certain eastern Christians so called, who inhabit near mount Libanus in Syria. The name is derived either from a town in the country, called *Maronia*; or from *St Maron*, who built a monastery there in the fifth century.

The Maronites hold communion with the Romish church. Pope Gregory XIII. founded a college at Rome, where their youth are educated, and then sent to their own country. They formerly followed the errors of the Jacobites, Nestorians, and Monothelites; but they were re-united to the Roman church in the time Gregory XIII. and Clement VIII. The patriarch of the Maronites was present in the fourth Lateran Council, under Innocent III. in 1215.

The Maronites have their patriarch, archbishops, bishops, and about 150 inferior clergy, who are so oppressed by the Turks, that they are reduced to work for their living. They keep Lent according to the ancient rigour, eating but one meal a-day, and that after mass, which is said at 4 o'clock in the afternoon. Their priests are distinguished by a blue scarf, which they wear about their caps. Married men may become priests, but none may marry after he is in orders. They wear no surplices, observe particular fasts and



Maroon, and castles, and differ in many other things from the church of Rome.

The patriarch of the Maronites is a monk of St Anthony, claims the title of patriarch of Antioch, and is always called *Peter*. He has about nine bishops under him; and resides at Edem Canobin, a monastery built on a rock. They read their service both in the vulgar language and in Latin; and, while they perform it, turn their heads sometimes on one side, and sometimes on the other, pronouncing the word *Num* or *Eynam* softly, which signifies *yes*, or *yes verily*, by which they express their assent to what they read. They have so great a veneration for their bishops, that they often prostrate themselves before them.

In 1180, the Maronites were above 40,000 in number, and very valiant. They did the kings of Jerusalem great service against the Saracens.

Besides several convents of Maronite monks, there is one of nuns, who are highly esteemed for their sanctity. This edifice is no more than a church, in which the nuns are shut up close, like pigeons in their holes, in little corners or cells, which are so low, that few of them can stand upright or turn themselves round in them.

To MAROON, to put one or more sailors ashore upon a desolate island, under pretence of their having committed some great crime. This detestable expedient has been repeatedly practised by some inhuman commanders of merchant-ships, particularly in the West Indies.

MAROT (CLEMENT), the best French poet of his time, was born at Cahors in 1495; and was the son of John Marot, valet de chambre to Francis I. and poet to queen Anne of Brittany. He enjoyed his father's place of valet de chambre to Francis I. and was page to Margaret of France wife to the duke of Alençon. In 1521 he followed that prince into Italy, and was wounded and taken prisoner at the battle of Pavia; but at his return to Paris was accused of heresy, and thrown into prison, from whence he was delivered by the protection of king Francis I. He at length retired to the queen of Navarre, then to the dukes of Ferrara, and in 1536 returned to Paris; but declaring openly for the Calvinists, he was obliged to fly to Geneva, which he at length left, and retired to Piedmont, and died at Turin in 1544, aged 50. His verses are agreeably filled with natural beauties. La Fontaine acknowledged himself his disciple, and contributed greatly to restore to vogue the works of this ancient poet. Marot, besides his other works, has translated part of the Psalms into verse, which was continued by Beza, and are still sung in the Protestant churches abroad.—Michael Marot, his son, was also the author of some verses; but they are not comparable to those of John, and much less to those of Clement Marot.—The works of the three Marots were collected and printed together at the Hague, in 1731, in 3 vols 4to. and in 6 vols 12mo.

MARPURG, a strong and considerable town of Germany, in the Upper Rhine, and in the landgrate of Hesse-Cassel, with an university, a castle, a palace, a handsome square, and a magnificent town-house. It is seated on the river Lahn, in a pleasant

country, 15 miles south of Waldeck, and 47 south-west of Cassel. E. Long. 8. 53. N. Lat. 50. 42.

MARPURG, a handsome town of Germany, in Lower Styria, seated on the river Drave, 25 miles south-west of Gratz, and 60 north-east of Laubach. E. Long. 16. 10. N. Lat. 46. 42.

MARQUARD (Freher), an eminent German civilian, born at Augsborg in 1565. He studied at Bourges, under the learned Cujas; and acquired great skill in polite literature, and in the laws. At his return to Germany, he became counsellor to the elector Palatine, and professor of law at Heidelberg; and was afterwards sent by the elector Frederic IV. as his minister, into Poland, to Mentz, and several other courts. He died at Heidelberg in 1614. He wrote many works which are esteemed; the principal of which are, 1. *De re monetaria veterum Romanorum, & hodierni apud Germanos imperii.* 2. *Reverum Bohemicarum scriptores.* 3. *Reverum Germanicarum scriptores.* 4. *Corpus historię Francię, &c.*

MARQUE, or *Letters of MARQUE*, in military affairs, are letters of reprisal, granting the subjects of one prince or state liberty to make reprisals on those of another.—They are so called from the German *marcke*, "limit, frontier;" as being *jus concessum in alterius principis marchas seu limites transgredi, sibi que ejus faciendi*; as being a right of passing the limits or frontiers of another prince, and doing one's self justice.

Letters of marque among us are extraordinary commissions granted by authority for reparation to merchants taken and despoiled by strangers at sea; and reprisals is only the retaking, or taking of one thing for another \*. The form in these cases is, the sufferer \* See *Præ-* must first apply to the lord privy-seal, and he shall make out letters of request under the privy-seal; and if, after such request of satisfaction made, the party required do not, within convenient time, make due satisfaction or restitution to the party grieved, the lord chancellor shall make him out letters of marque under the great seal; and by virtue of these he may attack and seize the property of the aggressor nation, without hazard of being condemned as a robber or pirate.

MARQUESAS ISLANDS, the name of certain islands in the South Sea, lying between eight and ten degrees of south latitude, and between 139 and 140 degrees of west longitude. They are five in number, viz. La Magdalena, St Pedro, La Dominica, Santa Christina, and Hood Island. All the natives of their islands may be supposed to be of the same tribe. Those spots that are fit for culture are very populous; but as every island is very mountainous, and has many inaccessible and barren rocks, it is to be doubted whether the whole population of this group amounts to 50,000 persons. The Spaniards, who first visited here, found the manners of this people gentle and inoffensive; but these qualities did not prevent those who landed from wantonly butchering several of the natives at Magdalena.

The inhabitants of these islands collectively, says captain Cook, are, without exception, the finest race of people in the South-Sea. For symmetry of shape, and regular features, they perhaps surpass all other nations. Not a single deformed or ill-proportioned person was seen on the island; all were strong, tall, well-limbed, and remarkably active. The men are about

five feet ten or six inches high; their teeth are not so good, nor are their eyes so full and lively, as those of many other nations: their hair is of many colours, but none red; some have it long, but the most general custom is to wear it short, except a bunch on each side the crown, which they tie in a knot: their countenances are pleasing, open, and full of vivacity: they are of a tawny complexion, which is rendered almost black by punctures over the whole body. They were entirely naked, except a small piece of cloth round their waist and loins. The punctures were disposed with the utmost regularity, so that the marks on each leg, arm, and cheek, were exactly similar. The women, in two days time, began to appear in considerable numbers, and the sailors found them not less kind than those of the other islands which they had visited: they were inferior to the men in stature, but well proportioned; their general colour was brown; no punctures were observed upon them; they wore a single piece of cloth made of the mulberry bark, which covered them from the shoulders to the knees.

The principal head-dress used in the islands, and what appear to be their chief ornament, is a sort of broad fillet, curiously made of the fibres of the husks of cocoa-nuts; in the front is fixed a mother-of-pearl shell, wrought round to the size of a tea-saucer; before that another smaller, of very fine tortoise-shell, perforated into curious figures; also before, and in the centre of that, is another round piece of mother-of-pearl, about the size of half a crown; and before this another piece of perforated tortoise-shell, the size of a shilling. Besides this decoration in front, some have it also on each side, but in small pieces; and all have fixed to them the tail-feathers of cocks, or tropic-birds, which when the fillet is tied on stand upright, so that the whole together makes a very sprightly ornament. They wear round the neck a kind of ruff, or necklace, made of light wood, the outward and upper sides covered with small peas, which are fixed on with gum; they also wear some bunches of human hair fastened to a string, and tied round the legs and arms. But all the above ornaments are seldom seen on the same person. All these ornaments, except the last, they freely parted with for a trifling consideration; but the human hair they valued very highly, though these bunches were the usual residence of many vermin. It is probable, that these were worn in remembrance of their deceased relations, and therefore were looked upon with some veneration; or they may be the spoils of their enemies, worn as the honourable testimonies of victory. However, a large nail, or something which struck their eyes, commonly got the better of their scruples. The king, or chief of the island, came to visit captain Cook; he was the only one seen completely dressed in this manner. Their ordinary ornaments are necklaces, and amulets made of shells, &c. All of them had their ears pierced, though none were seen with ear-rings. The king had not much respect paid him by his attendants: he presented captain Cook with some fruit and hogs; and acquainted him that his name was *Honoa*, and that he was *he-ka-ai*, which title seems to correspond with the *aree* of O-Taheitee, and *areke* of the Friendly Isles. Their dwellings are in the valleys, and on the sides of the hills near their plantations. They are built in the same manner as those

at O-Taheitee, which will be particularly described when we speak of that island; but they are much meaner, and are only covered with the leaves of the bread-fruit tree: in general, they are built on a square or oblong pavement of stone, raised some height above the level of the ground; they likewise have lath pavement near their houses, on which they sit to eat and amuse themselves. Along the uppermost edge of the mountain a row of stakes, or palisades closely connected together, were seen like a fortification, in which, by the help of glasses, appeared something like huts, which seemed to bear a great resemblance to the hip-pas of New-Zealand, which will be described in speaking of that country. Their canoes resemble those of O-Taheitee, but not so large; their heads had commonly some flat upright piece, on which the human face was coarsely carved; and their sails were made of mats, triangular in shape, and very broad at the top: the paddles which they used were of heavy, hard wood, short, but sharp-pointed, and with a knob at the upper end; they were from 10 to 20 feet long, and about 15 inches broad.

Their weapons were all made of the club-wood, or casuarina; and were either plain spears about 8 or 10 feet long, or clubs which commonly had a knob at one end. They have also slings with which they throw stones with great velocity, and to a great distance, but not with a good aim.

The language of these people is much nearer to that of O-Taheitee, than any other dialect in the South-Sea, except that they could not pronounce the letter *r*.

The only quadrupeds seen here were hogs, except rats; here were fowls, and several small birds in the woods, whose notes were very melodious. The chief difference between the inhabitants of the Marquesas and those of the Society-Islands, seems to consist in their different degrees of cleanliness: the former do not bathe two or three times a-day, nor wash their hands and face before and after every meal, as the latter do; and they are besides very slovenly in the manner of preparing their meals. Their diet is chiefly vegetable; though they have hogs and fowls, and catch abundance of fish at certain times. Their drink is pure water, cocoa-nuts being scarce here.

It was not long before the propensity of the natives was discovered to be, rather to receive than give; for when they had taken a nail as the price of a bread-fruit, the article so purchased could not be obtained from them. To remove this dishonest disposition, captain Cooke ordered a musket to be fired over their heads, which terrified them into fair-dealing.

Soon after the natives had gathered courage enough to venture on board the ship, one of them unfortunately stole an iron stanchion from the gang-way, with which he sprang into the sea, and, notwithstanding its weight, swam with it to his canoe, and was making to the shore with all speed. A musket was fired over his head to frighten him back, but to no effect, he still continued to make off with his booty; the whistling of another ball over his head was as ineffectual: an officer, less patient of such an injury than reason and humanity should have taught him to be, levelled a musket at the poor fellow, and shot him thro' the head. Captain Cook had given orders to fire over the

the canoe, but not to kill any one; he was in a boat, and came up with the canoe soon after. There were two men in her: one fat bailing out the blood and water in a kind of hyleric laugh; the other, a youth of about 14 or 15 years of age, who afterwards proved to be the son of the deceased, fixed his eyes on the dead body with a serious and dejected countenance. This act of severity, however, did not estrange the islanders to the ship, and a traffic was carried on to the satisfaction of both parties; bread-fruit, bananas, plantains, and some hogs, were given in exchange for small nails, knives, and pieces of Amsterdam cloth; red feathers of the Amsterdam-Island were greatly esteemed here. Captain Cook, accompanied with the gentlemen of the ship, in their walks about the country lit on the house which had been the habitation of the man who had been shot; there they found his son, who fled at their approach: they inquired for his female relations, and were told that they remained at the top of the mountain, to weep and mourn for the dead. Notwithstanding they were then among the relations of a man who had been killed by them, not the least tokens of animosity, or revenge, were discernible among the natives.

The weather being extremely hot, the inhabitants made use of large fans to cool themselves, of which great numbers were purchased; these fans were formed of a kind of tough bark, or grass, very firmly and curiously plaited, and frequently whitened with shell-lime. Some had large feathered leaves of a kind of palm, which answered the purpose of an umbrella.

The natives at length became so familiar as to mount the sides of the ship in great numbers. They frequently danced upon deck for the diversion of the sailors: their dances very much resembled those of O-Tahetee; their music too was very much the same.

A sailor having been inattentive to his duty, received several blows from captain Cook; on seeing which, the natives exclaimed, *tape-a hei-te tina*, "he beats his brother." From other instances that had occurred, it was clear that they knew the difference between the commander and his people, but at the same time they conceived them all brethren; and, says Mr Forster, "to me the most natural inference is, that they only applied an idea to us in this case, which really existed with regard to themselves; they probably look on themselves as one family, of which the eldest born is the chief or king."

**MARQUETRY, IN-LAID WORK**; a curious kind of work, composed of pieces of hard fine wood of different colours, fastened, in thin slices, on a ground, and sometimes enriched with other matters, as tortoise-shell, ivory, tin, and brass.

There is another kind of marquetry made, instead of wood, of glasses of various colours; and a third, where nothing but precious stones, and the richest marbles, are used: but these are more properly called *mosaic work*. See **MOSAIC**.

The art of inlaying is very ancient; and is supposed to have passed from the east to the west, as one of the spoils brought by the Romans from Asia. Indeed it was then but a simple thing; nor did it arrive at any tolerable perfection, till the 15th century, among the

Italians: it seems, however, to have arrived at its height in the 17th century, among the French.

Till John of Verona, a cotemporary with Raphael, the finest works of this kind were only black and white, which are what we now call *Moresco's*; but that religious, who had a genius for painting, stained his woods with dyes or boiled oils, which penetrated them. But he went no further than the representing buildings and perspectives, which require no great variety of colours. Those who succeeded him, not only improved on the invention of dyeing the woods, by a secret which they found of burning them without consuming, which served exceedingly well for the shadows; but had also the advantage of a number of fine new woods of naturally bright colours, by the discovery of America. With these assistances the art is now capable of imitating any thing; whence some call it the *art of painting in wood*.

The ground whereon the pieces are to be ranged and glued, is ordinarily of oak or fir well dried; and to prevent warping, is composed of several pieces glued together. The wood to be used, being reduced into leaves, of the thickness of a line, is either stained with some colour, or made black for shadow; which some effect by putting it in sand extremely heated over the fire, others by steeping it in lime-water and sublimate, and others in oil of sulphur.—Thus coloured, the contours of the piece are formed, according to the parts of the design they are to represent.

The last is the most difficult part of marquetry, and that wherein most patience and attention are required. The two chief instruments used herein are the saw and the vice; the one, to hold the matters to be formed; the other, to take off from the extremes, according to occasion. The vice is of wood, having one of its chaps fixed, the other moveable, and is opened and shut by the foot, by means of a cord fastened to a treadle. Its structure is very ingenious, yet simple enough.

The leaves to be formed (for there are frequently three or four of the same kind formed together) are put within the chaps of the vice, after being glued on the outermost part of the design whose profile they are to follow; then the workmen pressing the treadle, and thus holding fast the piece, with his saw runs over all the out-lines of the design.—By thus joining and forming three or four pieces together, they not only gain time, but the matter is likewise the better enabled to sustain the efforts of the saw; which, how delicate soever it may be, and how lightly soever the workman may conduct it, without such a precaution, would be apt to raise splinters, to the ruin of the beauty of the work.

When the work is to consist of one single kind of wood, or of tortoise-shell, on a copper or tin ground, or *vice versa*, they only form two leaves on one another, i. e. a leaf of metal, and a leaf of wood or shell: this they call *sawing in counter-parts*; for by filling the vacuities of one of the leaves by the pieces coming out of the other, the metal may serve as a ground to the wood, and the wood to the metal.

All the pieces thus formed with the saw, and marked to know them again, and the shadow given in the manner already mentioned; they vaneer or falten each in its place on the common ground; using for that purpose



Marquis  
|  
Marriage.

pose the best English glue.

The whole is put in a press to dry, planed over, and polished with the skin of the sea-dog, wax, and flavegrafs, as in simple varnishing; with this difference, however, that in marquetry the fine branches, and several of the more delicate parts of the figures, are touched up and finished with a graver.

It is the cabinet-makers, joiners, and toy-men among us, who work in marquetry; it is the enamellers and stone-cutters, who deal in mosaic work: the instruments used in the former are mostly the same with those used by the ebenists.

MARQUIS, a title of honour, next in dignity to that of duke. His office is to guard the frontiers and limits of the kingdom, which were called the *marches*, from the Teutonic word *marche*, a limit: as, in particular, were the marches of Wales and Scotland, while they continued hostile to England. The persons who had command there, were called *lords marchers*, or *marquesses*; whose authority was abolished by statute 27 Hen. VIII. c. 27. though the title had long before been made a mere design of honour, Robert Vere earl of Oxford being created marquis of Dublin by Richard II. in the eighth year of his reign. A marquis is created by patent; his mantle is double ermine, three doublings and a half; his title is *most noble*; and his coronet has pearls and strawberry-leaves intermixed round, of equal height.

MARR, that part of Aberdeenshire situated between the rivers Dee and Don.

MARRIAGE, a contract, both civil and religious, between a man and a woman, by which they engage to live together in mutual love and friendship for the ends of procreation, &c. See MORAL PHILOSOPHY, n° 125, &c.

The first inhabitants of Greece lived together without marriage. Cecrops, king of Athens, was the first author of this honorable institution among that people. After the commonwealths of Greece were settled, marriage was very much encouraged by their laws; and the abstaining from it was discountenanced, and in many places punished. The Lacedæmonians were particularly remarkable for their severity towards those who deferred marrying, as well as to those who wholly abstained from it. The Athenians had an express law, that all commanders, orators, and persons entrusted with any public affair, should be married men. Polygamy, or the having more than one wife at a time, was not commonly tolerated in Greece. See POLYGAMY.

The time of marriage was not the same in all places; the particular number of years to which they were limited, depended upon the humour of each lawgiver, nothing being generally agreed on this matter.

The Greeks thought it scandalous to contract marriage within certain degrees of consanguinity; while most of the barbarous nations allowed incestuous mixtures. Most of the Grecian states required that citizens should match with none but citizens; and the children were not allowed to marry without the consent of their parents: when there were orphan-virgins without any inheritance, the next of kin was obliged to marry them, or to settle a portion on them according to his quality.

The Romans, as well as the Greeks, disallowed of

polygamy. A Roman might not marry any woman who was not a Roman. It was thought dishonourable for a woman to marry twice. Among the Romans, the kalends, nones, and ides, of each month were thought unlucky to be married in, as was also the feast of the parentalia, or feralia, and the whole month of May was reckoned the most unhappy season.

We find but few laws in the books of Moses concerning the institution of marriage: he restrained the Israelites from marrying within certain degrees of consanguinity; but we find that polygamy, though not expressly allowed, is however tacitly implied in the laws of Moses: there is a particular law that obliged a man, whose brother died without issue, to marry his widow, and raise up children to his brother. The Hebrews purchased their wives, by paying down a competent dowry for them; and a man was at liberty to marry, not only in any of the 12 tribes, but even out of them, provided it was with such nations as used circumcision.

The ancient Christian church laid several restraints upon her members in relation to marriage; such was the rule forbidding Christians to marry with infidels and heathens; another restraint related to the consanguinity and affinity prohibited in Scripture: a third was, that children under age should not marry without the consent of their parents, guardians, or next relations; and another was, that there should be some parity of condition between the contracting parties. They not only condemned polygamy, but even reckoned it unlawful to marry after a divorce. As to the season in which marriage might or might not be celebrated in the Christian church, all we find is, that it was forbidden in Lent. The Romish church requires of the clergy perpetual abstinence from marriage; and has advanced this institution to the dignity of a sacrament. The church of England, though she does not consider marriage as a sacrament, yet looks upon it as an institution so sacred, as that it ought always to be celebrated by an ecclesiastical person; but marriages, without this sanction, are not therefore null and void. There is no canon of this church, which forbids marriages to be solemnized at any time. The canonical hours for celebrating of matrimony, are from eight to twelve in the forenoon. The impediments to marriage are specified in canon 102 of the English church, and are these: 1. A preceding marriage or contract, or any controversy or suit depending on the same. 2. Consanguinity or affinity. 3. Want of consent of parents, or guardians, &c.

Marriage, according to our law, cannot be dissolved but by death, breach of faith, or other notorious misbehaviour. It is requisite to complete a marriage, that there be a free and mutual consent between the parties. The marriages performed by Romish priests, whose orders are acknowledged by the church of England, are deemed good in some instances; but they ought to be solemnized agreeable to the rites of our own church, to be intitled to the benefits attending on marriage here, such as dower, thirds, &c. A marriage in reputation, as among the quakers, is allowed to be sufficient to give title to a personal estate; though in the case of a person married by a dissenting minister, who was not in orders, it has been held, that where a husband demands a right due to him as such

Marriage.

**Marriage.** by the ecclesiastical law, he ought to prove himself a husband, thereby to be intitled to it; and yet this marriage is not altogether a nullity, because, by the laws of nature, the contract is binding. On a promise of marriage, if it be mutual on both sides, damages may be recovered in case either party refuses to marry: and though no time for the marriage be agreed on, if the plaintiff aver that he offered to marry the defendant, who refused it, an action is maintainable for the damages; but no action shall be brought upon any agreement, except it is in writing, and signed by the party to be charged.

For the better preventing clandestine marriages, and the inconveniences arising therefrom, an act of parliament was passed, wherein the following regulations were made, viz. That from and after March 25, 1754, banns of matrimony shall be published in the parish-church, or some public chapel belonging to the parish wherein the parties dwell, upon three Sundays before the marriage, during the time of service, immediately after the second lesson: and where the parties dwell in different parishes, the banns shall be published in both; and the marriage shall be solemnized in the church or chapel wherein the banns were published, and no-where else: and it is also required, that both or either of the parties to be married, do reside four weeks at least in the parish where the banns are published. Nothing in this act deprives the archbishop of Canterbury of his usual right of granting special licences to marry at any convenient time or place. All marriages solemnized contrary to the foregoing regulations, shall be void; and the person solemnizing the same, shall be adjudged guilty of felony, and be transported for 14 years to his majesty's colonies. Marriages solemnized by licence, where either of the parties (not being a widow or widower,) shall be under age, without the consent of the father first had (if living), or of the guardians or one of them, and, where there shall be no guardians, of the mother (if living and unmarried), or of the guardian appointed by chancery, shall be void to all intents and purposes. Where any such guardian shall be *non compos mentis*, or in parts beyond the sea, or shall refuse their consent to a proper match, the party may apply by petition to the lord-chancellor, lord-keeper, or lords commissioners of the great seal, who shall proceed on such a petition in a summary way; and where the marriage proposed shall appear to be proper, they shall judicially declare the same to be so by an order of court, which shall be deemed effectual. All marriages shall be solemnized in the presence of two or more creditable witnesses besides the minister; and an entry thereof shall be immediately made in a register kept for that purpose. This act shall not extend to the marriages of any of the royal family, nor to Scotland, nor to those persons called *quakers*; nor those professing the Jewish religion. See **LAW**, n° clx.

**Policy of encouraging MARRIAGE.** Dr Halley observes, that the growth and increase of mankind is not so much stunted by any thing in the nature of the species, as it is from the cautious difficulty most people make to adventure on the state of marriage, from the prospect of the trouble and charge of providing for a family: nor are the poorer sort of people herein to be blamed, who, besides themselves and families, are

obliged to work for the proprietors of the lands that feed them; and of such does the greater part of mankind consist. Were it not for the backwardness to marriage, there might be four times as many births as we find; for by computation from the table given under the article **MORTALITY**, there are 15,000 persons above 16 and under 45, of which at least 7000 are women capable of bearing children; yet there are only 1238, or little more than a sixth part of these, that breed yearly: whereas, were they all married, it is highly probable that four of six should bring forth a child every year, the political consequences of which are evident. Therefore, as the strength and glory of a kingdom or state consists in the multitude of subjects, celibacy above all things ought to be discouraged, as by extraordinary taxing or military service: and, on the contrary, those who have numerous families should be allowed certain privileges and immunities, like the *jus trium liberorum* among the Romans; and especially, by effectually providing for the subsistence of the poor.

**MARROW**, in anatomy, a soft oleaginous substance contained in the cavity of the bones. See **ANATOMY**, n° 5.

**MARRUBIUM**, WHITE HOREHOUND; a genus of the gymnospermia order, belonging to the didymia class of plants. There are nine species, the most remarkable of which is the vulgar, a native of Britain, growing naturally in waste places, and by way-sides near towns and villages, but not common. It has a strong and somewhat musky smell, and bitter taste. It is reputed attenuant and resolvent; an infusion of the leaves in water, sweetened with honey, is recommended in asthmatical and phtisical complaints, and most other diseases of the breast and lungs.

**MARS**, in astronomy. See there, n° 4. 22. 44. 151.

**MARS**, in Pagan worship, the god of war. He was, according to some, the son of Jupiter and Juno; while others say that he was the son of Juno alone, who, being displeased at Jupiter's having produced Minerva from his brain, in revenge conceived by touching a flower, and became the mother of this formidable deity. The amours of Mars and Venus, and the manner in which Vulcan caught and exposed them to the laughter of the other gods, have been described by several of the ancient poets. He is represented as having several wives and mistresses, and a considerable number of children. He was held in the highest veneration by the Romans, both from his being the father of Romulus their founder, and from their inclination to conquest; and had magnificent temples erected to him at Rome.

Mars is usually represented in a chariot, drawn by furious horses. He is completely armed; and extends his spear with the one hand, and grasps a sword, imbrued in blood, with the other. He has a fierce and savage aspect. Discord is represented preceding his car; and Clamour, Fear, and Terror, appear in his train. The victims sacrificed to him were the wolf, the horse, the wood-pecker, the vulture, and the cock.

**MARS**, among chemists, denotes *iron*; that metal being supposed to be under the influence of the planet Mars.

**MARSAL**, a town of France, in Lorraine, remarkable

Marſals  
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Marm.

markable for its ſalt-works; ſeated in a marſh on the river Selle, of difficult acceſs, which, together with the fortifications, render it an important place. E. Long. 6. 43. N. Lat. 48. 46.

MARSALA, an ancient and ſtrong town of Sicily, in the valley of Mazara. It is well peopled, and built on the ruins of the ancient Lilybæum. E. Long. 12. 37. N. Lat. 37. 52.

MARSAN, or MOUNT-MARSAN, a town of France, in Gaſcony, and capital of a ſmall territory of the ſame name, fertile in wine; ſeated on the river Miſdume, in W. Long. o. 39. N. Lat. 44. o.

MARSAQUIVEK, or MARSAQUIVER, a ſtrong and ancient town of Africa, on the coaſt of Barbary, and in the province of Beni-Arax, in the kingdom of Tremefen, with one of the beſt harbours in Africa. It was taken by the Spaniards in 1732. It is ſeated on a rock near a bay of the ſea, in W. Long. o. 10. N. Lat. 35. 40.

MARSEILLES, a ſtrong ſea-port town, and the moſt rich and trading place of Provence, in France. Here is a good harbour, where the French galleys are ſtationed; for it will not admit large men of war. It is divided into the Old Town and the New: in the Old, the houſes are not ſo well built as in the other. They are ſeparated by a ſtreet, bordered by trees on each ſide. It is ſaid to contain 100,000 inhabitants. It is one of the moſt trading towns in France, to which its harbour contributes, which has a chain acroſs its mouth. Without the walls is the caſtle of Notre Dame, which is very well fortified. It is a biſhop's ſee, and there is a French academy, it having been noted at all times for men of learning. In 1660, Lewis XIV. built the citadel and fort St John to keep the inhabitants in awe, becauſe they pretended to be free. The Jeſuits had a very fine obſervatory here; and in the arſenal, built not long ago, there are arms for 40,000 men. In the Houſe of Diſcipline they weave gold, ſilver, and ſilk brocades. They reckon 2000 country-houſes round Marseilles, where the inhabitants go in ſummer to take the air. The public buildings are very vandome; and the fineſt drugs are brought thither from all parts of the world. It is ſeated on the north ſhore of the Mediterranean, in E. Long. 4. 27. N. Lat. 43. 18.

MARSH (Narciffus), an exemplary Iriſh prelate, born at Hannington in Wiltſhire in 1638. He was made principal of St Alban's hall, Oxford, in 1673, but removed to the proviceſhip of Dublin college in 1678. He was promoted to the biſhopric of Leighlin and Ferns in 1682, tranſlated to the archbiſhopric of Caſhel in 1690, to Dublin in 1694, and to Armagh in 1703. While he held the ſee of Dublin, he built a noble library for the uſe of the public, filled it with choice books, and ſettled a proviſion for two librarians. He repaired, at his own expence, ſeveral decayed churches, beſides buying in and reſtoring many impropriations, and preſenting a great number of oriental MSS. to the Bodleian library. He was a very learned and accompliſhed man; was well verſed in ſacred and prophane literature, in mathematics, natural philoſophy, the learned languages, eſpecially the oriental, and in both the theory and practice of muſic. He publiſhed, 1. *Inſtitutiones logicæ*. 2. *Manuſcriptio ad logicam*, written by Philip de

Trien; to which he added the Greek text of Ariſtotle, and ſome ſome tables and ſchemes. 3. An introductory eſſay on the doctrine of ſounds, &c. He died in 1713.

MARSH, ſignifies a piece of ground ſlowed with water, yet ſo that the graſs and other vegetables riſe above the ſurface of the water, and, by their decaying, give riſe to putrid effluvia, which are very pernicious to the human body.

MARSHAL, in its primary ſignification, means an officer who has the command or care of horſes; but it is now applied to officers who have very different employments, as *earl-marſhal*, *knight-marſhal*, *marſhal of the king's houſe*, &c.

MARSHAL of the King's-bench, an officer who has the cuſtody of the King's-bench priſon in Southwark. This officer is obliged to give his attendance, and to take into his cuſtody all perſons committed by that court.

MARSHAL of the Exchequer, an officer to whom that court commits the king's debtors.

MARSHAL of the King's Hall, an officer who has the care of placing the houſhold ſervants and ſtrangers at table, according to their quality.

MARSHAL or Mareſchal of France, an officer of the greateſt dignity in the French armies. When two or more marſhals are in the army, the eldeſt commands.

MARSHAL (Thomas), a very learned Engliſh divine in the 17th century, was educated at Oxford. This city being gariſoned upon the breaking out of the civil wars, he bore arms for the king. Afterward he had ſeveral ſucceſſive preferments in the church; and died at Lincoln-college, of which he was rector. By his will he left all his books and MSS. to the univerſity of Oxford, and money to Lincoln-college for the maintenance of three ſcholars. He was a noted critic, eſpecially in the Gothic and Engliſh-Saxon tongues; and eminent for his piety and other valuable qualities. He wrote, 1. *Observationes in Evangeliorum verſiones per antiquos duos, Goth. ſcilicet & Anglo-Sax.* &c. 2. Notes on the church-catechiſm, &c.

MARSHALLING a Coat, in heraldry, is the diſpoſal of ſeveral coats of arms belonging to diſtinct families in one and the ſame ſcutcheon or ſhield, together with their ornaments, parts, and appurtenances. See HERALDRY, chap. vi. p. 3510.

MARSHALSEA (the Court of), and the Palace-court at Weſtmiſter, though two diſtinct courts, are frequently confounded together. The former was originally holden before the ſteward and marſhal of the king's houſe, and was inſtituted to adminiſter juſtice between the king's domeſtic ſervants, that they might not be drawn into other courts, and thereby the king loſe their ſervice. It was formerly held in, though not a part of, the *aula regis*; and, when that was ſubdivided, remained a diſtinct juſdiction: holding plea of all treſpaſſes committed within the verge of the court, where only one of the parties is in the king's domeſtic ſervice, (in which caſe the inqueſt ſhall be taken by a jury of the country); and of all debts, contracts and covenants, where both of the contracting parties belong to the royal houſehold; and then the inqueſt ſhall be compoſed of men of the houſehold only. By the ſtatute of 13 Ric. II. ſ. 1.

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Marſhalſea



c. 3. (in affiance of the common law,) the verge of the court in this respect extends for 12 miles round the king's place of residence. And, as this tribunal was never subject to the jurisdiction of the chief justiciary, no writ of error lay from it (though a court of record) to the king's bench, but only to parliament, till the statutes of 5 Edw. III. c. 2. and 10 Edw. III. ft. 2. c. 3. which allowed such writ of error before the king in his place. But this court being ambulatory, and obliged to follow the king in all his progresses, so that by the removal of the household, actions were frequently discontinued, and doubts having arisen as to the extent of its jurisdiction, king Charles I. in the sixth year of his reign, by his letters-patent erected a new court of record, called the *curia palatii*, or *palace-court*, to be held before the steward of the household and knight-marshal, and the steward of the court, or his deputy; with jurisdiction to hold plea of all manner of personal actions whatsoever, which shall arise between any parties within 12 miles of his majesty's palace at Whitehall. The court is now held once a week, together with the ancient court of marshallea, in the borough of Southwark: and a writ of error lies from thence to the court of king's bench. But if the cause is of any considerable consequence, it is usually removed on its first commencement, together with the custody of the defendant, either into the king's bench or common-pleas by a writ of *habeas corpus cum causa*: and the inferior business of the court hath of late years been much reduced, by the new courts of conscience erected in the environs of London; in consideration of which the four counsel belonging to these courts had salaries granted them for their lives by the stat. 23 Geo. II. c. 27.

MARSHAM (Sir John), a very learned English writer in the 17th century. He studied the law in the Middle Temple, and was sworn one of the six clerks in the court of chancery in 1638. In the beginning of the civil war he followed the king to Oxford; for which he was sequestrated of his place by the parliament at Westminster, and plundered. After the declining of the king's affairs, he returned to London; compounded, among other royalists, for his real estate; and betook himself wholly to his studies and a retired life, the fruits of which were some excellent works. He wrote *Diatriba Chronologica*; *Chronicus Canon*, *Ægyptiacus*, *Ebraicus*, *Græcus*, &c. He died in 1685.

MARSHMALLOW, in botany. See ALTHÆA.

MARSICO NUOVO, a small, rich, and handsome town of Italy, in the kingdom of Naples, and in the Hither Principato, with a bishop's see. It is seated at the foot of the Apennines, near the river Agri, in E. Long. 15. 49. N. Lat. 20. 42.

MARSIGLI (Lewis Ferdinand, count), an Italian famous for letters as well as arms, was descended from an ancient and noble family, and born at Bologna in 1658. He acquired a great knowledge in the art of war and fortification; served under the emperor Leopold II. against the Turks, by whom he was taken prisoner in 1683, but redeemed after a year's captivity. In the Spanish succession war, Marsigli, then advanced to the rank of marshal, being in the fortress of Brisac, which surrendered to the duke of Burgundy in 1703, when the place was deemed

capable of holding out much longer; the count d'Arco who commanded was beheaded, and Marsigli, stripped of all his commissions, had his sword broke over him. He now fought for consolation in the sciences; as, amidst all the hurry and fatigue of war, he had made all the advantages the most philosophic man could do, who had travelled purely in quest of knowledge. He had a rich collection of every thing proper to the advancement of natural knowledge, instruments astronomical and chemical, plans of fortification, models of machines, &c. all which he presented to the senate of Bologna by an authentic act in 1712, forming at the same time out of them what he called the *institute of the arts and sciences at Bologna*. He also founded a printing-house, and furnished it with the best types for Latin, Greek, Hebrew, and Arabic, which he presented in 1728 to the Dominicans at Bologna, on condition of their printing all the writings of the *institute* at prime cost: this was called the *printing-house of St Thomas Aquinas*. His writings on philosophical subjects are numerous and valuable, in Latin, Italian, and French: he died in 1730.

MARSTON (John), an English dramatic writer, who lived in the time of James I. Wood says he was a student in Corpus Christi college, Oxford; but we neither know his family, nor the time of his birth. He contributed eight plays to the stage, which were all acted at Black-friars with applause; and one of them, called the *Dutch Courtizan*, was once revived since the Restoration, under the title of the *Revenge*, or a *Match in Newgate*. There is no account when he died; but we find his works were published after his death by Shakespeare, and may thence reasonably conclude that it happened about the year 1614. He was a chaste and pure writer; avoiding all that obscenity, ribaldry, and scurrility, which too many of the play-wrights of that time, and indeed much more so in some periods since, have made the basis of their wit, to the great disgrace and scandal of the stage.

MARSYAS, in fabulous history, a Phrygian who excelled in playing on the flute. Arriving at Nysa, he presumed to dispute with Apollo the prize of music: but that god, singing to his lyre, was decreed the conqueror; when, being enraged at Marsyas's presumption, he had him tied to an oak, and flayed alive. Apollo afterwards changed him into a river of Phrygia, which was therefore called by his name. See APOLLO.

MART, a great fair held every year for buying and selling goods. Public marts, or places of buying and selling, such as markets and fairs, with the tolls thereunto belonging, can only be set up by virtue of the king's grant, or by long and immemorial usage and prescription, which presupposes such a grant. The limitation of these public resorts, to such time and place as may be most convenient for the neighbourhood, forms a part of oeconomics, or domestic polity; which, considering the kingdom as a large family, and the king as the master of it, he has clearly a right to dispose and order as he pleases.

MARTABAN, a province of Asia in the kingdom of Pegu, lying in the gulph of Bengal. It is a country that produces rice and all kinds of fruits proper to the climate. It has mines of several sorts of metals,

Martha  
Martialis.

tals, and carries on a great trade. The chief town, which is of the same name, is rich, handsome, and very populous, with a good harbour. E. Long. 97. 50. N. Lat. 15. 35.

MARTHA (St.), a province of South America, on the coast of Terra Firma, bounded on the north by the North Sea, on the east by Rio de la Hache, on the south by New-Granada, and on the west by Carthagea. It is 300 miles in length and 200 in breadth, is a mountainous country, and the land very high. Here begins the famous ridge of mountains called the *Cordillera de los Andes*, which run from north to south the whole length of the continent of South America. It is extremely hot on the sea-coast; but cold in the internal parts, on account of the mountains. It abounds with the fruits proper to the climate; and there are mines of gold and precious stones, as also salt-works. The Spaniards possess but one part of this province, in which they have built Martha the capital. The air about the town is wholesome; and is seated near the sea, having a harbour surrounded with high mountains. It was formerly very considerable when the galleons were sent thither, but is now come almost to nothing. W. Long. 74. 11. N. Lat. 11. 20.

MARTHA (St.) or *Sierra Nevada*, a very high mountain in New Spain. Some say it is 100 miles in circumference at the bottom, and five miles in height. The top is always covered with snow in the hottest weather; and the French affirm, that they can perceive it from the island of St Domingo, which is 370 miles distant. W. Long. 74. 35. N. Lat. 8. 0.

MARTHA's Vineyard, an island of North America near the coast of New-England, 80 miles south of Boston. The inhabitants apply themselves chiefly to their fisheries, in which they have great success. W. Long. 70. 35. N. Lat. 41. 0.

MARTIAL LAW, is the law of war that depends upon the just but arbitrary will and pleasure of the king, or his lieutenant: for though the king doth not make any laws but by common consent in parliament, yet, in time of war, by reason of the necessity of it to guard against dangers that often arise, he useth absolute power, so that his word is a law. *Smith de Repub. Angl. lib. 2. c. 4.*

But the martial law, (according to Chief Justice Hale), is in reality not a law, but something indulged rather than allowed as a law; and it relates only to members of the army, being never intended to be executed on others, who ought to be ordered and governed by the laws to which they are subject, tho' it be a time of war. And the exercise of martial law, whereby any person might lose his life, or member, or liberty, may not be permitted in time of peace, when the king's courts are open for all persons to receive justice.

MARTIALIS (Marcus Valerius), a famous Latin poet, born at Bilbilis, now called *Bubiera*, in the kingdom of Arragon in Spain, was of the order of knights. He went to Rome at the age of 21, and staid there 35 years, under the reign of Galba and the succeeding emperors, till that of Trajan; and having acquired the esteem of Titus and Domitian, he was created tribune. At length, finding that he was neglected by Trajan, he returned to his own country

Bilbilis, where he married a wife, and had the happiness to live with her several years. He admires and commends her much, telling her that she alone was sufficient to supply the want of every thing he enjoyed at Rome. "*Romam tu mihi sola facis*," says he, in the 21st epigram of the 12th book. She appears like-wife to have been a lady of a very large fortune; for, in the 31st epigram of the same book, he extols the magnificence of the house and gardens he had received from her, and says that she had made him a little kind of monarch."

*Munera sunt domino: post septima lustra reverso,  
Hæc Marcella domos, parvaque regna dedit.*

There are still extant 14 books of his epigrams, filled with points, a play upon words, and obscenities. The style is affected. However, some of his epigrams are excellent; many of them are of the middling kind; but the greatest part of them are bad: so that Martial never spoke a greater truth, than when he said of his own works,

*Sunt bona, sunt quædam mediocra, sunt mala plura.*

There is also attributed to him a book on the spectacles of the amphitheatre; but the most learned critics think that this last work was not written by Martial. The best editions of Martial are, that in *Usurn Delphini*, 4to, Paris, 1617, and that *cum Notis Variorum*.

MARTIGUES, a sea-port town of France, in Provence, with the title of a principality; seated near a lake 12 miles long and five broad, which is navigable throughout, and from whence they get excellent salt. E. Long. 4. 20. N. Lat. 43. 28.

MARTIN (St.), a small but strong town of France, in the isle of Rhé, with a harbour and a strong citadel, fortified after the manner of Vauban. The island lies near the coast of Poitou. W. Long. 1. 0. N. Lat. 45. 40.

Cape MARTIN, a promontory of Valencia in Spain, near a town called *Denia*, and separates the gulph of Valencia from that of Alicante.

MARTIN (St.), an island of America, and one of the Caribbees, lying on the gulph of Mexico, to the north-west of St Bartholomew, and to the south-west of Anguilla. It is 42 miles in circumference; has neither harbour nor river, but several salt-pits. After various revolutions, it is at length in possession of the French and Dutch, who possess it conjointly. W. Long. 62. 35. N. Lat. 18. 15.

MARTIN, in zoology. See *HIRUDO* and *MUSTELA*.

Free MARTIN. See *HERMAPHRODITE*.

MARTINGALE, in the manege, a thong of leather, fastened to one end of the girths under a horse's belly, and at the other end to the muffs-roll, to keep him from rearing.

MARTINICO, the chief of the French Caribbee-islands, the middle of which is situated in W. Long. 61. 0. N. Lat. 14. 30.

This island was first settled by M. Desnambuc a Frenchman, in the year 1635, with only 100 men from St Christophers. He chose rather to have it peopled from thence than from Europe; as he foresaw, that men, tired with the fatigue of such a long voyage, would mostly perish soon after their arrival, either from the

Martigue  
Martinique.

Martinitico. the climate, or from the hardships incident to most emigrations. They completed their first settlement without any difficulty. The natives, intimidated by their fire-arms, or seduced by promises, gave up the western and southern parts of the island to the new comers. In a short time, however, perceiving the number of these enterprising strangers daily increasing, they resolved to extirpate them, and therefore called in the savages of the neighbouring islands to assist them. They fell jointly upon a little fort that had been hastily erected; but were repulsed, with the loss of 700 or 800 of their best warriors, who were left dead upon the spot.

After this check, the savages for a long time disappeared entirely; but at last they returned, bringing with them presents to the French, and making excuses for what had happened. They were received in a friendly manner, and the reconciliation sealed with pots of brandy. This peaceable state of affairs, however, was of no long continuance; the French took such undue advantages of their superiority over the savages, that they soon rekindled in the others that hatred which had never been entirely subdued. The savages, whose manner of life requires a vast extent of land, finding themselves daily more and more straitened, had recourse to stratagem, in order to destroy their enemies. They separated into small bands, and way-laid the French as they came singly out into the woods to hunt, and, waiting till the sportsman had discharged his piece, rushed upon and killed him before he could discharge it again. Twenty men had been thus assassinated before any reason could be given for their sudden disappearance: but as soon as the matter was known, the French took a severe and fatal revenge; the savages were pursued and massacred, with their wives and children, and the few that escaped were driven out of Martinitico, to which they never returned.

The French being thus left sole masters of the island, lived quietly on those spots which best suited their inclinations. At this time, they were divided into two classes. The first consisted of those who had paid their passage to the island, and these were called *inhabitants*; and to these the government distributed lands, which became their own, upon paying a yearly tribute. These inhabitants had under their command a multitude of disorderly people brought over from Europe at their expence, whom they called *engagés*, or bondsmen. This engagement was a kind of slavery for the term of three years; on the expiration of which they were at liberty, and became the equals of those whom they had served. They all confined themselves at first to the culture of tobacco and cotton; to which was soon added that of arnotto and indigo. The culture of sugar also was begun about the year 1650. Ten years after, one Benjamin D'Acosta, a Jew, planted some cocoa trees; but his example was not followed till 1684, when chocolate was more commonly used in France. Cocoa then became the principal support of the colonists, who had not a sufficient fund to undertake sugar-plantations; but by the inclemency of the season in 1718, all the cocoa trees were destroyed at once.—Coffee was then proposed as a proper object of culture. The French ministry had received as a present from the Dutch, two of these

trees, which were carefully preserved in the king's Martinitico. botanical garden. Two young shoots were taken from these, put on board a ship for Martinitico, and entrusted to the care of one Mr Desclieux. The ship happened to be straitened for want of fresh water; and the trees would have perished, had not the gentleman shared with them that quantity of water which was allowed for his own drinking. The culture of coffee was then begun, and attended with the greatest and most rapid success. About the end of last century, however, the colony had made but small advances. In 1700, it had only 6597 white inhabitants. The savages, mulattoes, and free negroes, men, women, and children, amounted to no more than 507. The number of slaves was but 14,566. All these together made a population of 21,645 persons. The whole of the cattle amounted to 3668 horses or mules, and 9217 head of horned cattle. The island produced a great quantity of cocoa, tobacco, and cotton; it had nine indigo-houses, and 183 small sugar plantations.

After the peace of Utrecht, Martinitico began to emerge from that feeble state in which it had so long continued. The island then became the mart for all the windward French settlements. In the ports of it the neighbouring islands sold their produce, and bought the commodities of the mother-country; and, in short, Martinitico became famous all over Europe. In 1736, there were on the island 447 sugar-works; 11,953,232 coffee-trees, 193,870 of cocoa; 2,068,480 plants of cotton, 39,400 of tobacco, 6,750 of arnotto. The supplies for provision consisted of 4,806,142 banana trees; 34,483,000 trenches of cassava; and 247 plots of potatoes and yams. The number of blacks amounted to 72,000; men, women, and children. Their labour had improved the plantations as far as was consistent with the consumption then made in Europe of American productions; and the annual exports from the island amounted to about 700,000 l.

The connections of Martinitico with the other islands entitled her to the profits of commission, and the charges of transport; as the alone was in the possession of carriages. This profit might be rated at the tenth of the produce; and the sum total must have amounted to near 765,000 l. This standing debt was seldom called in, and left for the improvement of their plantations. It was increased by advances in money, slaves, and other necessary articles; so that Martinitico became daily more and more a creditor to the other islands, and thus kept them in constant dependence; while they all enriched themselves by her assistance.

The connections of this island with Cape Breton, Canada, and Louisiana, procured a market for the ordinary sugars, the inferior coffee, the molasses, and rum, which would not sell in France. In exchange the inhabitants received salt-fish, dried vegetables, deals, and some flour. In the clandestine trade on the coasts of Spanish America, consisting wholly of goods manufactured by the nation, she commonly made a profit of 90 per cent, on the value of about 175,000 l. sent yearly to the caracas, or neighbouring colonies.

So many prosperous engagements brought immense sums into Martinitico. Upwards of 787,000 l. were constantly circulated in that island with great rapidity; and this is perhaps the only country in the world, where



Martinico.

where the specie has been so considerable as to make it a matter of indifference to them whether they dealt in gold, silver, or commodities. This extensive trade brought into the ports of Martinico annually 200 ships from France; 14 or 15 fitted out by the mother-country for the coast of Guinea, 60 from Canada, 10 or 12 from the islands of Margareta and Trinidad; besides the English and Dutch ships that came to carry on a smuggling trade. The private navigation from the island to the northern colonies, to the Spanish continent, and to the windward islands, employed 130 vessels from 20 to 30 tons burden.

The war of 1744 put a stop to this prosperity. Not that the fault was in Martinico itself; its navy, constantly exercised, and accustomed to frequent engagements, which the carrying on a contraband-trade required, was prepared for action. In less than six months, 40 privateers, fitted out at St Peter's, spread themselves about the latitude of the Caribbee islands. They signalled themselves in a manner worthy of the ancient freebooters; returning constantly in triumph, and laden with an immense booty. Yet, in the midst of these successes, an entire stop was put to the navigation of the colony, both to the Spanish coast, and to Canada, and they were constantly disturbed even on their own coasts. The few ships that came from France, in order to compensate the hazards they were exposed to by the loss of their commodities, sold them at a very advanced price, and bought them at a very low one. By this means the produce decreased in value, the lands were ill cultivated, the works neglected, and the slaves perishing for want.

When every thing thus seemed tending to decay, the peace at last restored the freedom of trade, and with it the hopes of recovering the ancient prosperity of the island. The event, however, did not answer the pains that were taken to attain it. Two years had not elapsed after the cessation of hostilities, when the colony lost the contraband-trade she carried on with the American Spaniards. This was owing to the substitution of register-ships to the fleets; and thus were the attempts of the smugglers confined within very narrow bounds. In the new system, the number of ships was undetermined, and the time of their arrival uncertain: which occasioned a variation in the price of commodities unknown before; and from that time the smuggler, who only engaged in this trade from the certainty of a fixed and constant profit, would no longer pursue it, when it did not secure him an equivalent to the risks he ran. But this loss was not so sensibly felt by the colony, as the hardships brought upon them by the mother-country. An unskilful administration clogged the reciprocal and necessary connection between the Islands and North-America with so many formalities, that in 1755 Martinico sent but four vessels to Canada. The direction of the colonies, now committed to the care of ignorant and avaricious clerks, soon lost its importance, sunk into contempt, and was prostituted to venality. The debts which had been contracted, during a series of calamities, had not yet been paid off, when the war broke out afresh. After a series of misfortunes and defeats, the island fell into the hands of the British. It was restored, however, in July 1763, 16 months after it had been conquered; but deprived of all the necessary means of pro-

Martinico.

sperty, that had made it of so much importance. For some years past, the contraband-trade carried on to the Spanish coasts was almost entirely lost. The cession of Canada had precluded all hopes of opening again a communication, which had only been interrupted by temporary mistakes. The productions of the Grenades, St Vincent, and Dominica, which were now become British dominions, could no longer be brought into their harbours; and a new regulation of the mother-country, which forbade her having any intercourse with Guadalupe, left her no hopes from that quarter.

The colony, thus deprived of every thing, as it were, and destitute, nevertheless contained, at the last survey, which was taken on the first of January 1770, in the compass of 28 parishes, 12,450 white people of all ages and of both sexes; 1814 free blacks or mulattoes; 70,553 slaves, and 443 fugitive negroes. The number of births in 1766, was in the proportion of one in 30 among the white people, and of one in 25 among the blacks. From this observation, if it were constant, it should seem that the climate of America is much more favourable to the propagation of the Africans than of the Europeans; since the former multiply still more in the labours and hardships of slavery, than the latter in the midst of plenty and freedom. The consequence must be, that in process of time the increase of blacks in America will surpass that of the white men; and, perhaps, at last avenge this race of victims on the descendants of the oppressors.

The cattle of the colony consists of 8283 horses or mules; 12,376 head of horned cattle; 975 hogs; and 13,544 sheep or goats.

Their provisions are, 17,930,596 trenches of cassava; 3,509,048 banana-trees; and 406 squares and a half of yams and potatoes.

Their plantations contain 11,444 squares of land, planted with sugar; 6,638,957 coffee-trees; 871,043 cocoa-trees; 1,764,807 cotton plants; 59,966 trees of cassia, and 61 of arnotto.

The meadows or savannahs take up 10,072 squares of land; there are 11,966 in wood, and 8448 uncultivated or forsaken.

The plantations which produce coffee, cotton, cocoa, and other things of less importance, are 1515 in number. There are but 286 for sugar. They employ 116 water-mills, 12 wind-mills, and 184 turned by oxen. Before the hurricane of the 13th of August 1766, there were 302 small habitations and 15 sugar-works more.

In 1769, France imported from Martinico, upon 202 trading vessels, 177,116 quintals of fine sugar, and 12,579 quintals of raw sugar; 68,518 quintals of coffee; 11,731 quintals of cocoa; 6048 quintals of cotton; 2518 quintals of cassia; 783 casks of rum; 307 hogheads of molasses; 150 pounds of indigo; 2147 pounds of preserved fruits; 47 pounds of chocolate; 282 pounds of rasped tobacco; 494 pounds of rope-yarn; 234 chells of liqueurs; 234 hogheads of molasses, &c. 451 quintals of wood for dyeing; and 12,108 hds in the hair. All these productions together have been bought in the colony itself, for 536,631l. 9s. 10d. It is true, that the colony has received from the mother-country to the amount of 588,412l. 16s. 6d. of merchandise; but part of

this

**Martínico.** this has been sent away to the Spanish coasts, and another part has been conveyed to the English settlements.

The island is 16 leagues in length and 45 in circumference, leaving out the capes, some of which extend two or three leagues into the sea. It is very uneven, and intersected in all parts by a number of hillocks; which are mostly of a conical form. Three mountains rise above these smaller eminences. The highest bears the indelible marks of a volcano. The woods with which it is covered, continually attract the clouds, which occasions noxious damps, and contributes to make it horrid and inaccessible; while the two others are in most parts cultivated. From these mountains issue the many springs that water the island. These waters which flow in gentle streams, are changed into torrents on the slightest storm. Their qualities are derived from the soil over which they flow. In some places they are excellent, in others so bad, that the inhabitants are obliged to drink the water they have collected during the rainy season.

Of all the French settlements in the West Indies, Martinico is the most happily situated with regard to the winds which prevail in those seas. Its harbours possess the inestimable advantage of affording a certain shelter from the hurricanes which annoy these latitudes. The harbour of Fort Royal, is one of the best in all the windward islands; and so celebrated for its safety, that, when it was open to the Dutch, their shipmasters had orders from the republic to take shelter there in June, July, and August, the three months in which the hurricanes are most frequent. The lands of the Lamentin, which are but a league distant, are the richest and most fertile in the whole island. The numerous streams which water this fruitful country, convey loaded canoes to considerable distance from the sea. The protection of the fortifications secured the peaceable enjoyment of so many advantages; which, however, were balanced by a swampy and unwholesome soil. This capital of Martinico was also the rendezvous of the men of war; which branch of the navy has always oppressed the merchantmen. On this account, Fort Royal was an improper place to become the centre of trade, and was therefore removed to St Peter's. This little town, notwithstanding the fires that have four times reduced it to ashes, still contains 1700 houses. It is situated on the western coast of the island, on a bay, or inlet, which is almost circular. One part of it is built on the strand along the sea-side, which is called the *anchorage*; and is the place destined for ships and ware-houses. The other part of the town stands upon a low hill: it is called the *Fort*, from a small fortification that was built there in 1665, to check the seditions of the inhabitants against the tyranny of monopoly; but it now serves to protect the road from foreign enemies. These two parts of the town are separated by a rivulet.

The anchorage is at the back of a pretty high and steep hill. Shut up as it were by this hill, which intercepts the easterly winds, the most constant and most salubrious in these parts; exposed, without any refreshing breezes, to the scorching beams of the sun, reflected from the hill, from the sea, and the black sand on the beach; this place is extremely hot, and always unwholesome. Besides, there is no harbour; and the

ships which cannot winter safely upon this coast are obliged to take shelter at Fort-Royal. But these disadvantages are compensated by the convenience of the road of St Peter's, for loading and unloading of goods; and by its situation, which is such that ships can freely go in and out at all times and with all winds.

**MARTLETS**, in heraldry, little birds represented without feet; and used as a difference or mark of distinction for younger brothers, to put them in mind that they are to trust to the wings of virtue and merit, in order to raise themselves, and not to their feet, they having little land to set their foot on. See **HERALDRY**, Art. 2. p. 3585.

**MARTYNA**, in botany, a genus of the angiospermia order, belonging to the didynamia class of plants. There are two species; both of them tender, herbaceous, showery plants of South America; one of them an annual, the other a perennial, rising with erect stalks, from a foot, to two feet high, garnished with oblong simple leaves, and terminated by short spikes of large monopetalous, bell-shaped flowers, of blue and purple colours. They flower in July and August, and are very ornamental, but require always to be kept in the hottest part of the stove.

**MARTYR**, is one who lays down his life, or suffers death, for the sake of his religion. The word is Greek, *μαρτυρ*, and properly signifies a "witness." It is applied, by way of eminence, to those who suffer in witness of the truth of the gospel.

The Christian church has abounded in martyrs, and history is filled with surprising accounts of their singular constancy and fortitude under the cruellest torments human nature was capable of suffering. The primitive Christians were accused by their enemies of paying a sort of divine worship to the martyrs. Of this we have an instance in the answer of the church of Smyrna to the suggestion of the Jews, who, at the martyrdom of Polycarp, desired the heathen judge not to suffer the Christians to carry off his body, lest they should leave their crucified master, and worship him in his stead. To which they answered, "We can neither forsake Christ, nor worship any other: for we worship him as the Son of God; but love the martyrs as the disciples and followers of the Lord, for the great affection they have shewn to their King and Master." A like answer was given at the martyrdom of Fructuosus in Spain. For when the judge asked Eulogius, his deacon, Whether he would not worship Fructuosus? as thinking, that, tho' he refused to worship the heathen idols, he might yet be inclined to worship a Christian martyr; Eulogius replied, "I do not worship Fructuosus, but him whom Fructuosus worships." The primitive Christians believed, that the martyrs enjoyed very singular privileges; that upon their death they were immediately admitted to the beatific vision, while other souls waited for the completion of their happiness till the day of judgment; and that God would grant chiefly to their prayers the hastening of his kingdom, and shortening the times of persecution.

The churches built over the graves of the martyrs, and called by their names, in order to preserve the memory of their sufferings, were distinguished by the title *martyrium confessorii*, or *memoria*.

The festivals of the martyrs are of very ancient date in the Christian church, and may be carried back at

**MARTYR** least till the time of Polycarp, who suffered martyrdom about the year of Christ 168. On these days the Christians met at the graves of the martyrs, and offered prayers and thanksgivings to God for the examples they had afforded them: they celebrated the eucharist, and gave alms to the poor; which, together with a panegyric oration or sermon, and reading the acts of the martyrs, were the spiritual exercises of these anniversaries.

**MARTYR** (Peter), a famous divine, born at Florence in 1500. He studied philosophy and the tongues at Padua and Bononia, was a regular Augustine in the monastery of Fiesoli, and was counted one of the best preachers in Italy. Zuinglius and Bucer's writings gave him a good opinion of the Protestants, and his conversation with Valdes confirmed it. He preached that doctrine at Rome in private; but, being impeached, fled to Naples, and thence to Lucca, where he brought over to the Protestant interest Emanuel Tremellius, Celsus Martinengus, Paul Lascius, and Jeremiah Zanchy. He was sent for to England by king Edward VI. and made professor of divinity at Oxford in 1549. In queen Mary's reign he returned to Strasburg, and was present at the conference of Poissy. His sentiments were not the same with Calvin's about Christ's presence in the eucharist. He wrote a great number of works, and died in 1562.

**MARTYROLOGY**, in the church of Rome, is a catalogue or list of martyrs, including the history of their lives and sufferings for the sake of religion. The term comes from *μάρτυρ*, "witness," and *λογία*, "dico," or *λογία*, "colloquio."

The martyrologies draw their materials from the calendars of particular churches, in which the several festivals dedicated to them are marked; and which seem to be derived from the practice of the ancient Romans, who inserted the names of heroes and great men in their fasti, or public registers.

The martyrologies are very numerous, and contain many ridiculous and even contradictory narratives; which is easily accounted for, if we consider how many forged and spurious accounts of the lives of saints and martyrs appeared in the first ages of the church, which the legendary writers afterwards adopted without examining into the truth of them. However, some good good critics, of late years, have gone a great way towards clearing the lives of the saints and martyrs from the monstrous heap of fiction they laboured under. See the article **LEGEND**.

**MARVELL** (Andrew), an ingenious writer in the 17th century, was bred at Cambridge. He travelled thro' the most polite parts of Europe, and was secretary to the embassy at Constantinople. His first appearance in public business at home was as assistant to Mr John Milton Latin secretary to the protector. A little before the restoration, he was chosen by his native town, Kingston upon Hull, to sit in that parliament, which began at Westminster April 25th 1660; and is recorded as the last member of parliament who received the wages or allowance anciently paid to representatives by their constituents. He seldom spoke in parliament, but he had great influence without doors upon the members of both houses; and prince Rupert had always the greatest regard for his advice. He made himself very obnoxious to the government by his ac-

tions and writings; notwithstanding which, king Charles II. took great delight in his conversation, and tried all means to win him over to his side, but in vain; nothing being ever able to shake his resolution. There were many instances of his firmness in resisting the offers of the court; but he was proof against all temptations. The king having one night entertained him, sent the Lord treasurer Danby the next morning to find out his lodgings; which were then up two pair of stairs in one of the little courts in the Strand. He was busy writing, when the treasurer opened the door abruptly upon him. Surprised at the sight of so unexpected a visitor, Mr Marvell told his Lordship, "That he believed he had mistaken his way." Lord Danby replied, "Not, now I have found Mr Marvell:" telling him he came from his Majesty, to know what he could do to serve him. Coming to a serious explanation, he told the Lord-treasurer, that he knew the nature of courts full well; that whoever is distinguished by a prince's favour, is certainly expected to vote in his interest. The Lord Danby told him, that his Majesty had only a just sense of his merits, in regard to which he only desired to know if there was any place at court he could be pleased with. These offers, though urged with the greatest earnestness, had no effect upon him. He told the Lord-treasurer, that he could not accept of them with honour; for he must be either ungrateful to the king in voting against him, or false to his country in giving into the measures of the court. The only favour therefore he had to request of his Majesty was, that he would esteem him as dutiful a subject as any he had, and more in his proper interest by refusing his offers, than if he had embraced them. The Lord Danby finding no arguments could prevail, told him, that the king had ordered a thousand pounds for him, which he hoped he would receive till he could think what farther to ask of his Majesty. The last offer was rejected with the same steadfastness of mind as the first; though, as soon as the Lord-treasurer was gone, he was forced to send to a friend to borrow a guinea. He died, not without strong suspicions of his being poisoned, in 1678, in the 58th year of his age. In 1688, the town of Kingston upon Hull contributed a sum of money to erect a monument over him in the church of St Giles in the Fields, where he was interred, and an epitaph composed by an able hand; but the minister of that church forbid both the inscription and monument to be placed there. He wrote many ingenious pieces; as, *The Rehearsal transposed*; *A short historical Essay concerning General Councils, Creeds, and Impositions in matters of Religion, &c.*

**MARVEL** of Peru, in botany. See **MIRABILIS**.

**MARY** I. of England, daughter of Henry VIII. by Catharine of Spain, queen and tyrant of England, succeeded her half-brother Edward VI. in 1553. If she had been educated in Spain, and an inquisitor had been her preceptor, she could not have imbibed more strongly the bloody principles of Romish persecution; and to the eternal disgrace of the English prelacy, though the reformation had taken root in both universities, she found English bishops ready to carry her cruel designs to subvert it, into effectual execution. Upon her accession to the throne, she declared, in her speech to the council, that she would not persecute her

Marvell,  
Mary.



Mary.

Protestant subjects; but in the following month, she prohibited preaching without a special licence: before the expiration of three months, the Protestant bishops were excluded the house of lords, and all the statutes of Edward VI. respecting the Protestant religion were repealed; and before she had enjoyed the crown a year, archbishop Cranmer, who had saved her life when her father had resolved to take off her head, and the bishops Ridley and Latimer, were condemned for heresy at Oxford, and afterwards burnt. In 1556, the persecution became general; and Protestants of all ranks and ages, and of both sexes, fell victims to papal fury. It is observable, likewise, that the same perfidious violation of promises and treaties prevailed in the queen's council, with respect to public affairs. By the treaty of marriage concluded between the queen and Philip prince of Spain, son of the famous emperor Charles le Quint, in 1554, it was expressly stipulated, that England should not be engaged in any wars with France on account of Spain; yet in 1557, Philip, who had brought immense sums of money into England, procured an offensive and defensive alliance against France, from the English administration, and 8000 of the queen's choicest troops were sent over to the assistance of the Spaniards in the Low Countries: the loss of Calais to the French was the first fruit of this war; and some assert, that upon this single occasion the queen shewed a strong attachment to her native country, lamenting this stroke so deeply, that it occasioned her death; but it is better authenticated, that she was carried off by an epidemic fever, which raged so violently that it did not leave a sufficient number of men in health to get in the harvest. She died in 1558, in the 43d year of her age, and sixth of her reign.

MARY of Medicis, wife of Henry IV. king of France, was declared sole regent of the kingdom in 1610, during the consecration which the assassination of that beloved king had occasioned. By her ambitious intrigues, the nation lost all its influence abroad, and was torn to pieces at home by contending factions. After several vicissitudes of fortune, she was abandoned by her son Lewis XIII. whose reign had been constantly disturbed by the civil commotions she had occasioned; and died in indigence at Brussels, in 1642, aged 68. She built the superb palace of Luxembourg at Paris, and embellished that city with aqueducts and other ornaments.

MARY, queen of Scotland, daughter of James V. was born in December 1542. Her father dying a few days after her birth, the scarce existed before she was hailed queen of Scotland. Violent were the disputes among the nobility, who should obtain the guardianship of her infant majesty, and government of the kingdom. It was however at length adjudged to the earl of Arran, as the heir-apparent and first peer of the realm. Whilst yet in her infancy, Henry VIII. of England demanded her in marriage for his son Ed-

ward; but her guardian refused his consent, and the famous battle of Muffelburgh was the consequence. The Scots being defeated, she was conveyed by the queen-mother to the Isle of Inchmahom; where, we are told, she was instructed in the Latin, French, Spanish, and Italian languages.

At six years old she was sent to France; where, after continuing a few days with the king and queen, she was removed to a monastery, and was there educated with the daughters of the French nobility. In this seminary she acquired a taste for poetry, and also became a notable proficient in music, dancing, and the art of sitting gracefully on horseback; but needle-work was her favourite amusement, in which she particularly excelled (A). On the 20th of April, 1558, she was married to the young dauphin; who dying in December 1560, she returned to her native country. She had not been long in Scotland, before she received proposals of marriage from Charles, archduke of Austria. Queen Elizabeth of England disapproved the match; and recommended Henry Stuart, Lord Darnley, son to the earl of Lenox. To this nobleman she gave her hand; and by him she had one son, James I. of England. They had not been many months married before Darnley was barbarously murdered; and, in three months after, the espoused earl of Bothwell, a man of no estimation, and who is generally supposed to have been the murderer of her late husband. From that fatal moment her life was a continued series of misfortunes: Scotland became a scene of confusion; her subjects rebelled; her husband fled to Denmark; and she herself was made a prisoner, and treated with the utmost indignity. She found means to escape from the persecution of her subjects, and fled to England for safety: but she was too beautiful to find a friend in Elizabeth; who, with constant professions of esteem, after keeping her in confinement during 18 long years, at last brought her head to the block.

The fair heroine received her sentence of death with great composure; wrote her will the day before her execution; for which, on the succeeding morn, she prepared with religious solemnity, and perfect resignation. She was executed on the 8th of February 1587, in the 46th year of her age, in the castle of Fotheringhay, where she had been long confined, and on the first of August was interred in the cathedral church at Peterborough, with great pomp. Twenty-five years after, her remains were, by order of her son king James I. removed to Henry VII.'s chapel in Westminster abbey, and a magnificent monument erected to her memory. See (History of) SCOTLAND.

She wrote, 1. Poems on various occasions, in the Latin, French, and Scotch languages. One of her poems is printed among those of A. Blackwood; another in Brantome's *Dames illustres*, written on the death of her first husband Francis. 2. Consolation of her long imprisonment, and royal advice to her son.

2

25 H 2

3. A

(A) An impalement of the arms of France and Scotland, embroidered under an imperial crown, on the valence of the canopy in the presence-chamber at Whitehall, as said to be chiefly her performance. *Sandf. Gen. Hist.* p. 529.

Embroidery probably made a considerable part of her employment during her tedious imprisonment, the last almost 20 years of her life; for one of her historians informs us, that about the year 1579, she sent, with other presents, to her son, a magnificent state-bed, "one of the most curious pieces of workmanship that that or any age has produced, embroidered with gold and silk, designed and finished all by her own hand." The principal figures, 29 in number, were emblematical, with Latin mottoes, alluding to her unhappy situation, and the separate arms of England, Scotland, and France. See *Mackenzie's Lives*, vol. iii. p. 328.

Mary.

Mary.  
Maryland.

3. A copy of verses, in French, sent with a diamond-ring to queen Elizabeth. There is a translation of these verses among the Latin poems of Sir Thomas Chaloner. 4. Genuine Letters of Mary queen of Scots, to James earl of Bathew; translated from the French, by E. Simmonds, 1726. There are, besides, many other of her epistles to queen Elizabeth, secretary Cecil, Mildmaye, &c. which are preserved in the Cotton, Ashmolean, and other libraries.

MARY II. queen of England, eldest daughter of James II. by his first wife, was born at St James's in 1662. She was bred up a Protestant, and married to the illustrious William Henry of Nassau, then prince of Orange, afterward king of England, in the 16th year of her age. She staid in Holland with her husband till February 12, 1689, when she came over, and was solemnly proclaimed queen of England, &c. She was an equal sharer with her royal husband in all the rights belonging to the crown; but the administration and execution thereof was lodged solely in the king. She was a princess endowed with the highest perfections both of body and mind: she loved history, as being proper to give her useful instructions; and was also a good judge as well as a lover of poetry. She studied more than could be imagined, and would have read more than she did, if the frequent returns of ill-humours in her eyes had not forced her to spare them. She gave her minutes of leisure to architecture and gardening; and since it employed many hands, she said, she hoped it would be forgiven her. She was the most gracious of sovereigns to her subjects, and the most obliging of wives to her husband, as well as the most excellent of mistresses to her servants: she ordered good books to be laid in the places of attendance, that persons might not be idle while they were in their turns of service. She was exceeding zealous for a reformation of manners; charitable in the highest degree, without the least ostentation. This excellent queen died on the 28th of December 1695, at Kensington, of the small-pox, in the 33d year of her age. In her arts lost a protectress, the unfortunate a mother, and the world a pattern of every virtue. As to her person, she was tall, of a majestic graceful mien, her countenance serene, her complexion ruddy, and her features beautiful.

MARY Magdalen's Day, a festival of the Romish church, observed on the 22d of July.

MARYGOLD. See CALTHA.

Corn MARYGOLD. See CHRYSANTHEMUM.

French MARYGOLD. See TAGETES.

MARYLAND, one of the British colonies in North America. It received that name in honour of Henrietta Maria the consort of king Charles I. who made a grant of this country, with very extraordinary powers, to Lord Baltimore. It lies between 38 and 40 degrees north latitude, and in longitude from 74 to 78 degrees west from London. It is in length about 140 miles, but not quite so much in breadth. It is bounded on the north by Pennsylvania; on the east by the lower counties of the same colony, and by the Atlantic; on the south by Chesapeake Bay; on the west by the river Potomack, and the province of Virginia. The climate may be well styled mild and pleasant: for though the winters are cold, they are short; and the heat of their summers is tempered by cool

breezes from the bay before-mentioned, which is one of the finest in the world. The country, except towards the north, is in general a flat open plain, of a deep rich soil, and very very fertile. It produces grain of all sorts, rich fruits of different kinds, timber, hemp, flax, and in the bowels of the earth there is great plenty of iron ore. The staple of this country is tobacco, of which hitherto they have raised immense quantities, though some say their lands begin to wear out, which obliges them to keep great numbers of cattle for the sake of manure. They likewise export lumber, naval stores, &c. The situation of this country and the nature of its staple prevent the building of towns; for the plantations lying on the banks of their numerous navigable rivers, their vessels come up to the planters doors, and their tobacco is consequently laden without trouble. Their custom-houses are on the rivers Pocomoke, Chester, Patuxint, and the north-side of Potomack. They have however one town, Annapolis, which is the seat of government, and tho' small is one of the fairest and best-built in America. The number of inhabitants exceeds 100,000; of which, however, three-fifths are negro-slaves; the remainder whites, who live in general much at their ease.

The patent which had been promised to Sir George Calvert of this part of what was then styled Virginia was granted to his son Cecilius, created lord Baltimore, and bears date 20th of June 1632. He sent over his brother Leonard Calvert, Esq; with 200 gentlemen and persons of some property to settle there. His son Charles Calvert was afterwards governor for near 20 years, and under their administration the colony flourished exceedingly. They made themselves so acceptable to the Indians at their first coming, that they yielded to them half, and as soon as their harvest was over their whole town; and this good understanding constantly subsisted. By means of a general toleration of all Christians, the number of inhabitants was much increased. The government, before the American revolt, was on much the same plan with the rest; for it behoved the deputy-governor, though appointed by the proprietor, to be approved of by the crown. He had a council and an assembly, but the laws made therein were not transmitted to England. The culture of tobacco made negroes necessary; this is of a particular kind called *oronomo*, or as some write it *aranoko*, which is hotter than what is made in Virginia, and less acceptable here, but sells better in the eastern and northern parts of Europe. The inhabitants carry on a considerable trade to Great Britain, as well as to the southern parts of Europe, the French and British West Indies, and the continent of America. They have also some intercourse with the coasts of Africa. The total of their exports, A. D. 1769, amounted to 350,097 l. In A. D. 1770, there were entered inward ships 205, sloops 197; cleared outwards, ships 228, sloops 172.

MAS PLANTA, a plant which upon the same root produces male flowers only. See MASCULUS *Flos*.

MASAFUERO, an island of the South-Sea, lying in S. Lat. 33. 45. W. Long. 80. 46. It is very high and mountainous, and at a distance seems to consist of one hill or rock. It is of a triangular form, and seven or eight leagues in circumference. There is

Maryland.  
Masafuero.

such

**Masculine.** such plenty of fish, that a boat with a few hooks and lines may very soon catch as many as will serve 100 people. Here are coal-fish, cavilliers, cod, hallibut, and cray-fish. Captain Carteret's crew caught a king-fisher that weighed 87 pounds, and was five feet and an half long. The sharks were here so ravenous, that, in taking soundings, one of them swallowed the lead, by which they hauled him above water; but he regained his liberty, by disgorging his prey. Seals are so numerous here, that captain Carteret says, if many thousands were killed in a night, they would not be missed next morning. These animals yield excellent train-oil; and their hearts and plucks are very good food, having a taste something like those of a hog; their skins are covered with a very fine fur. There are many birds here, and some very large hawks. Of the pintado bird one ship caught 700 in one night. Commodore Byron landed here with difficulty in 1765, in order to take in wood and water, of both which he found plenty. He found also great numbers of goats, whose flesh tasted as well as venison in England.

**MASCU LINE**, something belonging to the male, or the stronger of the two sexes. See **MALE**.

**MASCU LINE**, is more ordinarily used in grammar to signify the first and worthiest of the genders of nouns. See **GENDER**.

The masculine gender is that which belongs to the male kind, or something analogous to it.

Most substantives are ranged under the heads of masculine or feminine.—This, in some cases, is done with a show of reason; but in others is merely arbitrary, and for that reason is found to vary according to the languages and even according to the words introduced from one language into another.—Thus the names of trees are generally feminine in Latin, and masculine in the French.

Farther, the genders of the same word are sometimes varied in the same language. Thus *alvus*, according to Priscian, was anciently masculine, but is now become feminine. And *navire*, a ship, in French, was anciently feminine, but is now masculine.

**MASCU LINE Rhyme**, in the French poetry, is that made with a word which has a strong, open, and accented pronunciation; as all words have, excepting those which have an *e* feminine in their last syllable. See **RHYME**.

For instance, *amour* and *jour*, *mort* and *sirt*, are masculine rhymes:—and *pere* and *mere*, *gloire* and *memoire*, are feminine. Hence also verses ending with a masculine rhyme, are called *masculine verses*, and those ending with a feminine rhyme, *feminine verses*. See **VERSE**.

It is now a rule established among the French poets never to use the above two masculine or two feminine verses successively, except in the looser kind of poetry.

Marot was the first who introduced this mixture of masculine and feminine verses, and Ronfard was the first who practised it with success. The masculine verses should always have a syllable less than the feminine ones.

**MASCU LINE Signs**.—Astrologers divide the signs into masculine and feminine; by reason of their qualities, which are either active, and hot, or cold, accounted masculine; or passive, dry, and moist, which

are feminine.

On this principle they call the *sun*, *Jupiter*, *Saturn*, and *Mars*, masculine; and the moon and Venus, feminine. Mercury, they suppose, partakes of the two. Among the signs, Aries, Libra, Gemini, Leo, Sagittarius, Aquarius, are masculine: Cancer, Capricornus, Taurus, Virgo, Scorpio, and Pisces, are feminine.

**MASCU LUS FLOS**, a male flower; a flower which contains the stamina, reckoned by the sexualists the male organ of generation, but not the stigma or female organ.

All the plants of the class *diœcia* of Linnæus have male and female flowers upon different roots: those of the class *monœcia*, bear flowers of different sexes on the same root. The plants, therefore, of the former are only male or female: those of the latter are androgynous; that is, contain a mixture of both male and female flowers.

**MASH**, a drink given to a horse, made of half a peck of ground malt put into a pail, into which as much scalding hot water is poured as will wet it very well: when that is done, stir it about, till, by tasting, you find it as sweet as honey; and when it has stood till it is lukewarm, it is to be given to the horse. This liquor is only used after a purge, to make it work the better; or after hard labour, or instead of drink in the time of any great sickness.

**MASILLON** (John Baptist) bishop of Clermont, and one of the most eloquent preachers of his time, was born at Hieres, in Provence, in 1663, and died in 1742. His sermons and other works are published in 14 vols 12mo.

**MASINISSA**, king of a small territory in Africa, at first an enemy to the Romans, and ally of the Carthaginians: but Scipio having taken his nephew prisoner, sent him home, accompanied by an honourable escort, and laden with presents; which gave him so high an opinion of the generosity of the Romans, that he went over to them, and assisted them in their conquests in Africa. He was a renowned warrior, and left 44 children, most of whom became illustrious in history.

**MASON**, a person employed under the direction of an architect, in the raising of a stone-building.

The chief business of a mason is to make the mortar; raise the walls from the foundation to the top, with the necessary retreats and perpendiculars; to form the vaults, and employ the stones as delivered to him. When the stones are large, the business of hewing or cutting them belongs to the stone-cutters, tho' these are frequently confounded with masons: the ornaments of sculpture are performed by carvers in stones or sculptors. The tools or implements principally used by them are the square, level, plumb-line, bevel, compass, hammer, chissel, mallet, saw, trowel, &c. See **SQUARE**, &c.

Besides the common instruments used in the hand, they have likewise machines for raising of great burdens, and the conducting of large stones, the principal of which are the lever, pulley, wheel, crane, &c. See **LEVER**, &c.

*Free and Accepted MASONS*, a very ancient society or body of men; so called, either from some extraordinary knowledge of masonry or building, which they

Masculus  
Mafon.



**Masonry.** are supposed to be masters of, or because the first founders of the society were persons of that profession. These are now very considerable, both for number and character, being found in every country in Europe, and consisting principally of persons of merit and consideration. As to antiquity, they lay claim to a standing of some thousand years. What the end of their institution is, seems still in some measure a secret; and they are said to be admitted into the fraternity by being put in possession of a great number of secrets, called the *mason's word*, which have been religiously kept from age to age, being never divulged.

**MASONRY**, in general, a branch of architecture, consisting in the art of hewing or squaring stones, and cutting them level or perpendicular, for the uses of building: but, in a more limited sense, masonry is the art of assembling and joining stones together with mortar.

Hence arise as many different kinds of masonry, as there are different forms and manners for laying or joining stones. Vitruvius mentions several kinds of masonry used among the ancients: three of hewed stone, viz. that in form of a net, that in binding, and that called the *Greek masonry*; and three of unhewed stones, viz. that of an equal course, that of an unequal course, and that filled up in the middle; and the seventh was a composition of all the rest.

Net-masonry, called by Vitruvius *reticulatum*, from its resemblance to the meshes of a net, consists of stones squared in their courses, and so disposed as that their joints go obliquely; and their diagonals are the one perpendicular, and the other level. This is the most agreeable masonry to the eye, but it is very apt to crack. See n° 1.

Bound masonry, that in which the stones were placed one over another, like tiles; the joints of their beds being level, and the mounters perpendicular, so that the joint that mounts and separates two stones, always falls directly over the middle of the stone below. This is less beautiful than the net-work; but it is more solid and durable. See n° 2.

Greek masonry, according to Vitruvius, is that where after we have laid two stones, each of which makes a course, another is laid at the end, which makes two courses, and the same order is observed throughout the building; this may be called *double-binding*, in regard the binding is not only of stones of the same course with one another, but likewise of one course with another course. See n° 3.

Masonry by equal courses, called by the ancients *isodolum*, differs in nothing from the bound masonry, but only in this, that its stones are not hewn. See n° 4.

Masonry by unequal courses, called *pseuðisodolum*, is also made of unhewed stones, and laid in bound work; but then they are not of the same thickness, nor is there any equality observed excepting in the several courses, the courses themselves being unequal to each other. See n° 5.

Masonry filled up in the middle, is likewise made unhewed stones, and by courses; but the stones are only set in order as to the courses, See n° 9. A, the courses; B, the parts filled up; C, a coat of plaster.

Compound masonry is of Vitruvius's preposings, so called as being formed of all the rest. In this the courses are of hewed stone; and the middle being left void, is filled up with mortar and pebbles thrown in together: after this the stones of one course are bound to those of another course with cramp-irons fastened with melted lead. See n° 7. E, the stones cramped; F, the cramps; G, the middle part filled up.—N° 8. represents another sort of compound masonry, the middle of which is stone, and the edges boards.

All the kinds of masonry now in use may be reduced to these five, viz. bound masonry; that of brick-work, where the bodies and projectures of the stones inclose square spaces or panels, &c. set with bricks; that de moilon, or small work, where the courses are equal, well squared, and their edges or beds rusticated; that where the courses are unequal; and that filled up in the middle with little stones and mortar.

**MASS**, in mechanics, the matter of any body cohering with it, i. e. moving and gravitating along with it. In which sense, *mass* is distinguished from bulk, or volume, which is the expansion of a body in length, breadth, and thickness.

The mass of any body is rightly estimated by its weight. And the masses of two bodies of the same weight are in a reciprocal ratio of their bulks.

**MASS**, *Missa*, in the church of Rome, the office or prayers used at the celebration of the eucharist; or in other words, consecrating the bread and wine into the body and blood of Christ, and offering them so transubstantiated as an expiatory sacrifice for the quick and the dead.

As the mass is in general believed to be a representation of the passion of our blessed Saviour, so every action of the priest, and every particular part of the service, is supposed to allude to the particular circumstances of his passion and death.

Nicod, after Baronius, observes that the word comes from the Hebrew *missach*, (*oblatum*;) or from the Latin *missa*, *missum*; because in the former times, the catechumens and excommunicated were sent out of the church, when the deacons said, *Ite, missa est*, after sermon and reading of the epistle and gospel; they not being allowed to assist at the consecration. Menage derives the word from *missio*, "dismissing;" Others from *missa*, "missing, sending;" because in the mass, the prayers of men on earth are sent up to heaven.

The general division of masses consists in high and low. The first is that sung by the choristers, and celebrated with the assistance of a deacon and sub-deacon: low masses are those in which the prayers are barely rehearsed without singing.

There are a great number of different or occasional masses in the Romish church, many of which have nothing peculiar but the name: such are the masses of the saints; that of St Mary of the snow, celebrated on the fifth of August; that of St Margaret, patroness of lying-in women; that of the feast of St John the Baptist, at which are said three masses; that of the Innocents, at which the *gloria in excelsis*, and the *hallelujah* are omitted, and it being a day of mourning, the altar is of a violet-colour. As to ordinary masses



Fig. 1.  
MANTIS SICIFOLIA,  
or walking leaf.



MAST.

Fig. 2.



Fig. 6.

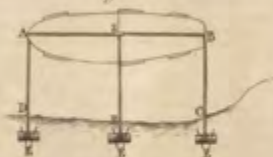


Fig. 2.



Fig. 3.



Fig. 3.



Fig. 4.





Maf.  
Maffilia.

maſſes, ſome are ſaid for the dead, and, as is ſuppoſed, contribute to fetch the ſoul out of purgatory : at theſe maſſes the altar is put in mourning, and the only decorations are a croſs in the middle of fix yellow wax-lights; the drels of the celebrant, and the very maſs-book, are black; many parts of the office are omitted, and the people are diſmiſſed without the benediction. If the maſs be ſaid for a perſon diſtinguiſhed by his rank or virtues, it is followed with a funeral oration : they erect a *chapelle ardente*, that is a representation of the deceaſed with branches and tapers of yellow wax, either in the middle of the church or near the deceaſed's tomb, where the prieſt pronounces a ſolemn abſolution of the deceaſed. There are likewiſe private maſſes, ſaid for ſtolen or ſtrayed goods or cattle, for health, for travellers, &c. which go under the name of *votive maſſes*. There is ſtill a further diſtinction of maſſes denominated from the countries in which they were uſed; thus the Gothic maſs, or *miſſa moſarabum*, is that uſed among the Goths when they were maſters of Spain, and which is ſtill kept up at Toledo and Salamanca; the Ambroſian maſs is that compoſed by St Ambroſe, and uſed only at Milan, of which city he was biſhop; the Gallic maſs, uſed by the ancient Gauls; and the Roman maſs, uſed by almoſt all the churches in the Romiſh communion.

*Maſs of the Preſanctified*, (*miſſa preſanctificatorum*.) is a maſs peculiar to the Greek church, in which there is no conſecration of the elements; but after ſinging ſome hymns, they receive the bread and wine which was before conſecrated. This maſs is performed all Lent, except on Saturdays, Sundays, and the annunciation. The prieſt counts upon his fingers the days of the enſuing week on which it is to be celebrated, and cuts off as many pieces of bread at the altar as he is to ſay maſſes; and after having conſecrated them, ſleeps them in wine, and then puts them in a box; out of which, upon every occaſion, he takes ſome of it with a ſpoon, and putting it on a diſh ſets it upon the altar.

MASSA, a town of Italy, in the kingdom of Naples, and in the Terra di Lavoro, with a biſhop's ſee; ſeated on a mountain near the ſea, in E. Long. 10. o. N. Lat. 43. 5.

MASSA, an ancient, populous, and handſome town of Italy, and capital of a ſmall territory of the ſame name, with the title of a principality, and a ſtrong caſtle. It is famous for its quarries of fine marble, and is ſituated in E. Long. 14. 23. N. Lat. 40. 40.

MASSACHUSETTS COLONY, the principal ſubdiviſion of New England, having Hampſhire on the north, the Atlantic ocean on the eaſt and ſouth, and Connecticut and New-York on the weſt. It is about 100 miles long and 40 broad. See *New-England*.

MASSALIANS, a ſet of enthuſiaſts who ſprang up about the year 361, in the reign of the emperor Conſtantius, who maintained that men have two ſouls, a celeſtial and a diabolical, and that the latter is driven out by prayer.

MASSILIA, (anc. geog.), a town of Gallia Narbonenſis; a colony of Phocæans, from Phocæa, a city of Ionia, and in confederacy with the Romans: univerſally celebrated not only for its port, commerce, and

ſtrength, but eſpecially for its politeneſs of manners and its learning. It was the ſchool for barbarians, who were excited by its means to ſuch a fondneſs for Greek literature, that even their public and private tranſactions were all executed in that language, according to Strabo; who adds, "At this day the nobleſt Romans repair thither for ſtudy, rather than to Athens." See *Marseilles*, a city and port-town of Provence. Now MARSEILLES.

MASSIEU (William), a learned French writer, member of the academy of belles lettres, and of the French academy, was born at Caen in Normandy in 1665, and completed his ſtudies at Paris, when he entered amongſt the Jeſuits; but afterwards left them, that he might follow his inclination to polite literature with the greater freedom. In 1710 he was made Greek profeſſor in the royal college; and enjoyed that poſt till his death, which happened at Paris in 1722. He wrote, 1. Several curious diſſertations in the memoirs of the academy of inſcriptions. 2. A hiſtory of the French poetry, in 12mo, &c.

MASSINGER (Philip), an English dramatic poet, was born at Salisbury about the year 1581, and was educated at Oxford. He left the univerſity without taking any degree; and went to London to improve his poetical genius by polite converſation. There he wrote many tragedies and comedies, which were received with vaſt applauſe; and were greatly admired for the œconomy of the plots, and the purity of the ſtyle. He was at the ſame time a perſon of the moſt conſummate modeſty; which rendered him extremely beloved by the poets of his time, particularly by Fletcher, Middleton, Rowley, Field, and Decker, who thought it an honour to write in conjunction with him. He was as remarkable for his abilities as his modeſty. He died ſuddenly at his houſe on the Bank-ſide in Southwark, near the play-houſe; and was interred in St Saviour's church-yard, in the ſame grave with Mr Fletcher the poet.

MASSETER, in anatomy. See there, (*Table of the Muſcles*).

MASSIVE, among builders, an epithet given to whatever is too heavy and ſolid: thus a maſſive column is one too ſhort and thick for the order whole capital it bears; and a maſſive wall is one whole openings or lights are too ſmall in proportion.

MASSORA, in matters of literature, a critical work, containing remarks on the verſes, words, letters, and vowel-points of the Hebrew text of the Bible; a work more laborious than uſeful.

MAST, a long round piece of timber, elevated perpendicularly upon the keel of a ſhip, to which are attached the yards, the ſails, and the rigging. A maſt, with regard to its length, is either formed of one ſingle piece, which is called a *pole-maſt*, or compoſed of ſeveral pieces joined together, each of which retains the name of maſt ſeparately. The loweſt of theſe is accordingly named the *lower maſt*, *a*, fig. 2. the next in height is the top-maſt, *b*, which is erected at the head of the former; and the highſt is the top-gallant maſt, *c*, which is prolonged from the upper end of the top-maſt. Thus the two laſt are no other than a continuation of the firſt upwards.

The lower-maſt is fixed in the ſhip by an apparatus, de-

Maffieu  
||  
Maſt.

Plate  
CLXVI.

described in the articles *HULK* and *SHEERS*: the foot, or heel of it, rests in a block of timber called the *step*, which is fixed upon the *keelson*; and the top-mast is attached to the head of it by the *cap* and the *treffle-trees*. The latter of these are two strong bars of timber, supported by two prominences, which are as shoulders on the opposite sides of the mast, a little under its upper end; athwart these bars are fixed the *cross-trees*, upon which the frame of the top is supported. Between the lower mast-head and the foremast of the cross-trees, a square space remains vacant, the sides of which are bounded by the two treffle-trees. Perpendicularly above this is the foremast hole in the cap, whose after-hole is solidly fixed on the head of the lower-mast. The top mast is erected by a tackle, whose effort is communicated from the head of the lower mast to the foot of the top-mast; and the upper end of the latter is accordingly guided into and conveyed up through the holes between the treffle-trees and the cap, as above-mentioned. The machinery by which it is elevated, or, according to the sea phrase, *swayed up*, is fixed in the following manner: the top rope *d*, fig. 3. passing through a block *e*, which is hooked on one side of the cap, and afterwards through a hole, furnished with a sheave or pulley *f*, on the lower end of the top-mast, is again brought upwards on the other side of the mast, where it is at length fastened to an eye-bolt in the cap *g*, which is always on the side opposite to the top-block *e*. To the lower end of the top-rope is fixed the top-tackle *h*, the effort of which being transmitted to the top-rope *d*, and thence to the heel of the top mast *f*, necessarily lifts the latter upwards, parallel to the lower mast. When the top-mast is raised to its proper height, fig. 4. the lower end of it becomes firmly wedged in the square hole, above-described, between the treffle-trees. A bar of wood, or iron, called the *rid*, is then thrust through a hole *i* in the heel of it, across the treffle trees, by which the whole weight of the top-mast is supported.

In the same manner as the top-mast is retained at the head of the lower-mast, the top-gallant-mast is erected, and fixed at the head of the top-mast.

Besides the parts already-mentioned in the construction of masts, with respect to their length, the lower-masts of the largest ships are composed of several pieces united into one body. As these are generally the most substantial parts of various trees, a mast, formed by this assemblage, is justly esteemed much stronger than one consisting of any single trunk, whose internal solidity may be very uncertain. The several pieces are formed and joined together, as represented in the section of a lower mast of this sort, fig. 5. where *a* is the shaft, or principal piece into which the rest are fixed, with their sides or faces close to each other. The whole is secured by several strong hoops of iron, driven on the outside of the mast, where they remain at proper distances.

The principal articles to be considered in equipping a ship with masts are, 1st, the number; 2d, their situation in the vessel; and 3d, their height above the water.

The masts being used to extend the sails by means of their yards, it is evident, that if their number were multiplied beyond what is necessary, the yards must be extremely short, that they may not entangle each

other in working the ship, and by consequence their sails will be very narrow, and receive a small portion of wind. If, on the contrary, there is not a sufficient number of masts in the vessel, the yards will be too large and heavy, so as not to be managed without difficulty. There is a mean between these extremes, which experience and the general practice of the sea have determined; by which it appears, that in large ships every advantage of sailing is retained by three masts and a bowsprit.

The most advantageous position of the masts is undoubtedly that from whence there results an equilibrium between the resistance of the water on the body of the ship on one part, and of the direction of their effort on the other. By every other position this equilibrium is destroyed, and the greatest effort of the masts will operate to turn the ship horizontally about its direction; a circumstance which retards her velocity. It is counterbalanced indeed by the helm; but the same inconvenience still continues; for the force of the wind, having the resistance of the helm to overcome, is not entirely employed to push the vessel forward. The axis of the resistance of the water should then be previously determined, to discover the place of the *main-mast*, in order to suspend the efforts of the water equally, and place the other masts so as that their particular direction will coincide with that of the main mast. The whole of this would be capable of a solution if the figure of the vessel were regular, because the point, about which the resistance of the water would be in equilibrium, might be discovered by calculation.

But when the real figure of the ship is considered, these flattering ideas will instantly vanish. This observation induced M. Saverien to employ a mechanical method to discover the axis of resistance of the water, which he apprehended might be used with success in the manner following:

When the vessel is lanchd, before the places of the masts are determined, extend a rope A B, fig. 6. from the head to the stern. To the extremities A and B attach two other ropes, AD, BC, and apply to the other ends of these ropes two mechanical powers, to draw the ship according to the direction BC, parallel to itself. The whole being thus disposed, let a moveable tube Z, fixed upon the rope A B, have another rope ZR attached to it, whose other end communicates with a mechanical power R, equal to the two powers D and C. This last being applied to the same vessel, in such manner as to take off the effects of the two others by sliding upon the rope A B, so as to discover some point Z, by the parallelism of the ropes AD BC feebly extended with the rope ZR; the line ZR will be the axis of the equilibrium of the water's resistance, and by consequence the main-mast should be planted in the point Z.

The figures E, E, E, are three windlasses on the shore, by which this experiment is applied.

With regard to the situation of the other masts, it is necessary, in the same manner, to discover two points; so that the direction of the two mechanical powers operating, will be parallel to the axis of resistance RZ already found.

The exact height of the masts, in proportion to the form and size of the ship, remains yet a problem to be determined. The more the masts are elevated above the

Mast,  
Master.

the centre of gravity, the greater will be the surface of sail which they are enabled to present to the wind; so far an additional height seems to have been advantageous. But this advantage is diminished by the circular movement of the mast, which operates to make the vessel lurch to its effort; and this inclination is increased in proportion to the additional height of the mast, an inconvenience which it is necessary to guard against. Thus what is gained upon one hand is lost upon the other. To reconcile these differences, it is certain, that the height of the mast ought to be determined by the inclination of the vessel, and that the point of her greatest inclination should be the term of this height above the centre of gravity. See the article TRIM.

With regard to the general practice of determining the height of the masts, according to the different rates of the ships in the royal navy, the reader is referred to the article SAIL.

In order to secure the masts, and counterbalance the strain they receive from the effort of the sails impressed by the wind, and the agitation of the ship at sea, they are sustained by several strong ropes, extended from their upper ends to the outside of the vessel, called *shrouds*, as represented in fig. 4. They are further supported by other ropes, stretched from their heads towards the fore-part of the vessel.

The mast, which is placed at the middle of the ship's length, is called the *main-mast*; that which is placed in the forepart, the *fore-mast*; and that which is towards towards the stern, is termed the *mizen-mast*.

N. B. *Mizen* is applied to this mast by all the nations of Europe, except the French, who alone call the fore-mast *misaine*.

MASTER (MAGISTER), in general, is a title of authority, and applied to persons in various characters. It is also used as a compellation of respect.

MASTER of Arts, the first degree taken up in all foreign universities, but the second in those of England; candidates not being admitted to it in that country till they have studied in the university seven years.

MASTER of a Ship of War, an officer appointed by the commissioners of the navy to take charge of the navigating and conducting a ship from port to port, under the direction of the captain. The management and disposition of the sails, the working of the ship into her station in the order of battle, and the direction of her movements in the time of action and in the other circumstances of danger, are also more particularly under his inspection. It is likewise his duty to examine the provisions, and accordingly to admit none into the ship but such as are found, sweet, and wholesome. He is moreover charged with the *stowage*, or disposition of these materials in the ship's hold; and to enable him the better to perform these services, he is allowed several assistants, who are properly termed *mates* and *quarter masters*. See these articles.

MASTER of a Merchant-Ship, the commanding officer, who is appointed by the merchants to manage the navigation and every thing relating to her cargo, voyage, sailors, &c.

MASTER-Attendant, an officer in the royal dockyards, appointed to hasten and assist at the fitting out or dismantling, removing or securing vessels of

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war, &c. at the port where he resides. He is particularly to observe that his majesty's ships are securely moored; and for this purpose he is expected frequently to review the *moorings*, which are sunk in the harbour, and observe that they are kept in proper repair to be always ready when occasion requires. It is also his duty to visit all the ships in *ordinary*, and see that they are frequently cleaned and kept in order; and to attend at the general musters in the dockyards, taking care that all the officers, artificers, and labourers, registered in the navy-books, are present at their duty.

MASTER at Arms, an officer appointed to teach the officers and crew of a ship of war the exercise of small arms; to confine and plant centinels over the prisoners, and superintend whatever relates to them during their confinement. He is also to observe, that the fire and lights be all extinguished as soon as the evening gun is fired, except those which are permitted by proper authority or under the inspection of centinels. It is also his duty to attend the *gangway* when any boats arrive aboard, and search them carefully, together with their rowers, that no spirituous liquors may be conveyed into the ship, unless by permission of the commanding-officer. In these several duties he is assisted with proper attendants, called his *corporals*; who also relieve the centinels, and one another, at certain periods.

MASTER of the Horse, a great officer of the crown, who orders all matters relating to the king's stables, races, breed of horses; and commands the equestrians and all the other officers and tradesmen employed in the king's stables. His coaches, horses, and attendants, are the king's, and bear the king's arms and livery.

MASTER of the Revels, an officer who orders all things relating to the performance of plays, masks, balls, &c. at court.

MASTER of the Rolls, a patent-officer for life, who has the custody of the rolls of parliament and patents which pass the great seal, and of the records of chancery, as also commissions, deeds, recognizances; which, being made of rolls of parchment, gave rise to the name.

In absence of the chamberlain, he sits as judge in the court of chancery: at other times he hears causes in the rolls chapel, and makes orders; but all hearings before him are appealable to the chancellor.

MASTER of the Wardrobe, an officer under the lord-chamberlain, who has the care of the royal robes, as well as the wearing apparel, collar, george, and garter, &c. He has also the charge of all former kings and queens robes remaining in the tower, all hangings, bedding, &c. for the king's house, the charge and delivery of velvet and scarlet allowed for liveries. He has under him a clerk of the robes, wardrobe-keeper, a yeoman, &c.

MASTER and Servant; a relation founded in convenience, whereby a man is directed to call in the assistance of others, where his own skill and labour will not be sufficient to answer the cares incumbent upon him. For the several sorts of servants, and how that character is created or destroyed, see the article SERVANT. In the present article we shall consider, first,

25 I

the

Master.



Master. the effect of this relation with regard to the parties themselves; and secondly, its effects with regard to others.

Black.  
Comment.

1. The manner in which this relation affects either the master or servant. And, first, by hiring and service for a year, or apprenticeship under indentures, a person gains a settlement in that parish wherein he last served 40 days. In the next place, persons serving seven years as apprentices to any trade have an exclusive right to exercise that trade in any part of England. This law, with regard to the exclusive part of it, has by turns been looked upon as a hard law, or as a beneficial one, according to the prevailing humour of the times: which has occasioned a great variety of resolutions in the courts of law concerning it; and attempts have been frequently made for its repeal, tho' hitherto without success. At common law every man might use what trade he pleased; but this statute restrains that liberty to such as have served as apprentices: the adversaries to which provision say, that all restrictions (which tend to introduce monopolies) are pernicious to trade; the advocates for it allege, that unskilfulness in trades is equally detrimental to the public, as monopolies. This reason indeed only extends to such trades, in the exercise whereof skill is required: but another of their arguments goes much farther; viz. that apprenticeships are useful to the commonwealth, by employing of youth, and learning them to be early industrious; but that no one would be induced to undergo a seven years servitude, if others, tho' equally skilful, were allowed the same advantages without having undergone the same discipline: and in this there seems to be much reason. However, the resolutions of the courts have in general rather confined than extended the restriction. No trades are held to be within the statute, but such as were in being at the making of it: for trading in a country village, apprenticeships are not requisite, and following the trade seven years is sufficient without any binding; for the statute only says, the person must serve as an apprentice, and does not require an actual apprenticeship to have existed.

A master may by law correct his apprentice for negligence or other misbehaviour, so it be done with moderation: though, if the master or master's wife beats any other servant of full age, it is good cause of departure. But if any servant, workman, or labourer, assaults his master or dame, he shall suffer one year's imprisonment, and other open corporal punishment, not extending to life or limb.

By service all servants and labourers, except apprentices, become entitled to their wages: according to agreement, if menial servants; or according to the appointment of the sheriff or sessions, if labourers or servants in husbandry: for the statutes for regulation of wages extend to such servants only; it being impossible for any magistrate to be a judge of the employment of menial servants, or of course to assess their wages.

2. Let us now see how strangers may be affected by this relation of master and servant; or how a master may behave towards others on behalf of his servant, and what a servant may do on behalf of his master.

And, first, the master may *maintain*, that is, abet

and assist, his servant in any action at law against a stranger: whereas, in general, it is an offence against public justice to encourage suits and animosities, by helping to bear the expence of them, and is called in law *maintenance*. A master also may bring an action against any man for beating or maiming his servant: but in such case he must assign, as a special reason for so doing, his own damage by the loss of his service; and this loss must be proved upon the trial. A master likewise may justify an assault in defence of his servant, and a servant in defence of his master: the master, because he has an interest in his servant, not to be deprived of his service; the servant, because it is part of his duty, for which he receives his wages, to stand by and defend his master. Also if any person do hire or retain my servant, being in my service, for which the servant departeth from me and goeth to serve the other, I may have an action for damages against both the new master, and the servant, or either of them: but if the new master did not know that he is my servant, no action lies; unless he afterwards refuse to restore him upon information and demand. The reason and foundation upon which all this doctrine is built, seem to be the property that every man has in the service of his domestics; acquired by the contract of hiring, and purchased by giving them wages.

As for those things which a servant may do on behalf of his master, they seem all to proceed upon this principle, that the master is answerable for the act of his servant, if done by his command, either expressly given or implied: *nam qui facit per alium, facit per se*. Therefore, if the servant commit a trespass by the command or encouragement of his master, the master shall be guilty of it: not that the servant is excused, for he is only to obey his master in matters that are honest and lawful. If an innkeeper's servants rob his guests, the master is bound to restitution; for as there is a confidence reposed in him, that he will take care to provide honest servants, his negligence is a kind of implied consent to the robbery; *nam, qui non prohibet, cum prohibere possit, jubet*. So likewise if the drawer at a tavern sells a man bad wine, whereby his health is injured, he may bring an action against the master; for although the master did not expressly order the servant to sell it to that person in particular, yet his permitting him to draw and sell it at all is impliedly a general command.

In the same manner, whatever a servant is permitted to do in the usual course of his business, is equivalent to a general command. If I pay money to a banker's servant, the banker is answerable for it: if I pay it to a clergyman's or a physician's servant, whose usual business it is not to receive money for his master, and he imbezles it, I must pay it over again. If a steward lets a lease of a farm, without the owner's knowledge, the owner must stand to the bargain; for this is the steward's business. A wife, a friend, a relation, that use to transact business for a man, are *quod hoc* his servants; and the principal must answer for their conduct: for the law implies, that they act under a general command; and without such a doctrine as this no mutual intercourse between man and man could subsist with any tolerable convenience. If I usually deal with a tradesman by myself, or constantly pay him ready money, I am not answerable for what my servant

Master.

Master,  
Mastification

vant takes up upon trust; for here is no implied order to the tradesman to trust my servant: but if I usually send him upon trust, or sometimes on trust and sometimes with ready money, I am answerable for all he takes up; for the tradesman cannot possibly distinguish when he comes by my order, and when upon his own authority.

If a servant, lastly, by his negligence does any damage to a stranger, the master shall answer for his neglect: if a smith's servant lames a horse while he is shoeing him, an action lies against the master, and not against the servant. But in these cases the damage must be done while he is actually employed in the master's service; otherwise the servant shall answer for his own misbehaviour. Upon this principle, by the common law, if a servant kept his master's fire negligently, so that his neighbour's house was burned down thereby, an action lay against the master; because this negligence happened in his service: otherwise, if the servant, going along the street with a torch, by negligence sets fire to a house; for there he is not in his master's immediate service, and must himself answer the damage personally. But now the common law is, in the former case, altered by statute 6 Ann. c. 3. which ordains, that no action shall be maintained against any in whose house or chamber any fire shall accidentally begin; for their own loss is sufficient punishment for their own or their servant's carelessness. But if such fire happens through negligence of any servant (whose loss is commonly very little), such servant shall forfeit 100 l. to be distributed among the sufferers; and, in default of payment, shall be committed to some workhouse, and there kept to hard labour for 18 months. A master is, lastly, chargeable if any of his family layeth or casteth any thing out of his house into the street or common highway, to the damage of any individual, or the common nuisance of his majesty's liege people: for the master hath the superintendence of all his household. And this also agrees with the civil law; which holds, that the *pater familias*, in this and similar cases, *ob alterius culpam tenetur, sive servi, sive liberi*.

We may observe, that in all the cases here put, the master may be frequently a loser by the trust reposed in his servant, but never can be a gainer: he may frequently be answerable for his servant's misbehaviour, but never can shelter himself from punishment by laying the blame on his agent. The reason of this is still uniform and the same; that the wrong done by the servant is looked upon in law as the wrong of the master himself; and it is a standing maxim, that no man shall be allowed to make any advantage of his own wrong.

**MASTER-WORD**, in botany. See **IMPERATORIA**.

**MASTERS OF CHANCERY**, in ordinary, of which there are 12, the master of the rolls being chief, are usually chosen out of the barristers of the common law, and sit in chancery, or at the rolls, as assistants to the lord-chancellor or master of the rolls.

**MASTICATION**, the action of chewing, or of agitating the solid parts of our food between the teeth, by the motion of the jaws, the tongue, and the lips, whereby it is broken into small pieces, impregnated with saliva, and so fitted for deglutition and a more easy digestion. See **ANATOMY**, n° 368.

Mastich  
Mataro.

**MASTICH**, a kind of resin exuding from the *lentiscus* tree; and brought from Chio, in small yellowish transparent grains or tears, of an agreeable smell, especially when heated or set on fire. This resin is recommended in old coughs, dysenteries, hæmoptoës, weakness of the stomach, and in general in all debilities and laxity of the fibres. Geoffroy directs an aqueous decoction of it to be used for these purposes: but water extracts little or nothing from this resin. Rectified spirit almost entirely dissolves it, and the solution is very warm and pungent. Mastich is to be chosen in drops, clear, well-scented, and brittle.

We meet with a kind of cement sometimes kept in the shops under the name of *maslich*. It is composed of this gum, and several other ingredients, and is formed into cakes for use. This is intended for the service of lapidaries, to fill up cracks in stones, &c. but is by no means to be used for any medicinal purposes.

**MASTIGADOUR**, or **SLABBERING-BIT**, in the manege, a snaffle of iron, all smooth, and of a piece, guarded with paternosters, and composed of three halves of great rings, made into demi-ovals, of unequal big-nels; the lesser being inclosed within the greater, which ought to be about half a foot high.

**MASULAPATAN**, a populous town of Asia in the East Indies, and on the coast of Coromandel, in the dominions of the Great Mogul. It carried on a great trade, and most nations in Europe had factories here; but the English have now left it, and even the Dutch themselves have not above a dozen people here to carry on the chintz trade. The inhabitants are Gentoos, who will not feed on any thing that has life; and they had a famous manufacture of chintz, which is greatly decayed since the English left off buying. The Great Mogul has a custom-house here; and the adjacent countries abound in corn, tobacco, and timber for building. It is seated on the west side of the Bay of Bengal, 200 miles north of fort St George. W. Long. 81. 25. N. Lat. 16. 30.

**MATACA**, or **MANTACA**, a commodious bay in America, on the north coast of the island of Cuba. Here the galleons usually come to take in fresh water in their return to Spain. It is 35 miles from the Havannah. W. Long. 85. 6. N. Lat. 25. 0.

**MATAMAN**, a country of Africa, bounded by Benguela on the north, by Monomotopa on the east, by Cafraia on the south, and by the Atlantic Ocean on the west. There is no town in it, and the inhabitants live in miserable huts, it being a desert country, and but little visited by the Europeans.

**MATAN**, or **MACTAN**, an island of Asia in the East-Indian sea, and one of the Philippines. The inhabitants have thrown off the yoke of Spain; and it was here that Magellan was killed in April 1521.

**Cape MATAPAN**, the most southern promontory of the Morea, between the gulph of Coran and that of Colo-China.

**MATARAM**, a large town of Asia, formerly the capital of an empire of that name in the island of Java. It is strong by situation, and is seated in a very fertile, pleasant, and populous country, surrounded with mountains. E. Long. 111. 25. S. Lat. 7. 55.

**MATARO**, a town of Spain, in Catalonia, remarkable

Match,  
Matching.

able for its glass-works; seated on the coast of the Mediterranean, 15 miles north-east of Barcelona, and 35 south-west of Gironne. E. Long. 2. 35. N. Lat. 41. 30.

MATCH, a kind of rope slightly twisted, and prepared to retain fire for the uses of artillery, mines, fire-works, &c.

It is made of hempen-tow, spun on the wheel like cord, but very slack; and is composed of three twists, which are afterwards again covered with tow, so that the twists do not appear: lastly, it is boiled in the lees of old wines. This, when once lighted at the end, burns on gradually and regularly, without ever going out, till the whole be consumed: the hardest and driest match is generally the best.

*Quick-Match.* See *Quick-Match*.

MATCHING, in the wine-trade, the preparing vessels to preserve wines and other liquors, without their growing four or vapid. The method of doing it, is as follows: Melt brimstone in an iron ladle, and when thoroughly melted, dip into it slips of coarse linen-cloth; take these out, and let them cool: this the wine-coopers call a *match*. Take one of these matches, set one end of it on fire, and put it into the bung-hole of a cask; stop it loosely, and thus suffer the match to burn nearly out: then drive in the bung tight, and set the cask aside for an hour or two. At the end of this time examine the cask, and you will find that the sulphur has communicated a violent pungent and suffocating scent to the cask, with a considerable degree of acidity, which is the gas and acid spirit of the sulphur. The cask may after this be filled with a small wine which has scarce done its fermentation; and bunging it down tight, it will be kept good, and will soon clarify: this is a common and very useful method; for many poor wines could scarce be kept potable even

a few months without it.

MATE of a SHIP or WAR, an officer under the direction of the master, by whose choice he is generally appointed, to assist him in the several branches of his duty. Accordingly, he is to be particularly attentive to the navigation in his watch, &c. to keep the *log* regularly, and examine the line, and glasses by which the ship's course is measured, and to adjust the sails to the wind in the fore-part of the ship. He is to have a diligent attention to the cables, seeing that they are well coiled and kept clean when laid in the tier, and sufficiently served when employed to ride the ship. Finally he is to superintend, and assist at the stowage of the hold, taking especial care that all the ballast and provisions are properly stowed therein.

MATE of a Merchant Ship, the officer who commands in the absence of the master thereof, and shares the duty with him at sea; being charged with every thing that regards the internal management of the ship, the directing her course, and the government of her crew.

The number of mates allowed to ships of war and merchantmen is always in proportion to the size of the vessel. Thus a first-rate man of war has six mates, and an East-Indiaman the same number; a frigate of 10 guns, and a small merchant ship, but only one mate in each; and the intermediate ships have a greater or smaller number, according to their several sizes, or to the services on which they are employed.

*Dura* and *Pia MATER*, the names given by anatomists to the two membranes which surround the brain. See *ANATOMY*, n° 394, 395.

MATERA, a considerable town of Italy, in the kingdom of Naples, and in the Terra d'Otranto, with a bishop's see, seated on the river Canapro. E. Long. 16. 43. N. Lat. 40. 51.

Mate,  
Matera.

## M A T E R I A M E D I C A,

Of Classi-  
fication.

A GENERAL name for every substance used in medicine, and by some extended even to every article used as food or drink.

Thus the materia medica becomes exceedingly extensive: however, before we enter upon any particular discussion of the subject, it appears proper to give some general idea of medicines and their operation.

A *medicine*, properly so called, is a substance which, when applied to the living human body, makes such an alteration in it as either to prevent the approach of disease, or to remedy a morbid state when already present. Such substances as may be used for these purposes without any great preparation are called *simple medicines*, or *simples*; and with these the writers on materia medica are chiefly conversant. In treatises written professedly on this subject, it is common to give a particular description of each article, the characteristic marks by which it may be distinguished from all other substances, and the methods by which an adulteration or an imperfection may be discovered in it, together with the dose in which it can safely be given: but as all these particulars are taken notice of in different parts of this work, it is only necessary here to mention the general classification, and enumerate the names of the various substances used in medicine, af-

ter giving, as hath been already promised, a brief and Of general account of their mode of operation. Classification.

Concerning the manner in which medicines act, physicians have greatly differed, and each has followed his own particular theory. The followers of Boerhaave have supposed their action to be directly upon the solids and fluids; while those who build their theories on the hypothesis of Hoffman have asserted, that all medicines act immediately upon the nervous system, and from thence only in a secondary manner are their effects diffused over the solids and fluids. To discuss this question is not our business at present: neither indeed is it a matter of great consequence whether it be discussed or not; seeing all parties must own, that certain effects follow the use of certain particular substances, whether these substances act first upon the nervous system or upon the solids and fluids.

From their operations on the human body medicines are most usually divided into classes. Some are found to have the property of rendering the solid parts of the body more lax than before, and are therefore called *relaxing* medicines: Others there are which have an effect directly contrary, and are therefore called *indurating* medicines: A third kind are found to excite inflammation in the part to which they are applied,



applied, and are therefore called *inflammatory* medicines: And, lastly, a fourth kind are found remarkably either to increase or diminish the vigour of the body, or what is called the *tone* of the solids; and have therefore got the name of *tonics* if they increase, and *sedatives* if they diminish, this tone.

Some medicines are supposed neither remarkably to increase nor diminish the tone of the solids; but to perform their office either by correcting some morbid matter in the body, or by evacuating it: in the former case they are called *alterants*, in the latter *evacuants*.

These are the general divisions or classes into which medicines are commonly divided; but when we begin more particularly to consider their virtues, a great many inferior divisions arise.—Of the relaxing medicines, some, when externally applied, are supposed only to soften the part; and in that case are called *emollients*: while others, which have a power of converting the humours stagnating in any inflamed part, into pus, are called *maturants*, or *suppuratives*. Sedative medicines, externally applied, are sometimes called *paregorics*: when taken internally, if they take off a spasm then existing in the body, they are called *antispasmodics*; if they mitigate pain, *anodynes*; if they produce a quiet sleep, *hypnotics*; or if they produce a very deep and unnatural sleep, together with a remarkable stupefaction of the senses, they are then called *narcotics*.

Tonic medicines obtain the name of *corroboratives*, *analeptics*, or *nervine* medicines, when they slightly increase the contractile power of the solids; but of *afstringents*, if they do this in a great degree, especially if at the same time that they indurate the solids they also coagulate the fluids. Some of these medicines have received names from their supposed virtue of promoting the growth of the flesh, consolidating wounds, and stopping fluxes of blood: but it is now discovered that no medicines whatever are endowed with any such powers; and therefore the divisions into *sarcotics*, *traumatics*, or *vulneraries*, &c. are seldom used.—If astringent medicines are used with an intention to drive, by the constriction which they occasion, any kind of matter from the surface towards the internal parts of the body, they are called *repellents*; but if they insensibly expel any kind of stagnating matter from the parts where it is contained, they are then called *discretants*; and lastly, *stimulants*, or *attractives*, if they bring a greater flux of humours to the part to which they are applied.

As to medicines of the inflammatory kind, they are divided into *vesicatories* or blisters, which by their application raise watery bladders on the skin; and *cathartics*, *embarcatics*, or *corrosives*, if they eat into and destroy the substance of the solid parts themselves. Another subdivision has been added, viz. that of *rube-factive* medicines, or such as only induce a redness on the part to which they are applied; but these belong to the vesicatories, and what proves only *rube-factive* to one will frequently blister another.

The alterants are divided into *absorbents*, such as by their alkaline quality neutralise and destroy any acid matter which may be in the stomach; and *antiseptics*, or those which correct any putrid matter in it; *coagulants* when they thicken the humours, and *resol-*

*vents* if they thin them; *heating* medicines when they increase the velocity of the blood, and *refrigerating* if they diminish it.

The evacuating medicines are divided according to the nature of the humour they evacuate. Thus, if they evacuate the contents of the stomach by vomiting, they are called *emetics*; if they induce purging, they are called *cathartics*; if they only evacuate the immediate contents of the intestines, they are named *ecoprotics*; or if a moderate evacuation is produced, without sickness or pain, they are called *laxatives*.—The medicines which gently promote the expulsion of humours through the pores of the skin, are called *diaphoretics*. If they do this in great quantity and with violence, they are called *sudorifics*. Such as excite urine, are called *diuretics*. Such as produce their evacuation by the glands of the palate, mouth, and salivary ducts, are called *salivating* medicines; those which promote the evacuation of mucus from the throat, are called *apophlegmatics*; while those which evacuate by the nose, are called *ptarmics*, *errhines*, *sternutatories*; and those which promote the menstrual flux, *emmenagogues*.—To the order of evacuants also some reduce those medicines which expel any unnatural bodies, as worms, stones, and stasus. Those which destroy worms are called *anthelmintics*; those which dissolve the stone in the bladder, *lithontriptics*; and such as expel stasus, *carminatives*.

According to these divisions Mr Vogel classes the articles of his *Materia Medica*; but Dr Lewis chooses to arrange them according to the natural qualities of the substances themselves, and not their effects on the human body.

1. Writers on the *materia medica* (he observes) have taken great pains in arranging the various articles of which it is composed, into different divisions and subdivisions, according to their real or reputed medicinal powers.

2. It has been imagined, that the whole *materia medica* is reducible under the three distinctions of *alteratives*, *evacuants*, and *refractories*: the first comprehending all that has any power to alter the constitution, without sensibly increasing or diminishing any of the natural evacuations; the second, whatever visibly promotes those discharges; and the third, all that contributes to lessen them, and make the increase greater than the waste. These divisions being too general, they are broken into subdivisions; and these again are further divided into different classes, under more restrained denominations, as cardiac, carminative, hysseric, stomachic, &c.

3. Specious as this plan may appear to be, he imagines the execution of it, to any useful purpose, would require a far more extensive knowledge of the nature and operation of medicines, than has yet been attained to. A just and useful method of simples is scarcely to be expected, while those properties on which the method is founded are imperfectly known, and in many articles only conjectural.

4. In all the arguments that have been hitherto contrived upon this plan, there appears a striking incongruity among the several articles of which even the ultimate subdivisions are composed; substances extremely dissimilar being classed together, as cantharides and tea, tobacco and bran, hemlock and cowslips, scurvy.

scurvy-grafs and raifins, arum root and liquorice, wormwood and parifeps, cinnamon and nettles, rafberries and chalk, artichokes and alum, cloves and coffee, muftard-feed and black cherries, &c. Nor are thefe incongruities to be laid always to the charge of the authors, the nature of the fyftem itfelf, rendering them often unavoidable; for the particular effect which entitles a medicine to a particular clafs, may be produced by fubftances very diffimilar, and even oppofite, in their general powers: thus the alvine excretions are reftained by ftarch, wax, tormentil-root, opium; among the capital diuretics are cantharides, nitre, falt, fixt alkaline falts, fquills. It fhould feem, that the method of arrangement cannot be a juft one which requires fubftances fo difcordant to be ranked together, and which further requires each of thefe fubftances to be ranked over again, in other claffes, along with other fubftances to which they are equally difcordant.

5. There is alfo a material imperfection in this fcheme, even in the primary divifions. Steel and its preparations act, in different circumftances, both as evacuants and reftoratives. Mercury and antimony afford, in their different preparations, both evacuants and alteratives; and there are many other drugs which are fometimes ufed as alteratives, and fometimes as evacuants: indeed, all evacuants, in diminifhed dofes, feem to act merely as alteratives. It fhould feem therefore, that "the divifion of the whole materia medica into alteratives, evacuants, and reftoratives," is a divifion not founded in nature, even if there was no objection to the vague meaning of the appellations itfelves.

6. Cartheufer has divided the materia medica on a plan which appears more rational. Inftead of the operations of medicines in the human body, which are precarious, complicated, and greatly diverfified according to the dofe, the preparation, and the circumftances of the patient, he takes for the bafis of his arrangement their more fimple, obvious, and conftant properties, as bitternefs, fweetnefs, aftringency, acidity, &c. Having confidered the nature of bitternefs, for inftance, in general, he examines what effects medicines poffeffed of this property are capable of producing in the body, and in what circumftances they may be expected to be ferviceable, and then proceeds to an account of the particular bitters.

7. This method is of real ufe, but its ufe is limited to a fmall part of the materia medica. There are many of the medicinal fimples, in which we can diftinguifh no prevailing qualities of this kind; there are many, in which different qualities are blended together; and many which, though fimilar in thefe kinds of qualities, are very diffimilar in their operations in the human body: thus though gentian and aloes agree in having a bitter tafte, and fugar and manna in being fweet, their medicinal virtues are refpectively very different. Accordingly, the author is obliged in fome cafes to depart from his general plan, and found the divifion on the medicinal effects: he makes one clafs of purgatives and emetics, and another of vaporofe inebriants and narcotics: this laft clafs confifts of tobacco, elder-flowers, faffron, opium, and poppy-feeds, fubftances certainly very difcordant in all their qualities that relate to medicinal intentions.

8. In this article, inftead of attempting a medicinal diftribution of the fimples, which we apprehend not to be practicable to any good purpofe, and which, as hitherto executed, feems more likely to miflead the reader than to promote true knowledge, we fhall take them in the order of the alphabet; and even in this order, we fhall feldom perhaps find fubftances more diffimilar come together, than thofe which have been joined into one clafs by fome of the fyftematic writers. It may be proper, however, to premife fome general obfervations on certain claffes of medicines in Cartheufer's manner, and thus to preferve the lefs exceptionable parts of his plan, with fome amendments.

## ART. I. ACIDS.

- Clafs 1. *Vegetable* { native; as forrel, wood-forrel, juice of lemon, oranges, barberries, and other fruits.  
produced by fermentation; as vinegar and tartar.
- Clafs 2. *Mineral*: the acids of vitriol, nitre, and common falt.

9. THE medical effects of acids, duly diluted and given in proper dofes, are, to cool, quench thirft, correct a tendency to putrefaction, and allay inordinate motions of the blood. By thefe qualities, in hot bilious temperaments and inflammatory diforders, they frequently reftain immoderate hæmorrhages, and promote the natural fecretions; in fome kinds of fever, they excite a copious diaphoresis, where the warm medicines, called *alexipharmicæ*, tend rather to prevent this falutary difcharge.

10. Vegetable acids, particularly the native juices of certain plants and fruits, have fome degree of a faponaceous quality; by means of which they attenuate or difsolve vifcid phlegm and deterge the veffels, and thus prove ferviceable in fundry chronic diforders. Inveterate fcurvies have fometimes yielded to their continued ufe, efpecially when given in conjunction with medicines of the acid or pungent kind: experience has fhown, that the acid antifeorbutics have much better effects when thus managed than when exhibited by themfelves; hence in the *fucci fcorbutici* of our difpenfatory, Seville orange juice is ufelefly joined to that of the *cochlearia* and *nafurtium*.

11. The mineral acids intantly coagulate blood: the vegetable dilute it, even when impiffated or thickened by heat; in which ftate, watery liquors will not mingle with it. Hence in fome fevers, where water runs off by the kidneys almoft as pale and infipid as it was drank, vegetable acids render the urine of the due colour and quality. The mineral acids (the fpirit of nitre in particular) combined with vinous fpirits, have a like effect.

12. Acids are prejudicial in cold, pale, phlegmatic habits, where the veffels are lax, the circulation languid, bile deficient, and the power of digeftion weak. In thefe cafes, an acid is often generated in the ftomach, from milk and moft vegetable foods; which, whilft it continues in the firft paffages, occasions uneafinefs about the ftomach, flatulencies, fometimes griping pains of the bowels, and vomitings.

ART. II. INSIPID EARTHS *capable of ABSORBING ACIDS.*

|                                 |              |
|---------------------------------|--------------|
| Oyster-shells,                  | Chalk,       |
| Crabs claws and eyes so called, | Some marles, |
| Coral, red and white,           | Lime-stones, |
| Pearls,                         | Marbles,     |
| Bezoar,                         | Spars.       |

13. THE virtues of these substances are, to absorb or destroy acidities in the first passages, and consequently to remove such disorders as proceed from that cause. The cordial, alexipharmic, antifebrile, and other like virtues attributed to these medicines, appear to have little foundation; or at best, are only secondary ones. When united with the acid, they form a neutral saline compound, possessing some degree of an aperient and detergent quality, though too inconsiderable to be in general regarded.

14. The absorbent earths were all strangers to medicine in the earlier times; and their use does not seem to have been established before the last century; when some practitioners, from an opinion that most kinds of diseases proceeded from a preternatural acid, introduced a great variety of antacid bodies, both of the earthy and saline kind, and very liberally exhibited them on almost every occasion.

15. It is certain, that in children, and adults of a weak constitution, and whose food is chiefly of the vegetable acceftent kind, sundry disorders are occasioned by acidities; these readily discover themselves by four eructations, the pale colour of the face, and in children by the four smell and green colour of the alvine fæces, which are sometimes so manifestly acid as to raise a strong effervescence with alkaline salts. In these cases, and these only, the use of absorbent earths is indicated.

16. If there are really no acid juices in the ventricle, these earths are apt to concreate with the mucous matter usually lodged there, into hard indissoluble masses; which have sometimes been thrown up by vomit, or found in the stomach upon dissection. Hence indigestion, loss of appetite, nausea, vomiting, obstructions of the bowels, and other disorders. Sometimes the stomach and intestines have been found lined with a crust, as it were, of these earthy bodies, which must not only have prevented the separation of the gastric liquor, but likewise have closed the orifices of the lacteal vessels, so as to obstruct the passage of the chyle into the mass of blood.

17. Some suppose the earthy powders capable (without the concurrence of any acid) of passing the lacteals along with the chyle; and allege, in support of this opinion, that, when triturated with water, they are in part taken up and carried with it through a filter of paper; the filtrated liquor leaving, upon evaporation, a portion of whitish earthy matter. This experiment (allowing the consequence to be justly drawn from it) is itself erroneous: the residuum proceeds from the earth naturally contained in the water, not from that employed in the experiment; for if pure distilled water be made use of, it will leave no residuum, though long triturated, or digested with the earth.

18. All these bodies, particularly those of the animal

kind, contain, besides their purely alkaline earth, a portion of glutinous matter. An instance of this we have in crabs-eyes, which if macerated in the weaker acids, or in the stronger sufficiently diluted with water, the earthy part will be dissolved, and the animal-glue remain in form of a soft transparent mucilage. The glutinous substance increases their tendency to concreate in the stomach; and thence those which contain least thereof should be preferred to the others. The mineral earths contain the least of this kind of matter, and some of them are very easy of solution; chalk, for instance; which may therefore be given with greater safety than the animal-absorbents. These substances, divested of their conglutinating matter by means of fire, are reduced into acrimonious calces or limes, and thus become medicines of a different class.

19. The teeth, bones, hoofs, and horns of animals consist of the same principles with the animal-absorbents above-mentioned, but combined in different proportions: the quantity of gelatinous matter is so large, as to defend the earthy part from the action of weak acids; whilst the earth, in its turn, protects the gluten from being easily dissolved by watery liquors. Hence these bodies in their crude state, though recommended as possessing singular virtues, are not found to have any virtue at all.

20. Experiments have been made for determining the degree of solubility, or comparative strength of these earths; the principal of which are arranged in the two following tables, one taken from Langius, and the other from Homberg.

TABLE of the quantity of Acid destroyed by different Absorbents.

|               | Some kinds of Limestones  | 160 |                          | 150                      |
|---------------|---------------------------|-----|--------------------------|--------------------------|
|               |                           |     |                          |                          |
| Ten grains of | Oyster shells             | 100 | destroyed the acidity of | Drops of Spirit of Salt. |
|               | Chalk                     | 100 |                          |                          |
|               | Shells of Garden-snails   | 100 |                          |                          |
|               | Calcedin Cray-fish        | 100 |                          |                          |
|               | Pearls                    | 80  |                          |                          |
|               | Tooth of the Sea-horse    | 80  |                          |                          |
|               | Volatile Salts            | 80  |                          |                          |
|               | Fixt Salts                | 60  |                          |                          |
|               | Coral, red and white      | 60  |                          |                          |
|               | Crabs-eyes                | 50  |                          |                          |
|               | Egg-shells                | 50  |                          |                          |
|               | Mother of Pearl           | 50  |                          |                          |
|               | Crab-claws                | 40  |                          |                          |
|               | Jaw-bone of the Pike fish | 30  |                          |                          |

TABLE of the quantity of Absorbent Earths soluble in Acids.

|  |                   |     |
|--|-------------------|-----|
| 576 grains of Spirit of Salt dissolved of  | Crabs-eyes        | 216 |
|  | Mother of Pearl   | 144 |
|  | Pearls            | 128 |
|  | Oyster-shells     | 156 |
|  | Hartstorn         | 165 |
|  | Coral             | 186 |
|  | Oriental Bezoar   | 118 |
|  | Occidental Bezoar | 123 |
| 576 grains of Spirit of Nitre dissolved of | Quick Lime        | 199 |
|  | Slacked Lime      | 193 |
|  | Crabs-eyes        | 297 |
|  | Mother of Pearl   | 204 |
|  | Pearls            | 219 |
|  | Oyster-shells     | 236 |
|  | Hartstorn         | 234 |
|  | Coral             | 233 |
|  | Oriental Bezoar   | 108 |
|  | Occidental Bezoar | 144 |
|  | Quick Lime        | 180 |
|  | Slacked Lime      | 216 |



24. These experiments do not sufficiently ascertain the point intended by them : in the first sett, the quantity of acid is too vague and indetermined ; in the second, we are not told whether the acid was perfectly saturated ; and in both, the acids made use of were so very different from any that can be supposed ever to exist in the human body, that little can be concluded from them with regard to the medical effects of these absorbents. Trial should have been made with the mild vegetable acids, as the juices of certain fruits, four fermented liquors, or rather with four milk. Nevertheless these tables, though not so perfect as could be wished, have their use in the hands of such as can make proper allowances.

### ART. III. EARTHS NOT DISSOLUBLE in Acids, or other liquors.

These may be ranged in two classes.

Class 1. *Hard crystalline earths* : as the ruby, garnet, emerald, sapphire, hyacinth, and other precious stones ; crystal, flint, &c.

25. THESE kinds of substances were introduced into medicine, and many fabulous virtues attributed to them by the superstition of the earlier ages. Some of them are still preserved in foreign pharmacopœias, but at length very justly expunged from ours, notwithstanding what some late writers of repute speak of their medical virtue. These indissoluble hard bodies are not capable of producing any other effect, than by their rigid angular particles (which, though levigated with the utmost care, the microscope still discovers in them) to offend or wound the intestines. In levigation, they wear off so much from the hardest marble instruments, as will equal or exceed their own weight : from this circumstance we may account for their having sometimes appeared to act as absorbents. Some of these stones, exposed to a vehement fire, become in some measure friable ; but nevertheless remain indissoluble. Most of the coloured ones by this treatment lose their colour ; and in this state, prove nearly of the same quality with common crystal : such are, the sapphire, emerald, amethyst, and cornelian. Others melt into a blackish vitreous matter, from which a portion of iron is obtainable by proper fluxes ; as the hyacinth and garnet. Geoffroy concludes from hence, that these stones really possess some medical virtues, depending upon their metallic part ; but the quantity of metallic matter, sufficient to give them a considerable tinct, is so exceedingly small, and so inclosed in a stony matter not at all soluble by any of the known menstrua, as scarce to admit of any possibility of its acting in the human body.

Class 2. *Softer earths* ; the talky, gypseous, and argillaceous.

26. THE talcs and gypsums have rarely been used as medicines. Some of the former, from their unctuous softness and silver hue, stand recommended externally as cosmetics ; and some of the latter, on little better foundation, internally as astringents. But they have long been deservedly rejected by the judicious practitioners. They seem to possess the ill qualities of the alkaline earths, (concreting with the mucus of the stomach, &c.) without any of their good ones.

27. Several of the clays, boles, and terræ sigillatæ, were highly celebrated by the ancients as astringents and alexipharmics, and some of them still continue in esteem ; though it is certain they have no great claim to the virtues that have been attributed to them. Their real effects are, to give a greater degree of consensuality to the fluids in the first passages, and in some measure defend the solids from their acrimony.

28. Most of these bodies contain, besides the tenacious indissoluble earth, which is their principal characteristic, (1.) A portion of an earth soluble in acids, similar to those of the first section. (2.) Of acid, separable by distillation in a strong fire : this acid is always of the same nature with that obtained from vitriol, sulphur, and alum. (3.) The coloured ones contain likewise small quantities of iron, reducible, by inflammable fluxes, into its metallic form. In consequence of the first of these ingredients, these earths may be looked upon in some measure as absorbent : the acid appears to be united with a part of the absorbent earth into a saline compound, approaching to an aluminous nature ; whence they have some degree of astringency : whether they receive any peculiar virtue from the iron, is greatly to be doubted ; since it is in a very crude state, and in quantity extremely small.

29. These earths unite with water into a turbid liquor, slippery and smooth to the touch, and remain for some time suspended ; the sand, grit, or other grosser matters, which are often found naturally mingled with them, subsiding. They may be freed by means of acids from their alkaline earth ; by coction in water, from their saline matter ; and the coloured ones from their iron by digestion in aqua regis, the only menstruum we are acquainted with that will extract the ferruginous matter of argillaceous and bolar earths. This purified, they have all nearly the same appearance and qualities. Exposed to a strong fire, they lose their soft glutinous quality, and are reduced into hard masses, indissoluble as at first.

### ART. IV. GLUTINOUS vegetable and animal substances.

#### Class 1. Vegetable.

| Pure gums :               | Vegetables abounding |
|---------------------------|----------------------|
| Tragacanth,               | with mucilage :      |
| Seneca,                   | Orchis root,         |
| The gums of cherry, plum, | Althæa root,         |
| and other European trees. | Quince-seeds, &c.    |

30. GUMS and mucilages are glutinous vegetable productions, of no particular taste or smell, soluble in water, but not in vinous spirits or in oils. They differ from one another, only in degree of tenacity : the more tenacious are called *gums* ; those which are less so, *mucilages*. The first naturally exude from certain trees and shrubs ; the latter are extracted by art. Almost all vegetable substances contain some portion of these, which, after the resinous part has been extracted by spirit, may be separated from the remaining matter by means of water.

31. The general virtues of these kinds of substances are, to thicken the fluids, and defend the solids from them when grown sharp or corrosive. Hence their use in a thin acrimonious state of the juices, and where the natural mucus of the intestines is abraded.

Class

Clafs 2. *Animal.*

32. Most animal-substances (the fat excepted) contain a viscous matter, in many respects similar to the foregoing, and capable of being extracted by strong coction in water.

33. Animal glues and gellies have the general qualities of the vegetable gums and mucilages; with this difference, that the former are more nutrimental, and apt to run into a putrid state. Considered as the subjects of chemistry, the difference betwixt them is very great: those of the animal kind are changed by fire into a volatile alkaline salt, and a fetid oil; the vegetable into an acid liquor, and a very small portion of oily matter, considerably less fetid than the former.

ART. V. *Soft UNCTUOUS Substances.*

Clafs 1. *Inspid vegetable oils; and substances abounding with them*, as almonds, and the kernels of most fruits; linseed, and the medullary part of sundry other seeds.

Clafs. 2. *Animal fats; as spermaceti.*

34. UNCTUOUS vegetables unite with water, by trituration, into a milky liquor; and give out their oil upon expression.—These kinds of oils and animal-fats dissolve not in any menstruum except alkaline ones; which change their quality, and reduce them into a soap, dissoluble in water, but more perfectly in vinous spirits: from this compound, the oil may, by a skilful addition of acids, be recovered in a purer state than before, and rendered soluble, like essential oils, in spirit of wine.

35. The medical virtues of these substances are, to obtund acrimonious humours, and to soften and relax the solids: hence their use internally, in tickling coughs, heat of urine, pains, and inflammations; and externally in tension and rigidity of particular parts. The milky solutions, commonly called *emulsions*, tho' much less emollient than the oils themselves or animal-fats, have this advantage, that they may be given in acute or inflammatory distempers, without danger of the ill consequences which the others might sometimes produce: fats and oils, kept in a degree of heat no greater than that of the human body, soon become rancid and acrimonious; whilst emulsions tend rather to grow sour.

ART. VI. *ASTRINGENTS.*

|                 |                 |
|-----------------|-----------------|
| Galls,          | Balaustines,    |
| Tormentil-root, | Terra Japonica, |
| Bilwort root,   | Acacia, &c.     |

36. ASTRINGENT substances are distinguished by a rough austere taste; and changing solutions of iron, especially those made in the vitriolic acid, of a dark purple or black colour.

37. Astringents yield their virtues by infusion both to water and vinous spirits, generally in greatest perfection to the former. Oils extract nothing from them; nor do they give over any of their virtue in distillation: nevertheless their astringency is considerably abated by evaporating decoctions of them to the consistence of an extract, and totally destroyed by long keeping.

38. The medical effects of these kinds of substances are, to constringe the fibres, and incrassate or lightly thicken the juices. Their more experienced use is in disorders proceeding from a debility or flaccid state of the solids; in hæmorrhages, from a thinness of the blood, laxity or rupture of the vessels; in preternatural discharges of other kinds, after the offending matter has been duly corrected or evacuated; and in external relaxations.

39. In some cases, they produce the effects of aperients; the vessels, constringing and strengthened by them, being enabled to protrude the circulating juices with greater force.

40. A good deal of caution is requisite in the use of these medicines, especially those of the more powerful kind. In plethoric habits, inveterate obstructions, critical evacuations, and in all kinds of fluxes in general before the morbid matter has been expelled, or where there is any stricture or spasmodic contraction of the vessels, astringents prove eminently hurtful. Where critical dysenteries or diarrhæas are restrained by styptics, the acrimonious matter, now confined in the intestines, corrodes or inflames them; and sometimes occasions a gangrene of the parts.

ART. VII. *SWEETS.*

|        |                |
|--------|----------------|
| Sugar, | Raifins,       |
| Honey, | Liquorice, &c. |

41. THE vegetable sweets are a very numerous tribe; almost every plant that has been examined, discovering in some of its parts a saccharine juice. The bottoms of flowers, and most kinds of seeds and grain when they begin to vegetate, are remarkably sweet.

42. Vegetable sweets are extracted both by water and vinous spirits, most readily by the first, but in greatest perfection by the latter. Nothing of their taste arises in distillation with either of these liquors: nevertheless, by long boiling with water they become somewhat less agreeable; but are not much injured by being treated in the same manner with rectified spirit.

43. The purer sweets, as sugar, promote the union of distilled oils with watery liquors, and prevent the separation of the butyraceous part from milk: from this quality, they are supposed to unite the unctuous part of the food with the animal juices. Hence some have concluded, that they increase fat: others, that they have a contrary effect, by preventing the separation of the unctuous matter which forms the fat from the blood: and others, that they render the juices thicker and more sluggish, retard the circulation and cuticular excretion, and thus bring on a variety of disorders. But sweets have not been found to produce any of these effects in any remarkable degree: common experience shows, that their moderate, and even liberal, use is at least innocent; that they reconcile, not only to the palate, but to the stomach also, substances of themselves disagreeable to both; and thus render salutary what would otherwise be injurious to the body.

44. The unctuous and mucilaginous sweets, as the impure sugars, liquorice, &c. have a considerable degree of emollient and lubricating virtue.—Those ac-

Acids, &c. accompanied with a manifest acid, as in the juices of most sweet fruits, are remarkably relaxing; and if taken immoderately, occasion diarrhoea and dysenteries, which sometimes have proved fatal.

#### ART. VIII. ACRIDS.

45. ACRIDS are substances of a penetrating pungency. Applied to the skin, they inflame or exulcerate it: chewed, they occasion a copious discharge of saliva: and snuffed up the nose, they provoke sneezing.

46. These substances, considered as the subjects of pharmacy, may be divided into three classes,

- |                         |   |  |
|-------------------------|---|--|
| Yielding their acrimony | { | 1. In distillation with water: as horse-radish, mustard, scurvy-grass, &c. |
|                         |   | 2. By infusion only: as the greatercelandine, pyrethrum, &c.               |
|                         |   | 3. Neither to infusion, nor distillation: as arum and dracunculus.         |

47. The general effects of acid medicines are, to stimulate the vessels, and dissolve tenacious juices. In cold leucophlegmatic habits, stagnations of the fluids, and where the contractile power of the solids is weak, they prove powerful expectorants, deobstruents, diuretics, and emmenagogues; and if the patient is kept warm, sudorifics. In hot bilious constitutions, plethoric habits, inflammatory distempers, where there is already a degree of irritation, where the juices are too thin and acrimonious, or the viscera unsoft, these stimulating medicines prove highly prejudicial, and never fail to aggravate the disease.

48. Certain acid substances have been lately recommended in dry convulsive asthma: of the efficacy of the Iguill in particular, for the cure of this disorder, several instances are related in the *Commercium Literarium* of Norimberg for the years 1737 and 1739. Cartheuser thinks, that not the asthma itself, but a particular effect of it, was removed by this medicine. He observes, that in all asthmas the free circulation of the blood through the pulmonary vessels is impeded; and hence, during every paroxysm, the lungs are in a kind of oedematous state: that if this oedema, becoming habitual, remains after the fit is over, it is either perpetually occasioning fresh ones, or gives rise to a dropsy of the breast: that acid medicines, by removing the oedema, remove what was originally an effect of the asthma, and in time a cause of its aggravation.

#### ART. IX. AROMATICS.

49. AROMATICS are substances of a warm pungent taste, and a more or less fragrant smell. Some of the spices are purely aromatic, as cubebæ, pepper, cloves; some substances have a sweetness mixed with the aromatic matter, as angelica root, aniseed, fennel seed; some an astringency, as cinnamon; some a strong mucilage, as cassia lignea; some a bitterness, as orange-peel. The aromatic matter itself, contained in different subjects, differs also not a little in its pharmacæutic properties. It is extracted from all by rectified spirit of wine; from some in great part, from others scarcely

at all, by water. The aromatic matter of some sub-jects, as of lemon-peel, rises wholly in distillation both with spirit and water; that of others, as cinnamon, rises wholly with water, but scarcely at all with spirit; while that of others, as pepper, is in part left behind after the distillation of water itself from the spice.

50. With regard to the general virtues of aromatics, they warm the stomach, and by degrees the whole habit; raise the pulse, and quicken the circulation. In cold languid cases, phlegmatic habits, and a weak flaccid state of the solids, they support the vitality, and promote the salutary secretions. In hot bilious temperaments, plethoric habits, inflammatory indispositions, dryness and stricures of the fibres, they are generally hurtful.

#### ART. X. BITTERS.

|               |                  |
|---------------|------------------|
| Gentian root, | Lesser centaury, |
| Hops,         | Carduus, &c.     |

51. BITTERS for the most part yield their virtue both to watery and spirituous menstrua; some more perfectly to one, and others to the other. None of the substances of this class give over any thing considerable of their taste in distillation, either to water or to spirit; their bitterness remaining entire, and frequently improved, in the extracts. Such as are accompanied with flavour, as wormwood, may by this process be reduced into simple flavourless bitters.

52. These substances participate of the virtues of astrigents and aromatics. Their general effects are, to constringe the fibres of the stomach and intestines, to warm the habit, attenuate the bile and juices in the first passages, and promote the natural evacuations, particularly of sweat and urine. In weakness of the stomach, loss of appetite, indigestion, and the like disorders, proceeding from a laxity of the solids, or cold sluggish indisposition of the juices, these kinds of medicines do good service. Where the fibres are already too tense and rigid, where there is any immoderate heat or inflammation, bitters very sensibly increase the distemper; and, if their use is continued, communicate it to the kidneys: hence the urine becomes high-coloured, small in quantity, and at length suppressed; a dropsy soon succeeding. If the kidneys were before so lax as to remain now uninjured, yet the other viscera become gradually more and more rigid, and a tabes is at length brought on.

53. Bitter substances destroy insects, and prevent putrefaction. Hence they are recommended as antihelminthic, and externally as antiseptics.

#### ART. XI. EMETICS AND CATHARTICS.

|              |              |
|--------------|--------------|
| Hellebore,   | Colocynth,   |
| Julip,       | Scammony,    |
| Ipecacuanha, | Gamboge, &c. |

54. THESE substances consist of a resinous part, in which the purgative or emetic quality resides: and a gummy saline one, which acts chiefly as a diuretic. The first is extracted or dissolved by vinous spirits; the latter by water. Nothing arises in distillation from either.

55. The acid resins, exhibited by themselves, tenaciously adhere to the coats of the intestines, by their stimulating power irritate and inflame them, and thus produce sundry violent disorders. Hoffman relates,



lates, that he has sometimes observed convulsions, and a paralysis of both sides, from their use.

56. These inconveniences may be avoided, by previously triturating them with substances capable of dividing their tenacious texture, and preventing their adhesion: by this means, they become mild and safe, operate without disturbance, and at the same time more effectually answer the purposes intended by them.

57. Some have endeavoured to correct the ill quality of the resinous purgatives, by the addition of acids and aromatic oils. Acids weaken their power, but have no other effect than what a diminution of the dose would equally answer. The pungent essential oils may serve to warm the stomach, make the medicine sit easier, and thus prevent the nausea, which sometimes happens; but as soon as the resin begins to exert itself in the intestines, these oils, instead of correcting, increase its virulence; being themselves apt to occasion the inconveniences which they are here intended to prevent, an irritation and inflammation of the bowels. Alkaline salts or soaps have a better effect; as they dispose the resin to solution, and promote its operation.

58. The medicines of this class seem to act by liquefying the juices, and stimulating the coats of the stomach and intestines. If the irritation is strong and sudden, their action is quick and upwards: if slower, downwards. Cathartics given in a liquid form, or in very sensible habits, often prove emetic; and emetics, where mucus abounds, cathartic. They operate more violently in robust constitutions, than in those of a contrary temperament; the vessels being in the former more tense and rigid, and consequently less capable of bearing an equal degree of irritation.

59. The action of these medicines is extended beyond the primæ viæ: This appears evident from the increase of the pulse which always accompanies their operation; and from the common observation of children being purged by the milk, if the nurse has taken a cathartic. Some of them, particularly hellebore, are said to purge, if only applied externally in issue.—Purgatives, even of the more powerful kind, exhibited in suitable small doses, in conjunction with the milder aperients, may be introduced into the habit, so as to prove notable deobstruents, diuretics, and diaphoretics, without acting sensibly by stool.

A CATALOGUE of the SIMPLES used in the MATERIA MEDICA, exhibiting at one view their TECHNICAL NAMES, ENGLISH NAMES, PARTS USED IN MEDICINE, VIRTUES, and the different PREPARATIONS FROM THEM.—The particular methods of making the Preparations and all Compound Medicines are shown under the article PHARMACY.

| TECHNICAL NAMES.  | ENGLISH NAMES.        | PARTS USED IN MEDICINE.    | VIRTUES.                                       | PREPARATIONS FROM THEM.  |
|---|-----------------------|----------------------------|--|--|
| <i>Abies ruber</i> , ( <i>Pinus abies</i> , Lin.)                 | The fir-tree.         | The wood, tops, and cones. | Diuretic and diaphoretic.                      | A decoction.   |
| <i>Abrotanum fœmina</i> ( <i>Santolin, chamaecypar</i> , Lin.)    | Lavender cotton.      | The leaves.                | Stimulant, detergent, and antihelmintic.       | Decoction.   |
| <i>Abrotanum mas</i> , ( <i>Artemisia abrotanum</i> , Lin.)       | Southernwood.         | The leaves.                | Stimulant, detergent, aperient, and sudorific. | Decoction.   |
| <i>Abusinthium Romanum</i> ( <i>Artemisia pont.</i> Lin.)         | Roman wormwood.       | The leaves and tops.       | Stomachic.                                     | } An oil, extract of conserve, and several distilled waters. They also enter the common fomentation and green oil. |
| <i>Abusinthium vulgare</i> ( <i>Artemisia abusinthium</i> , Lin.) | Common wormwood.      | The leaves.                | Stomachic.                                     |  |
| <i>Acacia Germanica</i> ( <i>Prunus spinosa</i> , Lin.)           | The sloe.             | Infusated juice.           | Astringent.                                    |  |
| <i>Acacia vera</i> ( <i>Mimosia nilotica</i> , Lin.)              | Acacia.               | Infusated juice.           | Astringent.                                    |  |
| <i>Acetosa</i> , ( <i>Rumex acetos.</i> Lin.)                     | Sorrel.               | Juice.                     | Astringent and antiscorbutic.                  | An essential salt for taking out spots in clothes.   |
| <i>Acetosiella</i> ( <i>Oxalis acetoscl.</i> Lin.)                | Wood sorrel.          | The leaves.                | Astringent and antiscorbutic.                  | A conserve.  |
| <i>Acetum</i> .   | Vinegar.              |                            | Cordial and refrigerant.                       | A distilled spirit.  |
| <i>Aconitum</i> ( <i>Aconit. napell.</i> Lin.)                    | Wolf's-bane.          | The leaves.                | Narcotic.                                      |  |
| <i>Adiantum verum</i> ( <i>Adiant. capill. Ven.</i> Lin.)         | Maiden-hair.          | The leaves.                | Attenuating and aperient.                      | Decoction.   |
| <i>Aër dephlogisticus</i> .                                       | Dephlogisticated air. |                            | Supposed to be antiseptic and corroborative.   |  |



| List of<br>Simples. | TECHNICAL NAMES.   | ENGLISH NAMES.   | PARTS USED IN<br>MEDICINE.         | VIRTUES.                                  | PREPARATIONS FROM THEM.   |
|---------------------|--|--|------------------------------------|---|---|
|                     | Aparine, ( <i>Gallium<br/>aparine</i> , Lin.)                | Goosegrafs, or cli-<br>vers.                               | The leaves.                        | Aperient.                                 |   |
|                     | Apis.  | The bee.   | The whole insect<br>powdered.      | Diuretic.                                 |   |
|                     | Apium, ( <i>Apium<br/>graveol.</i> Lin.)                     | Smallage.  | The roots.                         | Carmivative.                              |   |
|                     | Aqua ferrata.  | Water in which hot<br>iron hath been<br>quenched.          |                                    | Tonic.                                    |   |
|                     | Aqua marina.   | Sea-water.   |                                    | Cathartic and alte-<br>rative.            |   |
|                     | Aquæ minerales.  | Mineral waters.  |                                    | Tonic and altera-<br>tive.                |   |
|                     | Aquæ sulphureæ.  | Sulphureous wa-<br>ters.                                   |                                    | Alterative.                               |   |
|                     | Argentina, ( <i>Po-<br/>tentill. argentin.</i><br>Lin.)      | Silverweed.  | The leaves.                        | Corroborant.                              |   |
|                     | Argentum vivum.  | Quickfilver.   |                                    | A most powerful al-<br>terant.            | Several chemical preparations;<br>see CHEMISTRY, n <sup>o</sup> 154,<br>207, 251, 256, 417, 421.<br>An ingredient in several o-<br>ther officinal preparations. |
|                     | Aristolochia longa,<br>rotunda, et te-<br>nuis.              | Birthwort.   | The roots.                         | Attenuating and<br>stimulant.             |   |
|                     | Armeniaca, ( <i>Pru-<br/>nus Armeniac.</i><br>Lin.)          | The plum-tree.   | The fruit.                         | Refrigerant.                              |   |
|                     | Arsenicum.   | Arsenic.   |                                    | Corrosive.                                |   |
|                     | Artemisia, ( <i>Arte-<br/>misia vulg.</i> Lin.)              | Mugwort.   | The leaves.                        | Antispasmodic.                            | Infusion.   |
|                     | Aruin.   | Wake-robin.  | The root.                          | Stimulant.                                | A compound powder.  |
|                     | Afarum.  | Afarabacca.  | The roots and<br>leaves.           | Errhine, cathartic,<br>and emetic.        | A compound powder.  |
|                     | Asparagus.   | Asparagus.   | The root.                          | Supposed diuretic,<br>but uncertain.      |   |
|                     | Asperula.  | Woodruff.  | The flowers.                       | Attenuant and ape-<br>rient.              |   |
|                     | Asphodelus.  | Asphodel, or king's<br>pear.                               | The roots.                         | Emollient and sup-<br>purative.           |   |
|                     | Atriplex, ( <i>Cheno-<br/>pode. vulcar.</i><br>Lin.)         | Stinking orach.  | The leaves.                        | Antispasmodic.                            | A spirituous tincture, decoction, or conserve, recommended by Tournefort and others.  |
|                     | Avena.   | Oats.  | The grain.                         | Emollient.                                | Decoction.  |
|                     | Aura electrica.  | Electricity.   |                                    | A violent stimulant.                      |   |
|                     | Aurantia curflaven-<br>fia.                                  | Curaslow oranges,<br>or apples.                            | The fruit.                         | Stomachic.                                | Ingredients in several Roma-<br>chic tinctures.   |
|                     | Aurantium, ( <i>Citrus<br/>aurant.</i> Lin.)                 | The orange.  | The leaves, fruit,<br>and flowers. | Cordial, stomachic,<br>and refrigerant.   | An essential oil, a distilled wa-<br>ter, and a conserve.   |
|                     | Auricula Judæ,<br>( <i>Tramell. verruc.</i><br>Lin.)         | Jews-ears.   | The whole.                         | Purgative, or astrin-<br>gent; uncertain. |   |
|                     | Auripigmentum.   | Orpiment.  |                                    | Corrosive, but less<br>so than arsenic.   |   |
|                     | Auxungia viperina.   | Viper's fat.   |                                    | Emollient.                                |   |
|                     | Balaustia, ( <i>Punica<br/>granat.</i> Lin.)                 | Balaustine, or dou-<br>ble-flowered po-<br>megranate tree. | The flowers.                       | Astringent.                               | Ingredient in a powder.   |
|                     | Balsamita, ( <i>Tana-<br/>cetum balsami-<br/>num</i> , Lin.) | Costmary.  | The leaves.                        | Aromatic.                                 |   |



| TECHNICAL NAMES.   | ENGLISH NAMES.                                  | PARTS USED IN<br>MEDICINE. | VIRTUES.  | PREPARATIONS FROM THEM.  | List of<br>Simples. |
|--|---|----------------------------|---|--|---------------------|
| Balsamum Cana-<br>denfe.   | Balm of Canada.                                 |                            | Diuretic and tonic.   |  |                     |
| Balsamum Copay-<br>væ.   | Balm of Copivi.                                 |                            | Diuretic and tonic.   | An empyreumatic oil, and an ingredient in some tinctures.                                |                     |
| Balsamum Gilea-<br>denfe.  | Opobalsam, or balm<br>of Gilead.                |                            | Said to be a most ex-<br>traordinary vul-<br>nerary.                                    |  |                     |
| Balsamum Peruvia-<br>num.  | Balm of Peru.                                   |                            | A fine warm aro-<br>matic.  | An ingredient in many tinc-<br>tures, and some ointments.                                |                     |
| Balsamum Toluta-<br>num.   | Balm of Tolu.                                   |                            | Aromatic and cor-<br>roborant.  | An ingredient in several tinc-<br>tures, elixirs, and a kind of<br>pectoral pills.       |                     |
| Bardana major,<br>( <i>Arctium lappa</i> ,<br>Lin.)              | Burdock.  | The roots and<br>seeds.    | Aperient, diuretic,<br>and diaphoretic.   | Decoction.   |                     |
| Bechen album,<br>( <i>Centaurea be-<br/>chen</i> , Lin.)         |   | The root.                  | Stimulant.  |  |                     |
| Bechen rubrum,<br>( <i>Statice limon</i> ,<br>Lin.)              |   | The root.                  | Stimulant.  |  |                     |
| Belladonna, ( <i>Atroph.</i><br><i>belladon</i> . Lin.)          | Deadly night-<br>shade.                         | The juice.                 | Narcotic.   | An extract of the juice.   |                     |
| Bellis minor, ( <i>Bell.</i><br><i>peren</i> . Lin.)             | Common daisy.                                   | The leaves.                | Attenuant.  |  |                     |
| Berberis, ( <i>Berber.</i><br><i>vulgar</i> . Lin.)              | Barberry.                                       | The bark and fruit.        | Astringent.   | A jelly.   |                     |
| Beta, ( <i>Bet. vulg.</i><br>Lin.)                               | The beet.                                       | The leaves.                | Cathartic and er-<br>rhine.   |  |                     |
| Betonica.  | Betony.   | The leaves.                | Corroborant.  |  |                     |
| Bezoar.  | Bezoar-stone.                                   |                            | Many virtues false-<br>ly ascribed to it;<br>now found to be<br>only an absorb-<br>ent. |  |                     |
| Bilis animalis.  | The gall or bile of<br>animals.                 |                            | Cathartic.  |  |                     |
| Bistorta, ( <i>Polygon.</i><br><i>bistort</i> . Lin.)            | Bistort or snake-<br>wort.                      | The roots.                 | Powerfully astring-<br>ent.   | An ingredient in a powder.   |                     |
| Bolus Armena.  | Armenian bole.                                  |                            | Astringent.   | An ingredient in several pow-<br>ders.   |                     |
| Bolus Gallica.   | French bole.                                    |                            | Astringent and<br>slightly absorb-<br>ent.  | An ingredient in some pow-<br>ders.  |                     |
| Bonus Henricus,<br>( <i>Chenopod. bon.</i><br><i>Hen</i> . Lin.) | English mercury,<br>all-good, or good<br>Henry. | The leaves.                | Laxative.   |  |                     |
| Borax.   | Tincar, or borax.                               | The whole.                 | Diuretic and em-<br>menagogue.  | An ingredient in a powder, and<br>a salt prepared from it. See<br>CHEMISTRY, n° 265—272. |                     |
| Branca ursina, ( <i>A-<br/>canth. moll</i> . Lin.)               | Bear's-breech.                                  | The root.                  | Emollient.  |  |                     |
| Brassica, ( <i>Brassica</i> ,<br><i>olerac</i> . Lin.)           | Cabbage.  | The leaves.                | Refrigerant and<br>laxative   |  |                     |
| Brionia alba.  | White briony.                                   | The root.                  | Discentient and vio-<br>lently cathartic.   |  |                     |
| Bucabunga, ( <i>Ve-<br/>ronica bucabung.</i><br>Lin.)            | Brooklime.                                      | The leaves.                | Attenuant and an-<br>tiscorbatic.   |  |                     |
| Burfa pastoris,<br>( <i>Thlaspi burfa</i> ,<br>Lin.)             | Shepherd's purse.                               | The leaves.                | Astringent, but very<br>doubtful.   |  |                     |

| LIST OF<br>SIMPLES. | TECHNICAL NAMES.   | ENGLISH NAMES.                      | PARTS USED IN<br>MEDICINE.                    | VIRTUES.  | PREPARATIONS FROM THEM.  |
|---------------------|--|-------------------------------------|---|---|--|
|                     | Cacao, ( <i>Theobroma cacao</i> , Lin.)                            | Chocolate tree.                     | The fruit.                                    | Analeptic.  | Chocolate.   |
|                     | Calamintha, ( <i>Me-<br/>lissa calamintha</i> ,<br>Lin.)           | Calamint.                           | The leaves.                                   | Aromatic and sti-<br>lant.  |  |
|                     | Calamus aromati-<br>cus, ( <i>Acor. ver.</i><br>Lin.)              | Sweet-scented flag.                 | The roots.                                    | Aromatic and flo-<br>machic.  |  |
|                     | Calendula.   | Garden marigold.                    | The flowers.                                  | Attenuating and fu-<br>dorific, but very<br>doubtful.                 |  |
|                     | Calx viva.   | Quicklime.                          |   | A violent corrosive,<br>and powerful al-<br>terant and ab-<br>sorber. | A medicated water.   |
|                     | Camphor, ( <i>Laur.<br/>camphor</i> , Lin.)                        | Camphire tree.                      | The concreted ef-<br>fential oil.             | Refrigerant and di-<br>aphoretic.                                     | A solution in rectified spirit, in<br>expressed and essential oils.<br>Ingredient in many other<br>compositions. |
|                     | Canella alba.  | White cinnamon,<br>or canella alba. | The bark.                                     | Aromatic and sti-<br>mulant.  | An ingredient in several tinc-<br>tures.   |
|                     | Cannabis.  | Hemp.                               | The seeds.                                    | Aperient and re-<br>frigerant, but<br>doubtful.                       | Decoctions and infusions.  |
|                     | Cantharides.   | Spanish-flies.                      |   | Violently stimula-<br>ting and vesica-<br>tory.                       | A spirituous tincture.   |
|                     | Caparis, ( <i>Capar.<br/>spinos</i> , Lin.)                        | Caper-bush.                         | The bark of the<br>root, and flower-<br>buds. | Aperient and flo-<br>machic.  | Pickled.   |
|                     | Caprifolium, ( <i>Leo-<br/>niceracaprif</i> , Lin.)                | Woodbind, or ho-<br>neyfuckle.      | The leaves and<br>flowers.                    | Aperient and diu-<br>retic.   |  |
|                     | Cardamines, ( <i>Car-<br/>damine pratens</i> ,<br>Lin.)            | Cardamine.                          | The flowers.                                  | Antispasmodic.  |  |
|                     | Cardamomum ma-<br>jus, ( <i>Amom. car-<br/>dam</i> , Lin.)         | Greater cardamom.                   | The seeds.                                    | Aromatic and sti-<br>mulant.  | } A spirituous water and<br>tincture. Ingredient also<br>in several official com-<br>positions.                  |
|                     | Cardamomum mi-<br>nus, ( <i>Amom. car-<br/>dam</i> , Lin.)         | Lesser cardamom.                    | The seeds.                                    | Aromatic and sti-<br>mulant.  |  |
|                     | Cardiaca, ( <i>Cardiac.<br/>leonur</i> , Lin.)                     | Mother-wort.                        | The leaves.                                   | Antispasmodic.  |  |
|                     | Cardus benedictus,<br>( <i>Centaur. bene-<br/>dict</i> , Lin.)     | Blessed-thistle.                    | The leaves and<br>seed.                       | Stomachic.  | An ingredient in a stomachic<br>tincture.  |
|                     | Carlina, ( <i>Carlina<br/>acaul</i> , Lin.)                        | Carlina-thistle.                    | The root.                                     | Diaphoretic.  |  |
|                     | Carthamus, ( <i>Car-<br/>tham. tinct</i> , Lin.)                   | Barbary saffron.                    | The seeds.                                    | Cathartic.  |  |
|                     | Carum, ( <i>Carum<br/>carvi</i> , Lin.)                            | Caraway.                            | The seeds.                                    | Aromatic.   | An essential oil, a spirituous<br>water. Ingredient also in<br>many official compositions.                       |
|                     | Caryophyllata,<br>( <i>Geum urban</i> ,<br>Lin.)                   | Avens, or herb<br>benet.            | The root.                                     | Aromatic.   | An essential oil.  |
|                     | Caryophyllus aro-<br>maticus.                                      | The clove-tree.                     | The flower-cups.                              | Strongly aromatic.  | An essential oil. Ingredient<br>also in many official com-<br>positions.   |
|                     | Caryophyllus ru-<br>ber, ( <i>Dianth. ca-<br/>ryophyll</i> , Lin.) | Clove July-flowers.                 | The flowers.                                  | Aromatic.   | A syrup.   |
|                     | Cascarilla, ( <i>Croton<br/>cascar</i> , Lin.)                     | Cascarilla.                         | The bark.                                     | Aromatic and sti-<br>mulant.  | Infusions.   |

| TECHNICAL NAMES.  | ENGLISH NAMES.                     | PARTS USED IN<br>MEDICINE.         | VIRTUES.  | PREPARATIONS FROM THEM.   |
|---|------------------------------------|------------------------------------|---|---|
| <i>Cassia fistularis.</i>   | Cassia.                            | The fruit.                         | Purgative.                                      | An ingredient in two electuaries.   |
| <i>Cassialignea, (Laurus cassia, Lin.)</i>                        | Cassia.                            | The bark.                          | Aromatic.                                       |   |
| <i>Cassumunar.</i>  | Cassumar.                          | The root.                          | Stomachic and carminative.                      |   |
| <i>Castoreum, (Castor fiber, Lin.)</i>                            | Castor.                            |                                    | Nervine and antispasmodic.                      | A simple water; a spirituous water; a tincture. Ingredient in many official compositions. |
| <i>Cataputia major, vel palma Christi, (Ricinus commun. Lin.)</i> | Palma Christi.                     | The seeds.                         | Purgative.                                      | An expressed oil.   |
| <i>Cataputia minor, vel tithymalus, (Euphorb. lithyr. Lin.)</i>   | Broad-leaved spurge, or cataputia. | The juice.                         | Violently inflammatory.                         | Inspissated juice.  |
| <i>Celeri, (Apium graveolens, Lin.)</i>                           | Celery.                            | The leaves.                        | Laxative.                                       |   |
| <i>Centaureum minus, (Gentian. centaur. Lin.)</i>                 | Lesser centaury.                   | The tops.                          | Stomachic.                                      | Ingredient in some tinctures and infusions.   |
| <i>Cepa, (Allium cepa, Lin.)</i>                                  | The onion.                         | The roots.                         | Attenuating and diuretic.                       |   |
| <i>Cera alba.</i>   | White wax.                         |                                    | Emollient.                                      | Ingredient in many plasters and ointments.  |
| <i>Cera flava.</i>  | Yellow wax.                        |                                    | Emollient.                                      | Ingredient in almost all ointments.   |
| <i>Cerasus, (Prunus cerasus, Lin.)</i>                            | The cherry-tree.                   | The fruit.                         | Refrigerant.                                    |   |
| <i>Ceterach, (Asplen. ceterach, Lin.)</i>                         | Spleenwort.                        | The leaves.                        | Diuretic.                                       |   |
| <i>Chamædrys, (Teucrium chamædr. Lin.)</i>                        | Germander.                         | The leaves and tops with the seed. | Sudorific and diuretic.                         |   |
| <i>Chamæmelum, (Anthemis nobilis, Lin.)</i>                       | Camomile.                          | The flowers.                       | Stomachic, carminative, and emollient.          | An essential oil, a simple water, and extract.  |
| <i>Chamæpithys, (Teucrium chamaepit. Lin.)</i>                    | Ground-pine.                       | The leaves.                        | Aperient.                                       |   |
| <i>Cheiri, seu Leucolum luteum, (Cheiranth. cheiri, Lin.)</i>     | Wallflower.                        | The flower.                        | Aperient, cordial, and attenuant.               |   |
| <i>Chela cancrorum.</i>   | Crab's claws.                      |                                    | Aborbent.                                       | Levigated.  |
| <i>Chelidonium majus.</i>   | Commoncelandine.                   | The leaves and roots.              | Inflammatory.                                   |   |
| <i>Chelidonium minus, (Ranunc. ficar. Lin.)</i>                   | Pilewort.                          | The leaves and root.               | Emollient.                                      |   |
| <i>China, (Smilax China, Lin.)</i>                                | China.                             | The root.                          | Diaphoretic and diuretic.                       |   |
| <i>Cicer, (Cicer arietin. Lin.)</i>                               | Red chices, or chick peas.         | The seeds.                         | Lithonatriptic and diuretic, but very doubtful. |   |
| <i>Cichorium, (Cichor. intyb. Lin.)</i>                           | Wild succory.                      | The roots and leaves.              | Laxative and antiscorbutic.                     |   |
| <i>Cicuta major, (Conium maculat. Lin.)</i>                       | Hemlock.                           | The leaves.                        | Resolvent and alterant.                         |   |



| List of<br>Simples. | TECHNICAL NAMES.  | ENGLISH NAMES.                    | PARTS USED IN<br>MEDICINE.   | VIRTUES.   | PREPARATIONS FROM THEM.  |
|---------------------|---|-----------------------------------|--|--|--|
|                     | Cinnamomum,<br>( <i>Laurus cinnam.</i><br>Lin.)                   | The cinnamon tree.                | The bark.  | Aromatic and cor-<br>roborant.                       | An essential oil, a simple and<br>spirituous distilled water,<br>and an ingredient in a great<br>number of compositions. |
|                     | Clematis.   | Virgin's bower.                   | The root.  | Pugative.  |  |
|                     | Coccinella, ( <i>Coccus</i><br><i>cacti</i> , Lin.)               | Cochineal.                        |  | Sudorific, but chief-<br>ly used for co-<br>louring. |  |
|                     | Cocculus Indicus,<br>( <i>Menisperm. co-</i><br><i>cul.</i> Lin.) | Indian berry.                     | The fruit.   | Narcotic.  |  |
|                     | Cochlearia.   | Scurvy-grafs.                     | The leaves.  | Stimulating and<br>attenuant.                        | A conserve and spirit. An in-<br>gredient in some other offi-<br>cinal preparations.                                     |
|                     | Coffea.   | The coffee-tree.                  | The fruit.   | Stomachic and cor-<br>roborant.                      | A decoction.   |
|                     | Colchicum, ( <i>Col-</i><br><i>chic. autumnal.</i><br>Lin.)       | Meadow saffron.                   | The root.  | Powerfully diure-<br>tic.                            | A syrup and oxymel.  |
|                     | Colocynthis, ( <i>Cu-</i><br><i>cum. colocynth.</i><br>Lin.)      | Coloquintida, or<br>bitter-apple. | The medullary part<br>of the dried fruit.  | Violently cathartic.                                 | An ingredient in some cathar-<br>tic pills and extracts.   |
|                     | Columbo.  | Columbo.                          | The root.  | A most excellent<br>antiseptic and<br>stomachic.     | A vinous tincture.   |
|                     | Confolida major,<br>( <i>Symphyt. officin.</i><br>Lin.)           | Comfrey.                          | The root.  | Emollient.   |  |
|                     | Contrayerva, ( <i>Dor-</i><br><i>stenia</i> , Lin.)               | Contrayerva.                      | The root.  | Aromatic and dia-<br>phoretic.                       | Gives name to a powder, and<br>is an ingredient in the the-<br>riaca.  |
|                     | Corallina, ( <i>Sertu-</i><br><i>laria</i> , Lin.)                | Coralline.                        |  | Absorbent.   |  |
|                     | Corallium rubrum.   | Red coral.                        |  | Absorbent.   |  |
|                     | Coriandrum, ( <i>Cori-</i><br><i>andr. sativ.</i> Lin.)           | Coriander.                        | The seeds.   | Carminative and<br>stomachic.                        | An ingredient in several offi-<br>cinal compositions.  |
|                     | Cornu cervi.  | Hartthorn.                        |  | Emollient and nu-<br>trititious.                     | Shavings, a jelly, a volatile al-<br>kaline salt and spirit, and<br>an empyreumatic oil.                                 |
|                     | Cornu cervi calci-<br>natum.                                      | Calcined or burnt<br>hartthorn.   |  | Absorbent.   |  |
|                     | Coitus, ( <i>Cost. Arab.</i><br>Lin.)                             | Coitus.                           | The root.  | Attenuant and diu-<br>retic.                         |  |
|                     | Cotula fetida.  | May-weed, or wild<br>chamomile.   | The leaves.  | Antispasmodic.                                       |  |
|                     | Crassula.   | Orpine.                           | The leaves.  | Emollient and a-<br>stringent.                       |  |
|                     | Creta alba.   | White chalk.                      |  | Absorbent.   |  |
|                     | Crithmum.   | Samphire.                         | The leaves.  | Aperient, stoma-<br>chic, and diu-<br>retic.         |  |
|                     | Crocus.   | Saffron.                          | The chives, or<br>fleshy capilla-<br>ments growing<br>at the end of<br>the flower. | Aromatic and cor-<br>dial.                           | A spirituous tincture; a vi-<br>nous tincture; a syrup; and<br>an ingredient in many offi-<br>cinal compositions.        |
|                     | Cubebæ, ( <i>Piper</i> ,<br>Lin.)                                 | Cubebs.                           | The fruit.   | Aromatic and sti-<br>mulant.                         | An ingredient in several offi-<br>cinal compositions.  |
|                     | Cucumis hortenſis.  | The garden cucum-<br>ber.         | The seeds.   | Refrigerant.   |  |
|                     | Cucumis agrestis.   | Wild cucumber.                    | The fruit.   | Violently cathartic.                                 | The juice inspissated.   |
|                     | Cucurbita.  | The gourd and<br>pompion.         | The seeds.   | Refrigerating.                                       | An expressed oil.  |

| TECHNICAL NAMES.                                    | ENGLISH NAMES.                                | PARTS USED IN MEDICINE.            | VIRTUES.                                    | PREPARATIONS FROM THEM.   |
|---|---|------------------------------------|---|---|
| Cupressus.  | The cypress.                                  | The fruit.                         | A strong astringent.                        |   |
| Cuprum.   | Copper.                                       |                                    | A violent emetic, diuretic, and alterative. | Calced, and producing salts by combination with several acids, and with volatile alkali. See CHEMISTRY, n° 142, 200, 278, 298, 332. |
| Curcuma, ( <i>Curcum. long.</i> Lin.)               | Tumeric.                                      | The root.                          | Aromatic, aperient, and emmenagogue.        |   |
| Cydonia.  | The quince.                                   | The fruit and seeds.               | Stomachic and corroborative.                | A syrup and jelly of the fruit, and mucilage of the seeds.  |
| Cuminum.  | Cumin.  | The seeds.                         | Aromatic and antispasmodic.                 | An essential oil, and an ingredient in some official compositions.  |
| Cynoglossum.  | Hound's tongue.                               | The root.                          | Narcotic, but doubtful.                     |   |
| Cynobatum, ( <i>Rosa canin.</i> Lin.)               | The wild briar, dog-rose, or hip-tree.        | The fruit and flowers.             | Refrigerant and antiscorbatic.              | A distilled water and conserve.   |
| Cyperus longa.                                      | Long cyperus.                                 | The root.                          | Aromatic and carminative.                   |   |
| Dactylus, ( <i>Phoenix dactylif.</i> Lin.)          | The date-tree.                                | The fruit.                         | Emollient and slightly astringent.          |   |
| Daucus Creticus, ( <i>Athamant. Cretenf.</i> Lin.)  | Candy carrot.                                 | The seeds.                         | Aromatic.                                   | Ingredient in mithridate and theriaca.  |
| Daucus fativus, ( <i>Daucus carota</i> , Lin.)      | The carrot.                                   | The roots.                         | Powerfully antiscipitic.                    | A poultice from them for cancers, and a marmalade.  |
| Daucus silvestris.                                  | Wild carrot.                                  | The seeds.                         | Aromatic.                                   |   |
| Dens leonis, ( <i>Leonod. tarax.</i> Lin.)          | Dandelion.                                    | The root and herb.                 | Attenuant, but doubtful.                    |   |
| Dictamnus Creticus, ( <i>Dictamn. origan.</i> Lin.) | Dittany of Crete.                             | The leaves.                        | Aromatic.                                   | An essential oil; and ingredient in several official powders.   |
| Digitalis.  | Fox-glove.                                    | The leaves.                        | Emetic and cathartic.                       |   |
| Doronicum Germanicum, ( <i>Arnica montan.</i> Lin.) | German leopardsbane.                          | The leaves and roots.              | Violently emetic and cathartic.             |   |
| Dulcamara, ( <i>Solan. dulcamar.</i> Liu.)          | Bitter, sweet, or woody nightshade.           | The herb and root.                 | Diaphoretic, attenuant, and cathartic.      |   |
| Ebulus, ( <i>Sambuc. ebul.</i> Lin.)                | Dwarf-elder, or Danewort.                     | The root, bark, leaves, and fruit. | Strongly cathartic.                         | A rob from the berries.   |
| Elatine, ( <i>Veronica officinal.</i> Lin.)         | Flucclin, or female speedwell.                | The leaves.                        | Diuretic and attenuant.                     | Gives name to one of the official honeys.   |
| Eleutheria. See CASCARILLA.                         |   |                                    |   |   |
| Endivia, ( <i>Cichor. endiv.</i> Lin.)              | Endive.                                       | The leaves and roots.              | Aperient and refrigerant.                   |   |
| Erigerum.   | Groundsel.                                    | The leaves.                        | Emetic.                                     |   |
| Eruca.  | Rocket.                                       | The seeds.                         | Stimulant.                                  |   |
| Eryngium, ( <i>Eryng. maritim.</i> Lin.)            | Eryngo, or sea-holly.                         | The root.                          | Aperient and diuretic.                      |   |
| Erysimum, ( <i>Erysim. officinal.</i> Lin.)         | Hedge-mustard.                                | The leaves.                        | Attenuant and diuretic.                     |   |
| Eupatorium cannabinum.                              | Hemp-agrimony, water-agrimony, or water-hemp. | The leaves.                        | Attenuant and corroborant.                  |   |

| LIST OF<br>SIMPLES. | TECHNICAL NAMES.  | ENGLISH NAMES.               | PARTS USED IN<br>MEDICINE.       | VIRTUES.  | PREPARATIONS FROM THEM.   |
|---------------------|---|------------------------------|----------------------------------|---|---|
|                     | Faba Indica, feu<br>Sancti Ignatii.   | St Ignatius's bean.          | The seeds.                       | Antispasmodic.                                      |   |
|                     | Faba vicia.   | The garden-bean.             | The seeds and flow-<br>ers.      | Nutritive and col-<br>metic.                        | A distilled water from the<br>flowers.  |
|                     | Fagopyrum, ( <i>Po-<br/>lyg. fagopyr.<br/>Lin.</i> )                            | Snakeweed.                   | The seeds.                       | Refrigerant.  |   |
|                     | Farina tritici vel<br>avenæ.  | Bran.                        |                                  | Discutient.   |   |
|                     | Ferrum.   | Iron.                        |                                  | Corroborative and<br>alterant.                      | Infusions in wine; the metal<br>reduced to a calx by rust,<br>or by fire, and some salts<br>produced from it by combi-<br>nations with different acids.<br>See CHEMISTRY, n° 146,<br>242—245, 279, 299. |
|                     | Fæx vini rubri.   | Lees of red wine.            |                                  | Discutient and re-<br>pellent.                      |   |
|                     | Ficus, ( <i>Ficus caric.<br/>Lin.</i> )   | The fig-tree.                | The fruit.                       | Emollient and sup-<br>purative.                     |   |
|                     | Filipendula, ( <i>Spie-<br/>rea filipend.<br/>Lin.</i> )                        | Common dropwort.             | The root.                        | Astringent and cor-<br>roborant.                    |   |
|                     | Filix mas, ( <i>Polypod.<br/>Filix, Lin.</i> )                                  | The male fern.               | The leaves and root.             | Anthelmintic and<br>deobstruent.                    |   |
|                     | Flores cerevisiæ.   | Yeast.                       |                                  | Inflammatory.                                       |   |
|                     | Fœnum Græcum,<br>( <i>Trigonell. fœn.<br/>græc. Lin.</i> )                      | Fenugreek.                   | The seed.                        | Emollient.  |   |
|                     | Fœniculum dulce et<br>vulgare, ( <i>Aneth.<br/>fœnic. Lin.</i> )                | Sweet and common<br>fennel.  | The seeds, roots,<br>and leaves. | Aromatic, stimu-<br>lant, and carmi-<br>native.     | An essential oil.   |
|                     | Fœniculum aquati-<br>cum, <i>Pharmac.<br/>Ross. (Phelland.<br/>aquat. Lin.)</i> | Waterwort.                   | The leaves and<br>seeds.         | Corroborant.  |   |
|                     | Formica, ( <i>Formica<br/>rufa, Lin.</i> )                                      | The ant.                     | The whole insect.                | Stimulant.  | An oil and acid spirit.   |
|                     | Fragaria, ( <i>Fragar.<br/>vesc. Lin.</i> )                                     | The strawberry<br>bush.      | The leaves and<br>fruit.         | Astringent, corro-<br>borant, and refri-<br>gerant. |   |
|                     | Frangula, ( <i>Alnus<br/>nigr. Lin.</i> )                                       | Black alder.                 | The bark.                        | Violently cathartic,                                |   |
|                     | Fraxinella, ( <i>Dic-<br/>tamnus albus,<br/>Lin.</i> )                          | White or bastard<br>dittany. | The root.                        | Diaphoretic.  |   |
|                     | Fraxinus, ( <i>Fraxin.<br/>excelsior, Lin.</i> )                                | The ash-tree.                | The bark and seeds.              | Astringent and sti-<br>mulant.                      |   |
|                     | Fuligo ligni splen-<br>dens.  | Shining woodfoot.            |                                  | Antispasmodic.                                      | A spirituous tincture.  |
|                     | Fumaria.  | Fumitory.                    | The leaves.                      | Stimulating and at-<br>tenuant.                     |   |
|                     | Fungus melitenfis,<br><i>Pharmac. Ross.<br/>(Cynomor. coc-<br/>cin. Lin.)</i>   |                              |                                  |   |   |
|                     | Galanga minor,<br>( <i>Marant. ga-<br/>lang. Lin.</i> )                         | Galangal.                    | The root.                        | Stomachic.  |   |
|                     | Galega.   | Goat's rue.                  | The herb.                        | Diaphoretic, but<br>very doubtful.                  |   |
|                     | Gallæ.  | Galls.                       |                                  | Astringent.   |   |



| TECHNICAL NAMES.  | ENGLISH NAMES.  | PARTS USED IN MEDICINE.            | VIRTUES.  | PREPARATIONS FROM THEM.   |
|---|---|------------------------------------|---|---|
| Gallium luteum,<br>( <i>Gall. ver.</i> Lin.)                  | Yellow ladies bed-<br>straw, or checke-<br>rennet.                    | The tops.                          | Astringent.                                       |   |
| Genista, ( <i>Genif.<br/>tinctor.</i> Lin.)                   | Broom.  | The leaves, flowers,<br>and seeds. | Diuretic and ca-<br>thartic.                      |   |
| Gentiana alba,<br>( <i>Laserpitium la-<br/>tifol.</i> Lin.)   | Lefferwort.   | The root.                          |   |   |
| Gentiana, ( <i>Gent-<br/>tian. lut.</i> Lin.)                 | Common gentian.   | The root.                          | Stomachic and sti-<br>mulant.                     | A spirituous tincture, and an<br>ingredient in many official<br>compositions.                       |
| Geranium Rober-<br>tium.                                      | Herb Robert.  | The leaves.                        | Astringent, but<br>very doubtful.                 |   |
| Ginseng, ( <i>Panax<br/>quinquefol.</i> Lin.)                 | Ginseng.  | The root.                          | Stimulant and cor-<br>roborant.                   |   |
| Gladiolum lu-<br>teum, ( <i>Iris pseu-<br/>dacorus.</i> Lin.) | Yellow water-flag,<br>bastard acorus, or<br>water flower-de-<br>luxe. | The roots.                         | Strongly cathartic.                               |   |
| Glycyrrhiza, ( <i>Gly-<br/>cy. glabr.</i> Lin.)               | Liquorice.  | The root.                          | Emollient and pec-<br>toral.                      | An extract and powder. An<br>ingredient in many official<br>compositions.                           |
| Gramen caninum,<br>( <i>Triticum repens.</i><br>Lin.)         | Quick-grass.  | The roots.                         | Aperient.   |   |
| Grana paradisi,<br>( <i>Amomum.</i> Lin.)                     | Grains of paradise.   | The seeds.                         | Aromatic and sti-<br>mulant.                      |   |
| Granatum, ( <i>Punica<br/>granatum.</i> Lin.)                 | The pomegranate.  | The fruit and bark.                | Refrigerant and<br>astringent.                    |   |
| Gratiola.   | Hedge-hyssop.   | The leaves and<br>root.            | Emetic and cathar-<br>tic.                        |   |
| Guajacum.   | Lignum-vitæ, or<br>guajacum.  | The wood and<br>bark.              | Aperient, stimu-<br>lant, and corro-<br>borative. | An extract, two tinctures,<br>and a gummy resin. An<br>ingredient in many official<br>preparations. |
| Gummi arabicum.   | Gum-arabic.   |                                    | Astringent and mu-<br>cilaginous.                 | An ingredient in a great num-<br>ber of official composi-<br>tions.                                 |
| Gum. ammoniacum   | Gum ammoniac.   |                                    | Aperient, antispas-<br>modic, and emol-<br>lient. | A solution. An ingredient in<br>several pectoral composi-<br>tions.                                 |
| Gum. asafœtida.   | Asafœtida.  |                                    | A powerful anti-<br>spasmodic.                    | An ingredient in very many<br>official compositions.  |
| Gum. bdellium.  | Bdellium.   |                                    | Sudorific, diuretic,<br>and emollient.            |   |
| Gum. benzoin.   | Benzoin.  |                                    | Cosmetic.   | An ingredient in several anod-<br>ync compositions.   |
| Gum. elemi.   | Elemi.  |                                    | Aromatic.   | An essential oil, and gives<br>name to ointment.  |
| Gum. galbanum.  | Galbanum.   |                                    | Antispasmodic.                                    | An ingredient in many anti-<br>hyfteric medicines.  |
| Gum. gambogia.  | Gamboge.  |                                    | Emetic and cathar-<br>tic.                        | Gives name to a certain kind<br>of pills.   |
| Gum. kino.  | Kino.   |                                    | Astringent.                                       |   |
| Gum. labdanum.  | Labdanum.   |                                    | Stomachic.  | An ingredient in the stoma-<br>chic pills and plasters.   |
| Gum. laricia,<br>( <i>Pharm. Ross.</i> )                      |   |                                    |   |   |
| Gum. lacca.   | Gum lac.  |                                    | Astringent.                                       | A tincture.   |
| Gum. mastic.  | Mastic.   |                                    | Corroborant.                                      |   |
| Gum. myrrha.  | Myrrh.  |                                    | Antispasmodic and<br>corroborant.                 | A tincture, and an ingredient<br>in many official composi-<br>tions.                                |

| TECHNICAL NAMES.   | ENGLISH NAMES.                       | PARTS USED IN MEDICINE.         | VIRTUES.                               | [PREPARATIONS FROM THEM.  |
|--|--------------------------------------|---------------------------------|--|---|
| Gum. olibanum.   | Olibanum.                            |                                 | Astringent, but uncertain.             | An ingredient in some powders, and other official compositions. |
| Gum. opoponax.   | Opoponax.                            |                                 | Attenuant and stimulant.               | An ingredient in some official compositions.                    |
| Gum. sanguis draconis.                                     |                                      |                                 | Astringent.                            | An ingredient in some styptic and balsamic medicines.           |
| Gum. Senegal.  |                                      |                                 | Astringent and mucilaginous.           |   |
| Gum. styrax calamit.                                       | Storax.                              |                                 | Stimulant and corroborant.             | An ingredient in some tinctures and pills.                      |
| Gum. styrax liquida  | Liquid storax.                       |                                 |  | Ingredient in a mercurial plaster.                              |
| Gum. thus.   | Frankincense.                        |                                 | Supposed corroborative.                | An ingredient in the theriaca, and some plasters.               |
| Gum. tragacanth.   | Gum tragacanth, commonly gum-dragon. |                                 | Astringent and corroborant.            |   |
| Hæmatites.   | Blood-stone.                         |                                 | Astringent and corroborative.          |   |
| Hedera arborea, (Hederabelix. Lin.)                        | Ivy.                                 | The leaves, berries, and resin. | Diaphoretic.                           |   |
| Hedera terrestris, (Glechom. hederac. Lin.)                | Ground-ivy.                          | The leaves.                     | Aperient and corroborant.              |   |
| Helenium.  | Elecampane.                          | The root.                       | Aperient and peccoral.                 | An ingredient in several official compositions.                 |
| Helleboraster, Pharmac. Brunsvic. (Helleborus fetid. Lin.) |                                      | The root.                       |  |   |
| Helleborus albus, (Veratrum alb. Lin.)                     | White hellebore.                     | The root.                       | Most violently emetic and errhine.     | A tincture and honey.   |
| Helleborus niger.  | Black hellebore.                     | The root.                       | A powerful alterative and emmenagogue. | A tincture and extract.   |
| Helleborus niger, Pharmac. Ross. (Adonis vernal. Lin.)     |                                      | The root.                       |  |   |
| Hepatica nobilis, (Anemone hepatic. Lin.)                  | Noble liver-wort.                    | The leaves.                     | Corroborant.                           |   |
| Hermodactylus, (Iris tuberosa, Lin.)                       | Hermodactyl.                         | The root.                       | Purgative, but doubtful.               |   |
| Herniaria, (Herniar. glab. Lin.)                           | Rupture-wort.                        | The leaves.                     | Astringent.                            |   |
| Hippocastanum, Ph. Ross. (Æscul. hippocast. Lin.)          |                                      | The bark.                       |  |   |
| Hirundinaria, (Aclep. vincetox. Lin.)                      | Swallow-wort, or tame-poison.        | The root.                       | Sudorific, diuretic, and emmenagogue.  | "   |
| Hordeum, (Hord. distich. Lin.)                             | Barley.                              |                                 | Refrigerant.                           | A decoction.  |
| Horminum, (Salv. hormin. Lin.)                             | Garden clary.                        | The leaves and seeds.           | Corroborative.                         |   |
| Hydrolapathum, (Rumex aquat. Lin.)                         | Great water-dock.                    | The leaves and roots.           | Alterant and laxative.                 |   |
| Hyosciamus, (Hyosciam. nig. Lin.)                          | The common wild or black hen-bane.   | The leaves.                     | Narcotic.                              |   |

| TECHNICAL NAMES.   | ENGLISH NAMES.   | PARTS USED IN<br>MEDICINE.      | VIRTUES.  | PREPARATIONS FROM THEM.   | List of<br>Simple |
|--|--|---------------------------------|---|---|-------------------|
| Hypericum, ( <i>Hyperic. perforat.</i> Lin.)             | St John's-wort.  | The leaves, flowers, and seeds. | Diuretic, sudorific, and alterant.  | Gives name to a coloured oil.   |                   |
| Hypocistis, ( <i>Cytisus hypocist.</i> Lin.)             | Hypocistis.  |                                 | Astringent.   | Juice inspissated.  |                   |
| Hyssopus, ( <i>Hyssop. officinal.</i> Lin.)              | Hyssop.  | The leaves.                     | Aromatic.   | A distilled water.  |                   |
| Jalappa, ( <i>Convolv. jalap.</i> Lin.)                  | Jalap.   | The root.                       | Cathartic.  | An extract, a simple tincture, a compound tincture, a resin, and powder.                                      |                   |
| Japonica terra.  | Japan earth.   |                                 | Astringent.   | A tincture, troches, and confection; and an ingredient in several officinal compositions.                     |                   |
| Imperatoria, ( <i>Imper. offrut.</i> Lin.)               | Master-wort.   | The root.                       | Aromatic.   |   |                   |
| Ipecacuanha, ( <i>Vicia ipecac.</i> Lin.)                | Ipecacuanha.   | The root.                       | Emetic and cathartic.   | A vinous tincture, and a powder.  |                   |
| Iris Florentina.   | Florentine orris.  | The root.                       | Aromatic and stimulant.   | An ingredient in several pectoral medicines.  |                   |
| Iris nostras, ( <i>Iris german.</i> Lin.)                | Flower-de-luce.  | The root.                       | The same with the former.   |   |                   |
| Juglans, ( <i>Jug. reg.</i> )                            | The walnut-tree.   | The fruit.                      | The kernel emollient, the shell astringent.   |   |                   |
| Jujuba, ( <i>Rhamnus zizyph.</i> Lin.)                   | Jujubes.   | The fruit.                      | Emollient and balsamic.   |   |                   |
| Juncus odoratus.   | Sweet-rush, or camel's-hay.                                | The herb.                       | Aromatic.   | An ingredient in theriaca.  |                   |
| Juniperus, ( <i>Junip. commun.</i> Lin.)                 | Juniper.   | The berries, wood, and resin.   | Carminative and stomachic.  | An essential oil, and spirituous water. Ingredient in a great number of officinal compositions.               |                   |
| Kali, ( <i>Salfol.</i> Lin.)                             | Glass-wort.  |                                 |   | An alkaline salt.   |                   |
| Kermes, ( <i>Coccus querc. ilic.</i> Lin.)               | Kermes.  |                                 | Astringent and corroborant.   | A confection.   |                   |
| Lac.   | Milk.  |                                 | Analeptic and corroborant.  | A saccharine salt.  |                   |
| Lactuca, ( <i>Lactuca tiv.</i> Lin.)                     | Lettuce.   | The juice.                      | Supposed narcotic.  |   |                   |
| Lamium album.  | White archangel, or dead-nettle.                           | The leaves and flowers.         | Supposed corroborant.   |   |                   |
| Lavendula, ( <i>Lavend. spic.</i> Lin.)                  | Greater, or broad-leaved lavender.                         | The flowers.                    | An excellent cordial and aromatic.  | An essential oil, a simple and compound spirit, and a conserve. An ingredient in some officinal preparations. |                   |
| Laurus, ( <i>Laur. nobilis.</i> Lin.)                    | The bay tree.  | The leaves and berries.         | Carminative and antispasmodic.  | An expressed oil.   |                   |
| Lazuli lapis.  |  |                                 | A strong emetic.  |   |                   |
| Lentiscus, ( <i>Pistacia lentisc.</i> )                  | The lentisc or mastich tree.                               | The wood.                       | Astringent.   |   |                   |
| Lepidium, ( <i>Lepid. latifol.</i> Lin.)                 | Common broad distander, pepper-wort, or poor man's pepper. | The leaves.                     | Antiscorbutic and diuretic.   |   |                   |
| Leviticum, ( <i>Ligust. levist.</i> Lin.)                | Lovage.  | The root and seed.              | Aromatic.   | Ingredients in some compound waters.  |                   |
| Lichen cinereus terrestris, ( <i>Lichen canin.</i> Lin.) | Ash-coloured ground liverwort.                             | The whole.                      | Recommended by Dr Mead as a specific against the bite of a mad dog, but without foundation. | Principal ingredient in the <i>pulvis antilyssus</i> .  |                   |



| Lift of<br>Simples. | TECHNICAL NAMES.   | ENGLISH NAMES.                     | PARTS USED IN<br>MEDICINE.   | VIRTUES.                                      | PREPARATIONS FROM THEM.   |
|---------------------|--|------------------------------------|--|---|---|
|                     | Lignum campe-<br>chense, ( <i>Hæ-<br/>matox. campech.<br/>Lin.</i> ) | Logwood.                           | The wood.  | Astringent.                                   | An extract.   |
|                     | Lignum rhodium,<br>( <i>Genist. canari-<br/>Lin.</i> )               | Rose-wood.                         | The wood.  | Cordial.                                      | An essential oil.   |
|                     | Lilium album,<br>( <i>Convul. maial.<br/>Lin.</i> )                  | White lily.                        | The root and flow-<br>ers.   | Emollient and an-<br>tipasmodic.              |   |
|                     | Limon, ( <i>Citrus li-<br/>mon. Lin.</i> )                           | The lemon-tree.                    | The fruit.   | Aromatic, antiscor-<br>butic, and cordial.    | An essential oil.   |
|                     | Linaria, ( <i>Antir-<br/>rhin. linar. Lin.</i> )                     | Toad-flax.                         | The leaves.  | Diuretic and ca-<br>thartic, but<br>doubtful. |   |
|                     | Lingua cervina,<br>( <i>Asplen. colo-<br/>pend. Lin.</i> )           | Hart's tongue.                     | The leaves.  | Aperient.                                     |   |
|                     | Linum catharti-<br>cum.  | Purging flax, or<br>mill-mountain. | The leaves.  | Cathartic.                                    |   |
|                     | Linum vulgare,<br>( <i>Lin. usitatiss.<br/>Lin.</i> )                | Flax.                              | The seed.  | Emollient.                                    | An expressed oil.   |
|                     | Liquida ambra.   | Sweet gum, or stor-<br>ax tree.    | The resinous juice.  | Cordial.                                      |   |
|                     | Lithospermum,<br>( <i>Lithosperm. of-<br/>ficin. Lin.</i> )          | Gromwell.                          | The seeds.   | Resolvent.                                    |   |
|                     | Lobelia, <i>Pharmac.<br/>Ross. (Lobel. si-<br/>philit. Lin.)</i>     |                                    | The root.  | Alterant.                                     |   |
|                     | Lumbriceti limaces<br>terrestres.                                    | Earth-worms and<br>snails.         |  | Aperient and ana-<br>leptic.                  | Decoction in milk.  |
|                     | Lupinus, ( <i>Lupin.<br/>alb. Lin.</i> )                             | White lupines.                     | The seeds.   | Anthelmintic.                                 |   |
|                     | Lupulus, ( <i>Humul.<br/>lup. Lin.</i> )                             | Hops.                              | The loose leafy<br>heads which<br>grow upon the<br>tops of the stalks. | Diuretic and stoma-<br>chic.                  |   |
|                     | Lycoperdon, ( <i>Ly-<br/>coperd. bovis.<br/>Lin.</i> )               | Puff-ball, or dusty<br>mushroom.   | The whole.   | Styptic.                                      |   |
|                     | Lycopodium, <i>Pha.<br/>Ross. (Lycopod.<br/>clavat. Lin.)</i>        |                                    |  |   |   |
|                     | Macia. See <i>Nux<br/>Mofchata.</i>                                  |                                    |  |   |   |
|                     | Majorana, ( <i>Origan.<br/>majoran. Lin.</i> )                       | Sweet marjoram.                    | The leaves and flow-<br>ers.   | Aromatic and er-<br>rhine.                    | An essential oil.   |
|                     | Malabathrum.   | Indian leaf.                       |  | Aromatic.                                     | An ingredient in mithridate<br>and theriaca.  |
|                     | Malva, ( <i>Malu. ro-<br/>tundifol. Lin.</i> )                       | The mallow.                        | The leaves and<br>flowers.   | Emollient.                                    | A conserve of the flowers.  |
|                     | Malus.   | The apple-tree.                    | The fruit.   | Refrigerant and<br>laxative.                  |   |
|                     | Mandragora, ( <i>A-<br/>trop. mandrag.<br/>Lin.</i> )                | The mandrake.                      | The leaves.  | Narcotic.                                     |   |
|                     | Manna, ( <i>Fraxin.<br/>orn. Lin.</i> )                              | The manna ash.                     | The concreted<br>juice.  | Cathartic.                                    | Gives name to an officinal lo-<br>hoch, and enters several o-<br>ther compositions. |
|                     | Marrubium, ( <i>Mar-<br/>rub. vulg. Lin.</i> )                       | White horehound.                   | The leaves.  | Stomachic and ape-<br>rient.                  | An ingredient in theriaca.  |

| TECHNICAL NAMES.   | ENGLISH NAMES.                       | PARTS USED IN<br>MEDICINE.          | VIRTUES.   | PREPARATIONS FROM THEM.   |
|--|--------------------------------------|-------------------------------------|--|---|
| Marum Syriacum,<br>( <i>Teucrium mar.</i><br>Lin.)   | Syrian herb ma-<br>flich.            | The leaves.                         | Aromatic and er-<br>rhine.                           | An ingredient in some cepha-<br>lic tincts.   |
| Matricaria, ( <i>Ma-<br/>tricar. parthen.</i><br>Lin.)   | Feverfew.                            | The leaves and<br>flowers.          | Aperient and an-<br>tipasmodic.                      |   |
| Mechoacanana,<br>( <i>Convolv. me-<br/>choan.</i> Lin.)  | White jalap.                         | The root.                           | Cathartic.   |   |
| Mel.   | Honey.                               |                                     | Aperient and deter-<br>gent.                         |   |
| Melilotus, ( <i>Trifol.<br/>melilot.</i> Lin.)   | Melilot.                             | The leaves and<br>flowers.          | Emollient and car-<br>minative.                      | Gives name to a plaster.  |
| Melissa, ( <i>Meliss.<br/>officin.</i> Lin.)   | Balm.                                | The leaves.                         | Aromatic.  | An infusion, and simple wa-<br>ter.   |
| Melo, ( <i>Cucumis<br/>melo.</i> Lin.)   | The melon.                           | The seeds.                          | Refrigerant and<br>emollient.                        |   |
| Mentha crispata,<br>( <i>Pharmac. Ross.</i> )  | Danish or German<br>curled mint.     | The herb.                           | Aromatic and cor-<br>dial.                           | A distilled water, essential oil,<br>and essence. An ingredient<br>in several official prepara-<br>tions.                 |
| Mentha vulgaris,<br>( <i>Menth. virid.</i><br>Lin.)  | Spearmint.                           | The herb.                           | Aromatic and cor-<br>dial.                           | A distilled water, essential oil,<br>and essence. An ingredient<br>in several official prepara-<br>tions.                 |
| Mentha piperitis.  | Pepper-mint.                         | The herb.                           | Aromatic and cor-<br>dial.                           | A distilled water, essential oil,<br>and essence. An ingredient<br>in several official prepara-<br>tions.                 |
| Mercurialis, ( <i>Mer-<br/>cur. annua.</i> Lin.)   | French mercury.                      | The leaves.                         | Emollient and laxa-<br>tive.                         | A syrup.  |
| Meum, ( <i>Ethusa<br/>meum.</i> Lin.)  | Spiguel.                             | The root.                           | Aromatic and car-<br>minative.                       |   |
| Mezerion.  | Mezerion, or<br>spurge olive.        | The root, bark, and<br>berries.     | Violently cathartic.                                 |   |
| Millefolium, ( <i>A-<br/>chill. millefol.</i><br>Lin.)   | Millefoil, or yar-<br>row.           | The leaves and<br>flowers.          | Mildly astringent<br>and aromatic.                   | An essential oil.   |
| Millefolium nobile,<br><i>Pharmac. Ross.</i><br>( <i>Achill. nob.</i><br>Lin.)                         |                                      |                                     |  |   |
| Millepedæ.   | Wood-lice, hog-<br>lice, or slaters. |                                     | Diuretic.  | The insects dried and powder-<br>ed; an infusion in wine; al-<br>so an ingredient in some<br>other official preparations. |
| Minium. See<br>PLUMBUM.  |                                      |                                     |  |   |
| Morus diaboli,<br>( <i>Scabios. fuccif.</i><br>Lin.)   | Devil's bit.                         | The leaves and<br>roots.            | Diaphoretic.   |   |
| Morus nigra.   | The mulberry-tree.                   | The fruit and bark<br>of the roots. | Refrigerant, astrin-<br>gent, and anthel-<br>mintic. | A syrup from the juice of the<br>fruit.   |
| Moschus.   | Musk.                                |                                     | Diaphoretic and<br>antipasmodic.                     | A julep.  |
| Mungos, ( <i>Pharm.<br/>Brunf. et Ross.</i> )  |                                      |                                     |  |   |
| Myrobolani.  | Myrobalans.                          | The fruit.                          | Purgative.   |   |
| Muscus Islandicus,<br>seu Catharticus,<br><i>Pharm. Ross. et<br/>Brunf. (Lichen.<br/>island.</i> Lin.) |                                      |                                     |  |   |

| TECHNICAL NAMES.   | ENGLISH NAMES.                 | PARTS USED IN MEDICINE.                      | VIRTUES.   | PREPARATIONS FROM THEM.   |
|--|--------------------------------|--|--|---|
| Myrrhis, ( <i>Sison Canadense</i> , Lin.)                    | Sweet cicely.                  | The leaves and seeds.                        | Diuretic.  |   |
| Myrtillus, ( <i>Vaccin. myrtil.</i> Lin.)                    | Whortle-berry.                 | The leaves and berries.                      | Astringent.  |   |
| Napus, ( <i>Rapa napus</i> , Lin.)                           | Sweet navew, or navew gentile. | The seeds.                                   | Aromatic.  | An ingredient in the theriaca.  |
| Rapa sylvestris, ( <i>Brassic. nap.</i> Lin.)                | Rape.                          | The seeds.                                   | Aromatic and stimulant.                                      | An expressed oil.   |
| Nardus Celtica, ( <i>Valerian. Celt.</i> Lin.)               | Celtic nard.                   | The roots.                                   | Stomachic and carminative.                                   | Ingredients in the mithridate and theriaca.   |
| Nardus Indica, ( <i>Andropog. nardus</i> , Lin.)             | Indian nard.                   | The roots.                                   | Stomachic and carminative.                                   | Ingredients in the mithridate and theriaca.   |
| Nasturtium aquaticum, ( <i>Sisymb. nastur. aquat.</i> Lin.)  | Water cresses.                 | The leaves and juice.                        | Aperient and antiscorbutic.                                  | An ingredient in the succi scorbutici.  |
| Nasturtium hortense, ( <i>Lepid. sativ.</i> Lin.)            | Garden cresses.                | The leaves and seeds.                        | Aperient and antiscorbutic, but much weaker than the former. |   |
| Nepeta, ( <i>Nepet. catar.</i> Lin.)                         | Nep, or catmint.               | The leaves.                                  | Aromatic and cordial.  |   |
| Nephriticum lignum, ( <i>Guilandin. moring.</i> Lin.)        | Nephritic wood.                | The wood in substance.                       | Diuretic, but uncertain.                                     |   |
| Nicotiana, ( <i>Nicotian. tabac.</i> Lin.)                   | Tobacco.                       | The leaves.                                  | Violently emetic, cathartic, and narcotic.                   | An extract recommended by Stahl and other German physicians.  |
| Nigella, ( <i>Nigel. sativ.</i> Lin.)                        | Fennel-flower.                 | The seeds.                                   | Aperient and diuretic, but uncertain.                        |   |
| Ninfi, ( <i>Pharmac. Brunf. et Ross. (Siam. ninfi.</i> Lin.) |                                |  |  |   |
| Nitrum, ( <i>Nitrum. nativ.</i> Lin.)                        | Nitre or salt-petre.           |  | Diaphoretic, diuretic, and refrigerant.                      | An acid spirit and fixed alkaline salt, an aqueous decoction or solution, troches. An ingredient in many other officinal preparations.                    |
| Nummularia, ( <i>Lysimach. nummular.</i> Lin.)               | Moneywort, or herb twopence.   | The leaves.                                  | Antiscorbutic.   |   |
| Nux mosehata, ( <i>Myristica.</i> Lin.)                      | The nutmeg-tree.               | The fruit, and covering called <i>mace</i> . | An excellent aromatic, cordial, and stomachic.               | An expressed oil, falsely called <i>oil of mace</i> ; an essential oil; a simple water; a spirituous water; an ingredient in many officinal compositions. |
| Nux pistachia, ( <i>Pistac. terebinth.</i> Lin.)             | The pistachia tree.            | The fruit.                                   | Emollient and analeptic.                                     |   |
| Nux vomica, ( <i>Strychnos nuxvom.</i> Lin.)                 | Nux vomica.                    | The fruit.                                   | Used only as a poison for dogs, &c.                          |   |
| Nymphaea alba.   | White water-lily.              | The roots and flowers.                       | Astringent and corroborative.                                |   |
| Ochra, ( <i>Ochra ferri.</i> Lin.)                           | Yellow ochre.                  |  | Astringent, but very weak.                                   |   |
| Olivea, ( <i>Olea Europae.</i> Lin.)                         | The olive-tree.                | The fruit.                                   | Emollient.   | An expressed oil used in almost all ointments, plasters, &c.  |



| TECHNICAL NAMES.  | ENGLISH NAMES.                                    | PARTS USED IN<br>MEDICINE.         | VIRTUES.   | PREPARATIONS FROM THEM.  |
|---|---|------------------------------------|--|--|
| Ononis, ( <i>Onon.<br/>arvens.</i> Lin.)  | Rest-harrow, cam-<br>mock, or petty-<br>whin.     | The root.                          | Aperient and diu-<br>retic.  |  |
| Opium, ( <i>Papaver<br/>Orientale</i> , Lin.)                                   | The Asiatic poppy.                                | The inspissated<br>juice.          | A most excellent<br>anodyne and cor-<br>dial when pro-<br>perly applied,<br>but a very fatal<br>poison if taken in<br>too great quan-<br>tity. | Purified by straining, called<br>the <i>Thebaic extract</i> ; a vi-<br>nous and spirituous tincture,<br>called <i>liquid laudanum</i> . Also<br>a capital ingredient in many<br>official preparations. |
| Origanum, ( <i>Ori-<br/>gan. vulg.</i> Lin.)                                    | Wild marjoram.                                    | The leaves.                        | Aromatic.  | An essential oil.  |
| Oryza, ( <i>Oryza<br/>sativa</i> . Lin.)  | Rice.   | The grain.                         | Emollient and re-<br>frigerant.  |  |
| Ostreæ, ( <i>Ostre.<br/>edul.</i> Lin.)   | Oysters.  | The shells.                        | Absorbent.   | Levigated.   |
| Oxylapathum,<br>( <i>Rumex acetos.</i><br>Lin.)                                 | Sharp-pointed<br>dock.                            | The roots and<br>leaves.           | Alterant and laxa-<br>tive.  |  |
| Oxycoccus, <i>Phar.<br/>Ross.</i> ( <i>Vaccin. oc-<br/>cycoc.</i> Lin.)         |   |                                    |  |  |
| Pæonia, ( <i>Pæon.<br/>officinal.</i> Lin.)                                     | Male and female<br>peony.                         | The roots, flowers,<br>and seeds.  | Emollient and an-<br>tispasmodic.  | Ingredients in some anti-epi-<br>leptic powders.   |
| Palma, ( <i>Cocos nu-<br/>cifera</i> , Lin.)                                    | The palm-tree.                                    | The kernels of the<br>fruit.       | Emollient and ano-<br>dyne.  | An expressed oil used in sto-<br>machic plasters.  |
| Papaver album,<br>( <i>Papaver som-<br/>nifer.</i> Lin.)                        | The white poppy.                                  | The heads.                         | Anodyne.   | A syrup.   |
| Papaver erraticum,<br>( <i>Papaver rhæas</i> ,<br>Lin.)                         | Red poppy, or<br>corn-roie.                       | The flowers.                       | Valued chiefly for<br>the colour they<br>communicate.  | A syrup.   |
| Paralytis, ( <i>Primula<br/>elator.</i> Lin.)                                   | Cowslip.  | The flowers.                       | Corroborant and<br>antispasmodic.  | A syrup.   |
| Pareira brava, ( <i>Cis-<br/>sampelos pareir.</i><br>Lin.)                      | Pareira brava.                                    | The root.                          | Attenuant, diure-<br>tic, and lithon-<br>triptic.  |  |
| Parietaria, ( <i>Pa-<br/>rietar. officinal.</i><br>Lin.)                        | Pellitory of the<br>wall.                         | The leaves.                        | Emollient and<br>diuretic.   | Ingredient in a nephritic de-<br>coction.  |
| Pastinaca, ( <i>Pastina.<br/>sativa</i> . Lin.)                                 | Garden parsnep.                                   | The roots and<br>seeds.            | Emollient and aro-<br>matic.   |  |
| Pastinaca silvestris.   | Wild parsnep.                                     | The seeds.                         | Aromatic.  |  |
| Pentaphyllum,<br>( <i>Potentilla rep-<br/>tans</i> , Lin.)                      | Cinquefoil.                                       | The root.                          | Astringent.  |  |
| Pechurum faba,<br><i>Pharmac. Ross.</i><br>( <i>An species<br/>laur.?</i> Lin.) |   |                                    |  |  |
| Perficaria urens,<br>( <i>Perfic. hydrapi.</i><br>Lin.)                         | Bitter arsmart,<br>lake-weed, or<br>water-pepper. | The leaves.                        | Diuretic and deter-<br>tergent when ex-<br>ternally applied.   |  |
| Perficaria mitis.   | Spotted arsmart.                                  | The leaves.                        | Antifetid and a-<br>stringent.   |  |
| Perfica.  | The peach-tree.                                   | The leaves, flowers,<br>and fruit. | Laxative, anthel-<br>mintic, and re-<br>frigerant.   |  |
| Peruvianus cortex,<br>( <i>Cinchona offic.</i><br>Lin.)                         | The quinquina, or<br>Jesuit's-bark<br>tree.       | The bark.                          | A most excellent<br>corroborative.   | An extract, a resin, a spirituous<br>tincture, a compound tinc-<br>ture, a tincture in volatile<br>spirit; also an ingredient in<br>the stomachic tincture.  |

| I list of<br>Simples. | TECHNICAL NAMES.   | ENGLISH NAMES.                         | PARTS USED IN<br>MEDICINE.                    | VIRTUES.  | PREPARATIONS FROM THEM.  |
|-----------------------|--|--|---|---|--|
|                       | Petasites, ( <i>Tussilag.<br/>petasit.</i> Lin.)                 | Butterbur.                             | The roots.                                    | Aromatic, aperient, and deobstruent.                    |  |
|                       | Petroleum.   | Rock oil.                              |   | Anodyne and corroborative when applied externally.      |  |
|                       | Petroleum Barba-dense.   | Barbadoes tar.                         |   | Diluent, sudorific, and corroborative.                  |  |
|                       | Petrofelinum, ( <i>A-pium petrofelin.</i> Lin.)                  | Common parsley.                        | The roots, leaves, and seeds.                 | Aperient and somewhat aromatic.                         | The seeds an ingredient in an electuary.   |
|                       | Peucedanum, ( <i>Peucedan. officinal.</i> Lin.)                  | Hog's-fennel, or sulphur-wort.         | The root.                                     | Aperient, stimulating, and crinine.                     |  |
|                       | Pimpinella fangui-sorba, ( <i>Sanguisorba officinalis,</i> Lin.) | Burnet.                                | The leaves.                                   | Astringent.   |  |
|                       | Pimpinella saxi-fraga.   | Burnet saxifrage.                      | The root, leaves, and seeds.                  | Diaphoretic, diuretic, and antiscorbutic.               |  |
|                       | Pinus sylvestris.  | The pine tree.                         | The kernels of its fruit or cones, and resin. | The kernels emollient; for the resin, see TEREBINTHINA. |  |
|                       | Piper album.   | White pepper.                          |   | Highly aromatic and stimulant.                          | A simple distilled water, and an essential oil.  |
|                       | Piper longum.  | Long pepper.                           |   |   |  |
|                       | Piper nigrum.  | Black pepper.                          |   |   |  |
|                       | Piper Jamaicense.  | Jamaica pepper, pimento, or all-spice. |   |   |  |
|                       | Piper Indicum, ( <i>Capficum annuum,</i> Lin.)                   | Guinea pepper.                         |   |   |  |
|                       | Pix liquida.   | Tar.                                   |   | Attenuant and stimulating.                              | An infusion in water, and an ingredient in a kind of pectoral pills.   |
|                       | Pix arida.   | Dry, or stone pitch.                   |   | A warm adhesive resinous substance.                     | Ingredients in several plasters, ointments, and cecrates.  |
|                       | Pix Burgundica.  | Burgundy pitch.                        |   |   |  |
|                       | Plantago latifolia, ( <i>Plantago major,</i> Lin.)               | Common broad-leaved plantane.          | The leaves.                                   | Astringent.   |  |
|                       | Plumbum, ( <i>Plumbum nativum,</i> Lin.)                         | Lead.                                  |   | Astringent and refrigerating, but very dangerous.       | Several chemical preparations. See CHEMISTRY, n° 401—405. A tincture and extract, or solution in vegetable acids; also an ingredient in several ointments, &c. |
|                       | Polium montanum, ( <i>Polium teucurium,</i> Lin.)                | Poley-mountain.                        | The tops.                                     | Aromatic.   | Ingredient in the Mithridate and theriaca.   |
|                       | Polygala amara, <i>Pharm. Ross.</i> ( <i>Polyg. amar.</i> Lin.)  |  | The root.                                     |   |  |

| TECHNICAL NAMES.   | ENGLISH NAMES.                                   | PARTS USED IN<br>MEDICINE. | VIRTUES.                               | PREPARATIONS FROM THEM.  |
|--|--|----------------------------|--|--|
| Polypodium, ( <i>Po-<br/>lypod. vulgar. Lin.</i> )                                 | Polypody.  | The root.                  | Laxative.                              |  |
| Populus nigra.   | Black poplar.                                    | The buds.                  | Aromatic.                              | Used only in an ointment, but<br>capable of being applied to<br>better purposes. ( <i>Lewis.</i> )                               |
| Porrum, ( <i>Allium<br/>porrum, Lin.</i> )   | The leek.  | The root.                  | A stimulating diu-<br>retic.           |  |
| Portulaca, ( <i>Portu-<br/>lac. olerac. Lin.</i> )                                 | Purslane.  | The seeds.                 | Refrigerant.                           |  |
| Primula veris.   | Primrose.  | The herb and root.         | Aromatic and sto-<br>machic.           | An infusion and distilled spirit.  |
| Prunella, ( <i>Prunell.<br/>vulg. Lin.</i> )                                       | Self-heal.                                       | The leaves.                | Attenuant and de-<br>tergent.          |  |
| Pruna brignolensis.  | Brignole plums, or<br>prunelloes.                |                            |  |  |
| Pruna Gallica.   | French, or com-<br>mon prunes.                   | }                          | Gently laxative.                       |  |
| Pruna Damascena.   | Damascen plums,<br>or damsons.                   |                            |  |  |
| Pruna Silvestria.<br>See <i>Acacia.</i>  |  |                            |  |  |
| Pfyllium, ( <i>Plan-<br/>tago pfyll. Lin.</i> )                                    | Fleawort.  | The seeds.                 | Emollient and laxa-<br>tive.           |  |
| Ptarmica, ( <i>Achil.<br/>ptarmic. Lin.</i> )                                      | Sneczewort, or ba-<br>stard pellitory.           | The root.                  | Errhine and stimu-<br>lating.          |  |
| Pulegium, ( <i>Mentb.<br/>puleg. Lin.</i> )  | Pennyroyal.                                      | The leaves.                | A warm aromatic.                       | A simple water, a spirituous<br>water, an essential oil; and<br>an ingredient in some other<br>official compositions.            |
| Pulmonaria macu-<br>losa, ( <i>Pulmon.<br/>official. Lin.</i> )                    | Spotted lung-wort,<br>or sage of Jeru-<br>salem. | The leaves.                | Said to be aperient<br>and analeptic.  |  |
| Pulsatilla nigricans,<br><i>Pharmac. Ross.<br/>(Anemone pra-<br/>tensis. Lin.)</i> |  | The herb.                  |  | An extract and distilled water.  |
| Pyrethrum, ( <i>An-<br/>themis pyrethr.<br/>Lin.</i> )                             | Pellitory of Spain.                              | The root.                  | Promotes the salival<br>flux.          |  |
| Quassia, ( <i>Quassia a-<br/>mar. Lin.</i> )                                       |  | The root.                  | An excellent stoma-<br>chic and tonic. | An extract.  |
| Quercus, ( <i>Quercus<br/>robur, Lin.</i> )  | Oak tree.  | The bark.                  | Strongly astringent.                   |  |
| Quercus marina,<br><i>Pharm. Ross.<br/>(Fucus vesiculo-<br/>sus, Lin.)</i>         |  |                            |  |  |
| Raphanus rustica-<br>nus, ( <i>Raphanus<br/>sativus Lin.</i> )                     | Horse-radish.                                    | The root.                  | Stimulating and at-<br>tenuant.        | A compound water.  |
| Rapa.  | The turnip.                                      | The roots and<br>seeds.    | Aperient, and<br>slightly aromatic.    |  |
| Rhabarbarum,<br>( <i>Rheum palmat.<br/>Lin.</i> )                                  | Rhubarb.   | The root.                  | Cathartic and sto-<br>machic.          | Toasted; a watery infusion;<br>vinous and spirituous tinc-<br>tures; and an ingredient<br>in several official compo-<br>sitions. |
| Rhaponticum,<br>( <i>Rheum rha-<br/>pon. Lin.</i> )                                | Rhapontic.                                       | The roots.                 | Laxative.                              |  |
| Ribes nigrum.  | The black-currant<br>bush.                       | The fruit.                 | Refrigerant and de-<br>tergent.        | } A gelly.   |
| Ribes rubrum.  | The red-currant<br>bush.                         | The fruit.                 | Ditto.                                 |  |

Rhododendron.



List of  
Simples.

| TECHNICAL NAMES.   | ENGLISH NAMES.  | PARTS USED IN<br>MEDICINE.                      | VIRTUES.   | PREPARATIONS FROM THEM.   |
|--|---|---|--|---|
| Rhododendron,<br><i>Pharm. Ross.</i><br>( <i>Rhodod. chrysanthum</i> , Lin.)     |   | The herb.                                       |  |   |
| Rosa damascena.  | Damask rose.  | The flower.                                     | Aromatic and gently laxative.                                      | A distilled water and syrup.  |
| Rosa rubra.  | The red rose.   | The flower.                                     | Astringent and corroborative.                                      | A conserve, honey, tincture, troches, vinegar, and syrup. An ingredient in several official compositions.   |
| Rosmarinus horten-<br>sis, ( <i>Rosm. officinal.</i><br>Lin.)                    | Rosemary.   | The tops and<br>flowers.                        | A fine aromatic and<br>cordial.                                    | An essential oil; a distilled spirit called <i>Hungary water</i> . An ingredient in many cordial and antispasmodic medicines.                         |
| Rubia tinctorum.   | Madder.   | The root.                                       | Aperient and detergent.  |   |
| Rubus arcticus,<br><i>Pharm. Ross.</i>   |   |   |  |   |
| Rubus idæus.   | The rasp-berry<br>bush.                                   | The fruit.                                      | Refrigerant.   | A syrup.  |
| Rubus niger, ( <i>Ru-<br/>bus fruticosus</i> , Lin.)                             | The bramble.  | The leaves.                                     | Astringent.  |   |
| Ruscus, ( <i>Rusc. acu-<br/>leat.</i> Lin.)                                      | Butcher's-broom,<br>or knee-holly.                        | The root.                                       | Aperient.  |   |
| Ruta, ( <i>Rut. gra-<br/>veol.</i> Lin.)   | Broad-leaved rue.   | The leaves and<br>seeds.                        | Powerfully stimu-<br>lating, attenua-<br>ting, and deter-<br>gent. | An extract, an essential oil, distilled water, and conserve.  |
| Sabadilla, <i>Pharm.</i><br><i>Ross.</i> ( <i>An species<br/>veratr.</i> ? Lin.) |   | The seeds.                                      |  |   |
| Sabina, ( <i>Junip.</i><br><i>sabin.</i> Lin.)                                   | Savin.  | The leaves or tops.                             | A stimulating aperient.  | An essential oil; distilled water; watery extract; and an ingredient in several official compositions.  |
| Saccharum album.   | White sugar.  | }   | Emollient & laxative   |   |
| Saccharum candu-<br>m.   | Sugar-candy.  |   |  |   |
| Sagapenum.   | Gum sagapenum.  |   | Aperient and deobstruent.  | An ingredient in several antispasmodic medicines.   |
| Sal alkali vegeta-<br>bile.  | Vegetable alkaline<br>salt, or pearl-<br>ashes.           |   | Aperient, diuretic,<br>and caustic.                                | The basis of a great number of neutral salts.   |
| Sal alkali minerale.   | Mineral alkali, salt<br>of Soda, or basis<br>of sea-salt. |   | Ditto.   | Ditto.  |
| Sal catharticus a-<br>marus.   | Epsom salt.   |   | Cathartic.   | Magnesia.   |
| Sal commune.   | Common salt.  |   | In small doses sti-<br>mulant, in large<br>ones cathartic.         |   |
| Salicaria, <i>Pharm.</i><br><i>Ross.</i> ( <i>Lythrum<br/>Salicar.</i> Lin.)     | Purple loose-strife.                                      | The herb.                                       | Astringent.  |   |
| Salix, ( <i>Salix fra-<br/>gilis</i> , Lin.)                                     | The crack-willow.   | The bark.                                       | Corroborant.   |   |
| Salvia, ( <i>Salvia<br/>officinal.</i> Lin.)                                     | Common sage.  | The leaves.                                     | Moderately stimu-<br>lating and astringent.                        | Infusions.  |
| Salvia sylvestris.   | Wood sage.  | The leaves.                                     | Ditto.   |   |
| Sambucus, ( <i>Sam-<br/>buc. niger</i> , Lin.)                                   | Common black-<br>berried alder.                           | The leaves, bark,<br>flowers, and ber-<br>ries. | Cathartic, aroma-<br>tic, and aperient.                            | A rob for internal use from the berries, and an ointment and oil from the flowers and bark; the flowers are also ingredients in some compound waters. |

| TECHNICAL NAMES.                                    | ENGLISH NAMES.            | PARTS USED IN MEDICINE. | VIRTUES.   | PREPARATIONS FROM THEM.   |
|---|---------------------------|-------------------------|--|---|
| Sanguis draconis.                                   | Dragon's-blood.           |                         | Astringent.  | An ingredient in some official compositions.  |
| Sanicula, ( <i>Sanicul. Europæa</i> , Lin.)         | Sanicle.                  | The leaves.             | Supposed to be corroborant.  | The first gives name to a plaster, liniment, balsam, and pills; the second is an ingredient in the milder caustic; and the third in an anodyne plaster. |
| Santalum citrinum, ( <i>Santal. alb.</i> Lin.)      | Yellow sanders.           | The wood.               | Greatly recommended by Hoffman as a restorative.                                     |   |
| Santalum rubrum.                                    | Red sanders.              | The wood.               | Used only for its colour.  |   |
| Santonium.  | Worm-feed.                |                         | Anthelmintic.  |   |
| Sapo durus.   | Hard Spanish soap.        | }                       | Resolvent and stimulating.   | }   |
| Sopa mollis.  | Common soft soap.         |                         |  |   |
| Sapo niger.   | Black soap.               |                         |  |   |
| Saponaria, ( <i>Saponar. officinal.</i> Lin.)       | Soapwort or bruise-wort.  | The herb and root.      | Aperient, corroborant, and sudorific.  |   |
| Sarcocolla.   | Gum sarcocoll.            |                         | Supposed a vulnerary.  |   |
| Sarfariparilla, ( <i>Smitax. sarfap.</i> Lin.)      | Sarfariparilla.           | The root.               | Alterant, and diaphoretic.   | Infusions and extract.  |
| Sassafras, ( <i>Laurus sassafras</i> , Lin.)        | Sassafras.                | The root.               | Alterant, aperient, and corroborant.   | An essential oil; an ingredient in some officinal preparations.   |
| Satureia, ( <i>Satureia hortens.</i> Lin.)          | Summer savoury.           | The leaves.             | A very pungent warm aromatic.  | Salep supposed to be a preparation from a root of this kind ( <i>Lewis</i> ).   |
| Satyrion mas, ( <i>Orchis bifol.</i> Lin.)          | Orchis.                   | The root.               | Coagulant and corroborative.   |   |
| Saxifraga alba, ( <i>Saxifrag. granulata.</i> Lin.) | White-flowered saxifrage. | The roots and leaves.   | } Supposed to be aperient, diuretic, and lithontriptic, but without just foundation. |   |
| Saxifraga vulgaris.                                 | Meadow saxifrage.         | The leaves and seeds.   |  |   |
| Scabiosa, ( <i>Scabios. arvens.</i> Lin.)           | Scabious.                 | The leaves.             | Aperient, sudorific, and expectorant.  | Gives name to a powder, and is an ingredient in some official preparations.   |
| Scammonium.   | Scammony.                 |                         | Strongly cathartic.  |   |
| Scilla, ( <i>Scill. maritima.</i> Lin.)             | The squill, or sea-onion. | The root.               | Powerfully diuretic, stimulant, and expectorant.                                     |   |
| Scordium, ( <i>Teucri. scordium</i> , Lin.)         | Water germander.          | The leaves.             | Deobstruent, diuretic, and sudorific, but doubtful.                                  | An ingredient in mithridate, theriaca, and several other preparations.  |
| Scorzonera, ( <i>Scorzon. humilis</i> , Lin.)       | Viper's grass.            | The root.               | Cordial and stimulant, but doubtful.   |   |
| Scrophularia, ( <i>Scrophular. nodosa.</i> Lin.)    | Fig-wort.                 | The leaves and root.    | Supposed corroborant, but doubtful.  |   |
| Sebesten, ( <i>Cordia myxa.</i> Lin.)               | Sebesten plum.            |                         | Emollient.   | Spiritous tinctures, compound powders, and a syrup.   |
| Sedum majus, ( <i>Sedum album</i> , Lin.)           | Greater houseleek.        | The leaves.             | Refrigerant.   |   |
| Sena, ( <i>Cassia sena</i> , Lin.)                  | Sena.                     | The leaves.             | Cathartic.   |   |

| TECHNICAL NAMES.  | ENGLISH NAMES.                        | PARTS USED IN<br>MEDICINE. | VIRTUES.  | PREPARATIONS FROM THEM.  |
|---|---------------------------------------|----------------------------|---|--|
| Seneca, ( <i>Polygal.<br/>jenek. Lin.</i> )                       | Seneca.                               | The root.                  | Cathartic, diaphoretic, diuretic, and sometimes emetic.   | A spirituous tincture; a compound decoction; and an ingredient in a number of tinctures.           |
| Serpentaria Virginiana, ( <i>Aristolochia serpentaria. Lin.</i> ) | Virginian snake-weed.                 | The root.                  | A warm diaphoretic and diuretic.  |  |
| Serpyllum, ( <i>Thymus serpil. Lin.</i> )                         | Mother of thyme.                      | The herb.                  | Aromatic.   |  |
| Seselis vulgaris, ( <i>Tordyl. officin. Lin.</i> )                | Common hartwort.                      | The seeds.                 | } Agreeable aromatics, but neglected. <i>Lewis.</i>   |  |
| Seselis maffiliensis.   | Italian hartwort.                     | The seeds.                 |   |  |
| Sigillum Salomonis, ( <i>Convallaria Polygon. Lin.</i> )          | Solomon's seal.                       | The root.                  | Probably emollient.   |  |
| Simarouba.  | Simarouba bark.                       |                            | Astringent.   |  |
| Sinapi, ( <i>Sinapis nigra. Lin.</i> )                            | Mustard.                              | The seeds.                 | Strongly pungent and stimulant.   | An expressed oil.  |
| Solanum, ( <i>Solan. migr. Lin.</i> )                             | Nightshade.                           | The leaves.                | Powerfully evacuant.  |  |
| Spermaceti.   | Spermaceti.                           |                            | A mild emollient.   | Gives name to a lochoch.   |
| Spina cervina, ( <i>Rham. cathart. Lin.</i> )                     | Buckthorn.                            | The berries.               | Strongly cathartic.   | A syrup.   |
| Spiritus vinosi.  | Vinous Spirits.                       |                            |   |  |
| Spongia, ( <i>Spongia officinal. Lin.</i> )                       | Sponge.                               |                            | Cordial and stimulant.  | Used as menstruums for tinctures, &c. in almost every preparation of that kind.                    |
| Stannum, ( <i>Stann. chrysellin. Lin.</i> )                       | Tin.                                  |                            | Used as a tent for dilating ulcers, &c.   | Burnt.   |
| Staphilagria, ( <i>Delphin. staphilagr. Lin.</i> )                | Staveacre.                            | The seeds.                 | Anthelmintic.   | Powdered.  |
| Stoechas, ( <i>Lavendul. stoechas. Lin.</i> )                     | Arabian stoechas, or French lavender. | The flowers.               | A violent cathartic taken internally. Its external application destroys lice and other insects. |  |
| Stramonium, ( <i>Datura. stramon. Lin.</i> )                      | Thorn-apple.                          | The herb.                  | Aromatic.   | An ingredient in mithridate and theriaca.  |
| Suber, ( <i>Querc. sub. Lin.</i> )                                | The cork-tree.                        | The bark.                  | Narcotic.   | An extract.  |
| Succinum, ( <i>Succin. electric. Lin.</i> )                       | Amber.                                |                            | Astringent.   |  |
| Sulphur.  | Sulphur, or brimstone.                |                            | Astringent and corroborant.   | A tincture, balsam, essential oil, and an ingredient in several officinal preparations.            |
| Sumach, ( <i>Rhus coriaria. Lin.</i> )                            | Common sumach.                        | The leaves and seeds.      | Laxative, diaphoretic, and alterant.  | Solutions in different kinds of oils, called <i>balsams</i> , and an ingredient in some ointments. |
| Tacamahac.  | Gum tacamahac.                        |                            | Astringent.   |  |
|   |                                       |                            | Discutient, emollient, and suppurative.   | An ingredient in several plaster.  |



List of  
Simples.List of  
Simples.

| TECHNICAL NAMES.  | ENGLISH NAMES.                  | PARTS USED IN<br>MEDICINE.      | VIRTUES.                                      | PREPARATIONS FROM THEM.   |
|---|---------------------------------|---------------------------------|---|---|
| Tamarindus, ( <i>Tamarind. Indica</i> , Lin.)               | Tamarinds.                      | The fruit.                      | Refrigerant and laxative.                     | Ingredients in some laxative electuaries.   |
| Tamariscus, ( <i>Tamarix Gallica</i> , Lin.)                | The tamarisk-tree.              | The leaves and bark.            | Astringent.                                   |   |
| Tanacetum, ( <i>Tanacet. vulgare</i> , Lin.)                | Tanfy.                          | The leaves, flowers, and seeds. | Stimulating, antispasmodic, and anthelmintic. |   |
| Thapsus barbatus, ( <i>Verbasc. thapsus</i> , Lin.)         | Great white mullein.            | The leaves and flowers.         | Analeptic.                                    | A spirituous extract from the flowers.  |
| Tartarum.   | Tartar.                         |                                 | Refrigerant and cathartic.                    | Purified from its earthy parts, and called <i>cream of tartar</i> , the basis of some useful purging salts. An alkali is also prepared from it by fire. |
| Terebinthina Chia.  | Chian, or Cyprus turpentine.    |                                 | } Warm stimulating diuretics and aperients.   |   |
| Terebinthina Veneta.  | Venice turpentine.              |                                 |   |   |
| Terebinthina Argentoratensis.                               | Straßburgh turpentine.          |                                 |   |   |
| Terebinthina communis.                                      | Common turpentine.              |                                 | Used chiefly in external applications.        | An essential oil. (The residuum forms the <i>resina alba et nigra</i> , or white and black rosin of the shops, used in almost every ointment.)          |
| Thea bohea et viridis.                                      | Bohea and green tea.            | The leaves.                     | Cordial, diuretic, and diaphoretic.           | An infusion.  |
| Thlaspi, ( <i>Thlaspi. varicif.</i> Lin.)                   | Treacle, or mithridate mustard. | The seeds.                      | Aromatic and stimulant.                       | Ingredient in theriaca.   |
| Thymus citratus.  | Lemon thyme.                    | The leaves.                     | An agreeable aromatic.                        | A distilled water and essential oil.  |
| Thymus vulgaris.  | Common thyme.                   | The leaves.                     | An agreeable aromatic.                        | A distilled water and essential oil.  |
| Tilia, ( <i>Tilia Europæa</i> , Lin.)                       | The lime, or linden tree.       | The flowers.                    | Antispasmodic.                                |   |
| Tithymalus.   | The spurge.                     | The juice of the root.          | Most violent and inflammatory cathartics.     |   |
| Tormentilla, ( <i>Tormentill. erect.</i> Lin.)              | Tormentil, or septfoil.         | The root.                       | Astringent.                                   | An ingredient in several official compositions.   |
| Trifolium paludosum, ( <i>Menyanthes trifoliata</i> , Lin.) | Marsh trefoil, or buck bean.    | The leaves.                     | Laxative and alterant.                        |   |
| Triticum.   | Wheat.                          | The grain and flour.            | Nutritive and glutinous.                      | Starch.   |
| Turpethum, ( <i>Convolv. turpeth.</i> Lin.)                 | Turbith.                        | The root.                       | Violently cathartic.                          | An extract.   |
| Tussilago, ( <i>Tussilag. farfar.</i> Lin.)                 | Coltsfoot.                      | The leaves and flowers.         | Emollient and mucilaginous.                   | An ingredient in pectoral decoctions.   |
| Valeriana sylvestris, ( <i>Valer. officin.</i> Lin.)        | Wild valerian.                  | The root.                       | Antispasmodic.                                | A tincture in proof spirit, and in volatile spirit; also an ingredient in several cephalic and anti-epileptic medicines.                                |
| Veronica mas, ( <i>Veron. officin.</i> Lin.)                | Male speedwell.                 | The leaves.                     | Aperient.                                     | Infusions.  |

Vinum

| TECHNICAL NAMES.                                    | ENGLISH NAMES.           | PARTS USED IN MEDICINE.              | VIRTUES.                                      | PREPARATIONS FROM THEM.  |
|---|--------------------------|--------------------------------------|---|--|
| Vinum.  | Wine.                    |                                      | Cordial and corroborant.                      | A menstruum for a great number of medicinal substances.  |
| Viola, ( <i>Viola odorat.</i> Lin.)                 | The single March violet. | The flowers.                         | Laxative.                                     | A syrup.   |
| Vipera, ( <i>Coluber viper.</i> Lin.)               | The viper.               | The flesh and fat.                   | Restorative and emollient.                    | A vinous tincture; an ingredient in theriaca.  |
| Vitis vinifera.                                     | The vine.                | The leaves, sap, flowers, and fruit. | Astringent, diuretic, aromatic, and pectoral. | Wine. The dried fruit or raisins are ingredients in some pectoral and stomachic medicines.   |
| Winteranus cortex, ( <i>Winteran. aromat.</i> Lin.) | Winter's bark.           |                                      | Aromatic.                                     |  |
| Urtica.   | The nettle.              | The herb.                            | Refrigerant and diuretic.                     |  |
| Uva ursi, ( <i>Arbutus uv. ursi.</i> Lin.)          |                          | The leaves.                          | Astringent and lithontriptic.                 |  |
| Zedoaria, ( <i>Kempferia rotund.</i> Lin.)          | Zedoary.                 | The root.                            | Stomachic and corroborant.                    | An extract with proof-spirit. Also an ingredient in some cordial medicines.  |
| Zincum.   | Zinc.                    |                                      | Supposed to be a good antiepileptic.          | The metal reduced to a calx by fire. Calamine and tutty are a kind of ores of this metal. These last are the basis of two official ointments. A salt produced by its combination with the vitriolic acid. See CHEMISTRY, n° 157. |
| Zinziber, ( <i>Amom. zinzib.</i> Lin.)              | Ginger.                  | The root.                            | Aromatic.                                     | A syrup. Also an ingredient in many official compositions.   |

N. B. To most of the articles taken from the *Pharmacopœia Rossica* (lately published at Petersburg,) no virtues are annexed in the above list, because none are mentioned in the original.

## M A T

## M A T

Mathema-  
tics.

**MATHEMATICS**, the science of quantity; or a science that considers magnitudes either as computable, or measurable.

The word in its original, *μαθηματις*, signifies *discipline*, or *science* in the general; and seems to have been applied to the doctrine of quantity, either by way of eminence, or because, this having the start of all other sciences, the rest took their common name therefrom. See SCIENCE.

For the origin of the mathematics, Josephus dates it before the flood, and makes the sons of Seth observers of the course and order of the heavenly bodies: he adds, that to perpetuate their discoveries, and secure them from the injuries either of a deluge or a conflagration, they had them engraven on two pillars, the one of stone, the other of brick; the former of which he says was standing in Syria in his days. See ASTRONOMY.

The first who cultivated mathematics after the flood, were the Assyrians and Chaldeans; from whom, the same Josephus adds, they were carried by Abraham to the Egyptians; who proved such notable proficient, that Aristotle makes no scruple to fix the first rise of mathematics among them. From Egypt, 584 years

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I

before Christ, they passed into Greece through the hands of Thales; who having learned geometry of the Egyptian priests, taught it in his own country. After Thales, comes Pythagoras; who, among other mathematical arts, paid a particular regard to arithmetical; fetching the greatest part of his philosophy from numbers: he was the first, as Laërtius tells us, who abstracted geometry from matter; and to him we owe the doctrine of incommensurable magnitude, and the five regular bodies, besides the first principles of music and astronomy. Pythagoras was succeeded by Anaxagoras, Oenopides, Briso, Antipho, and Hippocrates of Scio; who all applied themselves particularly to the quadrature of the circle, the duplicature of the cube, &c. but the last with most success: this last is also mentioned by Proclus, as the first who compiled elements of mathematics.

Democritus excelled in mathematics as well as physics; though none of his works in either kind are extant, the destruction of which some authors lay at Aristotle's door. The next in order is Plato, who not only improved geometry, but introduced it into physics, and so laid the foundation of a solid philosophy. Out of his school proceeded a crowd of mathematicians

Mathema-  
tics.

25 N

cians

Proclus mentions 13 of note; among whom was Leodamus, who improved the analysis first invented by Plato; Theætetus, who wrote elements; and Archytas, who has the credit of being the first who applied Mathematics to use in life. These were succeeded by Neocles and Theon, the last of whom contributed to the elements. Eudoxus excelled in arithmetic and geometry, and was the first founder of a system of astronomy. Menechmus invented the conic-sections, and Theudius and Hermodotus improved the elements.

For Aristotle, his works are so stored with mathematics, that Blancanus compiled a whole book of them: out of his school came Eudemus and Theophrastus; the first of whom wrote of numbers, geometry, and invisible lines; the latter, a mathematical history. To Aristotle, Isidorus, and Hypicles, we owe the books of solids; which, with the other books of elements, were improved, collected, and methodised by Euclid, who died 284 years before Christ.

An hundred years after Euclid, came Eratosthenes and Archimedes. Contemporary with the latter was Conon, a geometrician and astronomer. Soon after came Apollonius Pergæus; whose conics are still extant. To him are likewise ascribed the 14th and 15th books of Euclid, which are said to have been contracted by Hypicles. Hipparchus and Menelaus wrote on the subtenses in a circle, the latter also on spherical triangles: Theodosius's three books of sphericks are still extant. And all these, Menelaus excepted, lived before Christ.

A. D. 70. Ptolemy of Alexandria was born; the prince of astronomers, and no mean geometrician: he was succeeded by the philosopher Plutarch, of whom we have till extant some mathematical problems. After him came Eutocius, who commented on Archimedes, and occasionally mentions the inventions of Philo, Diocles, Nicomedes, Sporus, and Heron, on the duplicature of the cube. To Ctesibius of Alexandria, we owe our pumps; and Geminus, who came soon after, is preferred by Proclus to Euclid himself.

Diophantus of Alexandria was a great master of numbers, and the first inventor of algebra: among others of the ancients, Nicomachus is celebrated for his arithmetical, geometrical, and musical works; Serenus, for his books on the section of the cylinder; Proclus, for his comments on Euclid; and Theon has the credit, among some, of being author of the books of elements ascribed to Euclid. The last to be named among the ancients, is Pappus of Alexandria, who flourished A. D. 400, and is celebrated for his books of mathematical collections still extant.

Mathematics are commonly distinguished into *pure and speculative*, which consider quantity abstractedly; and *mixed*, which treat of magnitude as subsisting in material bodies, and consequently are interwoven every where with physical considerations.

Mixed mathematics are very comprehensive; since to them may be referred astronomy, optics, geography, hydrostatics, mechanics, fortification, navigation, &c. See the articles *ASTRONOMY*, *OPTICS*, &c.

Pure mathematics have one peculiar advantage, that they occasion no disputes among wrangling disputants, as in other branches of knowledge; and the reason is, because the definitions of the terms are premised, and

every body that reads a proposition has the same idea of every part of it. Hence it is easy to put an end to all mathematical controversies, by showing, either that our adversary has not stuck to his definitions, or has not laid down true premises, or else that he has drawn false conclusions from true principles; and in case we are able to do neither of these, we must acknowledge the truth of what he has proved.

It is true, that in mixed mathematics, where we reason mathematically upon physical subjects, we cannot give such just definitions as the geometricians: we must therefore rest content with descriptions; and they will be of the same use as definitions, provided we are consistent with ourselves, and always mean the same thing by those terms we have once explained.

Dr Barrow gives a most elegant description of the excellence and usefulness of mathematical knowledge, in his inaugural oration, upon being appointed professor of mathematics at Cambridge.

The mathematics, he observes, effectually exercise, not vainly delude, nor vexatiously torment, studious minds with obscure subtilties; but plainly demonstrate every thing within their reach, draw certain conclusions, instruct by profitable rules, and unfold pleasant questions. These disciplines likewise enure and corroborate the mind to a constant diligence in study; they wholly deliver us from a credulous simplicity, most strongly fortify us against the vanity of scepticism, effectually restrain us from a rash presumption, most easily incline us to a due assent, and perfectly subject us to the government of right reason. While the mind is abstracted and elevated from sensible matter, distinctly views pure forms, conceives the beauty of ideas, and investigates the harmony of proportions; the manners themselves are sensibly corrected and improved, the affections composed and rectified, the fancy calmed and settled, and the understanding raised and excited to more divine contemplations.

**MATHEMATICAL**, any thing belonging to the science of mathematics.

**MATHEMATICAL Instruments**, such instruments as are usually employed by mathematicians, as compasses, scales, quadrants, &c.

*Machine for dividing MATHEMATICAL Instruments.* See RAMSDEN'S *Machine*.

**MATHER** (Dr Cotton), an eminent American divine, born at Bolton in New England in the year 1663. He was educated in Harvard college, and in 1684 became minister of Bolton; in the diligent discharge of which office he spent his life, and promoted several excellent societies for the public good: particularly one for suppressing disorders, one for reforming manners, and a society of peace-makers, whose professed business it was to compose differences and prevent lawsuits. His reputation was not confined to his own country: for in 1710, the university of Glasgow sent him a diploma for the degree of doctor in divinity; and, in 1714, the Royal Society of London chose him one of their fellows. He died in 1728; and is said to have published in his life-time 382 pieces, including single sermons, essays, &c. yet several were of a larger size, among which was *Magnalia Christi Americana*, or an Ecclesiastical History of New-England, from its first planting in 1620, to 1698, folio. But the most remarkable of all his works was that in which



Matrafs  
Matron.

which, like Glanville, he defended the doctrine of witchcraft. We shall content ourselves with giving the title at large, which is as follows: "The wonders of the invisible world; being an account of the trials of several witches lately executed in New England, and of several remarkable curiosities therein occurring. Together with, 1. Observations on the nature, the number, and the operations of the devils. 2. A short narrative of a late outrage committed by a knot of witches in Swedeland; very much resembling, and so far explaining, that under which New-England has laboured. 3. Some counsels directing a due improvement of the terrible things lately done by the unusual and amazing range of evil spirits in New-England. 4. A brief discourse upon the temptations which are the more ordinary devices of Satan. By Cotton Mather; published by the special command of his excellency the governor of the province of Massachusetts's Bay in New England." Printed first at Boston in New-England, and reprinted at London in 1736, 4to.

MATRASS, CUCURBIT, or BOLT-HEAD, among chemists. See CHEMISTRY, n° 80.

MATRICARIA, FEVERFEW; a genus of the polygama superflua order, belonging to the syngenesia class of plants. There are five species, but the only remarkable one is the parthenium or common feverfew. This hath very fibrous clustering roots, crowned with numerous compound leaves; upright stalks branching on every side two or three feet high; garnished with compound plain leaves of seven oval folioles, cut into many parts; and all the branches terminated by many compound radiated white flowers having a yellow disk. There are varieties with double flowers, with semidouble flowers, with double fistular flowers, with a fistular disk and plain radius, with short-rayed flowers, with rayless flowers, with rayless sulphur-coloured heads, and with finely curled leaves.—All these varieties flower abundantly in June, each flower being composed of numerous hermaphrodite and female florets; the former compose the disk, the latter the radius or border, and which, in the double and fistular kinds, are very ornamental in gardens, but of a disagreeable odour; and are all succeeded by plenty of seed in autumn, by which they are easily propagated, as well as by parting the roots and cuttings.

*Medical uses.* This plant has received a most extraordinary character in hysseric and other affections of the nerves, as well as for being a carminative, or warm stimulating bitter. Dr Lewis, however, thinks it inferior to camomile; with which he says it agrees in all its sensible qualities, only being somewhat weaker.

MATRICULA, a register kept of the admission of officers and persons entered into any body or society, whereof a list is made.

MATRIMONY. See MARRIAGE.

MATRIX, or UTERUS. See ANAT. n° 372.

MATRON, an elderly married woman.

*Jury of MATRONS.* When a widow feigns herself with child in order to exclude the next heir, and a supposititious birth is suspected to be intended, then, upon the writ de ventre inspiciendo, a jury of women is to be impanelled to try the question whether the woman is with child or not. So, if a woman is convicted of a capital offence, and, being condemned

to suffer death, pleads in stay of execution, that she is pregnant, a jury of matrons is impanelled to inquire into the truth of the allegation; and, if they find it true, the convict is respited till after her delivery.

MATRONALIA, a festival of the ancient Roman matrons, from whom it had its name. It was celebrated on the kalends of March in honour of the god Mars; and was to the Roman ladies what the Saturnalia was to their husbands, for at this time they served their women-slaves at tables and received presents from their husbands.

MATROSSES, are soldiers in the train of artillery, who are next to the gunners, and assist them in loading, firing, and spunging the great guns. They carry firelocks, and march along with the store wagons, both as a guard, and to give their assistance in case a wagon should break down.

MATT, in a ship, is a name given to rope-yarn, junk, &c. beat flat and interwoven; used in order to preserve the yards from galling or rubbing in hoisting or lowering them.

MATTER, whatever is extended, and capable of making resistance: hence, because all bodies, whether solid or fluid, are extended, and do resist, we conclude that they are material, or made up of matter. See MECHANICS, chap. i.

MATTHEW, or Gospel of St MATTHEW, a canonical book of the New Testament.

St MATTHEW wrote his gospel in Judæa, at the request of those he had converted; and it is thought he began in the year 41, eight years after Christ's resurrection. It was written, according to the testimony of all the ancients, in the Hebrew or Syriac language; but the greek version, which now passes for the original, is as old as the apostolical time.

St MATTHEW the Evangelist's Day, a festival of the Christian church, observed on September 21st.

St MATTHEW, the son of Alphaeus, was also called *Levi*. He was of Jewish original, as both his names discover, and probably a Galilean. Before his call to the apostolate, he was a publican or toll-gatherer to the Romans: an office of bad repute among the Jews, on account of the covetousness and exaction of those who managed it; St Matthew's office particularly conflicting in gathering the customs of all merchandise that came by the sea of Galilee, and the tribute that passengers were to pay who went by water. And here it was that Matthew sat at the receipt of custom, when our Saviour called him to be a disciple. It is probable, that, living at Capernaum, the place of Christ's usual residence, he might have some knowledge of him before he was called. Matthew immediately expressed his satisfaction in being called to this high dignity, by entertaining our Saviour and his disciples at a great dinner at his own house, whither he invited all his friends, especially those of his own profession, hoping, probably, that they might be influenced by the company and conversation of Christ. St Matthew continued with the rest of the apostles till after our Lord's ascension. For the first eight years afterwards, he preached in Judæa. Then he betook himself to propagating the gospel among the Gentiles, and chose Ethiopia as the scene of his apostolical ministry; where it is said he suffered martyrdom,

Matronalia  
Matthew.

Matthew  
||  
Maturants.

dom, but by what kind of death is altogether uncertain. It is pretended, but without any foundation, that Hyrtacus, king of Ethiopia, desiring to marry Iphigenia, the daughter of his brother and predecessor Æglippus, and the apostle having repented to him that he could not lawfully do it, the enraged prince ordered his head immediately to be cut off. Baronius tells us, the body of St Matthew was transported from Ethiopia to Bithynia, and from thence was carried to Salernum in the kingdom of Naples in the year 954, where it was found in 1080, and where duke Robert built a church bearing his name.

ST MATTHEW, a town of Spain in the kingdom of Arragon, seated in a pleasant plain, and in a very fertile country watered with many springs. W. Long. O. 15. N. Lat. 40. 22.

MATTHEW OF PARIS. See PARIS.

MATTHEW OF Westminster, a Benedictine monk and accomplished scholar, who wrote a history from the beginning of the world to the end of the reign of Edward I. under the title of *Flores Hysteriorum*; which was afterwards continued by other hands. He died in 1380.

ST MATTHIAS, an apostle, was chosen instead of Judas. He preached in Judæa and part of Æthiopia, and suffered martyrdom. See the *Acts of the Apostles*, chap. i. There was a Gospel published under Matthias's name, but rejected as spurious; as likewise some traditions, which met with the same fate.

ST MATTHIAS'S DAY; a festival of the Christian church, observed on the 24th of February. St Matthias was an apostle of Jesus Christ, but not of the number of the twelve chosen by Christ himself. He obtained this high honour upon a vacancy made in the college of the apostles by the treason and death of Judas Iscariot. The choice fell on Matthias by lot; his competitor being Joseph called *Barfabas*, and surnamed *Justus*. Matthias was qualified for the apostleship, by having been a constant attendant upon our Saviour all the time of his ministry. He was, probably, one of the seventy disciples. After our Lord's resurrection, he preached the gospel first in Judæa. Afterwards it is probable he travelled eastwards, his residence being principally near the irruption of the river Aparus and the haven Hyflus. The barbarous people treated him with great rudeness and inhumanity; and, after many labours and sufferings in converting great numbers to Christianity, he obtained the crown of martyrdom; but by what kind of death, is uncertain.—They pretend to shew the relics of St Matthias at Rome; and the famous abbey of St Matthias near Treves boasts of the same advantage; but doubtless both without any foundation. There was a gospel ascribed to St Matthias; but it was universally rejected as spurious.

MATTINS, the first canonical hour, or the first part of the daily service, in the Romish church.

MATTHIOLUS (Peter Andrew), an eminent physician in the 16th century, born at Sienna, was well skilled in the Greek and Latin tongues. He wrote learned commentaries on Dioscorides, and other works which are esteemed; and died in 1577.

MATURANTS, in pharmacy, medicines which promote the suppuration of tumours.

MAUCAUCO, MACACO, or *Maki*, in zoology. Maucuco See LEMUR, n° 3.

MAVIS, in ornithology, a species of turdus. See MAUPERTUIS, TURDUS.

MAUBEUGE, a town of the Netherlands in Hainault, with an illustrious abbey of canons, whose must be noble both by the father and mother's side. This place was ceded to France in 1678; and fortified after the manner of Vauban. It is seated on the river Sambre, in E. Long. 5. O. N. Lat. 50. 15.

MAUNCH, in heraldry, the figure of an ancient coat sleeve, borne in many gentlemen's escutcheons.

MAUNDY THURSDAY, is the Thursday in Passion week; which was called *Maudy* or *Mandate Thursday*, from the command which our Saviour gave his apostles to commemorate him in the Lord's supper, which he this day instituted; or from the new commandment which he gave them to love one another, after he had washed their feet as a token of his love to them.

MAUPERTUIS (Peter Louis Morceau de), a celebrated French academian, was born at St Malo in 1698; and was there privately educated till he arrived at his 16th year, when he was placed under the celebrated professor of philosophy M. le Blond, in the college of la Marche, at Paris. He soon discovered a passion for mathematical studies, and particularly for geometry. He likewise practised instrumental music in his early years with great success; but fixed on no profession till he was 20, when he entered into the army. He first served in the Grey Muffeteers; but in the year 1720, his father purchased him a company of cavalry in the regiment of La Rocheguyon.

He remained but five years in the army, during which time he pursued his mathematical studies with great vigour; and it was soon remarked by M. Freret, and other academicians, that nothing but geometry could satisfy his active soul and unbounded thirst for knowledge. In the year 1723, he was received into the Royal Academy of Sciences, and read his first performance, which was a memoir upon the construction and form of musical instruments, November 15. 1724.

During the first years of his admission he did not wholly confine his attention to mathematics; he dived into natural philosophy, and discovered great knowledge and dexterity in observations and experiments upon animals.

If the custom of travelling into remote climates, like the sages of antiquity, in order to be initiated into the learned mysteries of those times, had still subsisted, no one would have conformed to it with greater eagerness than M. de Maupertuis. His first gratification of this passion was to visit the country which had given birth to Newton; and during his residence at London he became as zealous an admirer and follower of that philosopher as of any one of his own countrymen.

His next excursion was to Basil in Switzerland, where he formed a friendship with the famous John Bernouilli and his family, which continued to his death.

At his return to Paris, he applied himself to his favourite studies with greater zeal than ever;—and how well he fulfilled the duties of an academian, may

Mauvettis. may be gathered by running over the memoirs of the academy from the year 1724 to 1736; where it appears that he was neither idle, nor occupied by objects of small importance. The most sublime questions in geometry and the relative sciences received from his hands that elegance, clearness, and precision, so remarkable in all his writings.

In the year 1736, he was sent by the king of France to the polar circle, to measure a degree in order to ascertain the figure of the earth, accompanied by Messrs Clairaut, Camus, Le Monnier, l'Abbé Outhier, and Celsius the celebrated professor of astronomy at Upsal. This distinction rendered him so famous, that, at his return, he was admitted a member of almost every academy in Europe.

In the year 1740, he had an invitation from the king of Prussia to go to Berlin; which was too flattering to be refused. His rank among men of letters had not wholly effaced his love for his first profession, namely, that of arms. He followed his Prussian majesty into the field, and was a witness of the dispositions and operations that preceded the battle of Moltwitz; but was deprived of the glory of being present, when victory declared in favour of his royal patron, by a singular kind of adventure. His horse, during the heat of the action, running away with him, he fell into the hands of the enemy, and was at first but roughly treated by the Austrian soldiers, to whom he could not make himself known for want of language; but being carried prisoner to Vienna, he received such honours from their imperial majesties as were never effaced from his memory.

From Vienna, he returned to Berlin; but as the reform of the academy which the king of Prussia then meditated was not yet mature, he went again to Paris, where his affairs called him, and was chosen, in 1742, director of the academy of sciences.

In 1743, he was received into the French academy. This was the first instance of the same person being a member of both the academies at Paris at the same time.

M. de Mauvettis again assumed the soldier at the siege of Fribourg, and was pitched upon by marshal Cigny and the count d'Argenfon to carry the news to the French king of the surrender of that citadel.

He returned to Berlin in the year 1744, when a marriage was negotiated and brought about by the good offices of the queen mother, between our author and mademoiselle de Borck, a lady of great beauty and merit, and nearly related to M. de Borck, at that time minister of state. This determined M. de Mauvettis to settle at Berlin, as he was extremely attached to his new spouse, and regarded this alliance as the most fortunate circumstance of his life.

In the year 1746, he was declared by his Prussian majesty president of the royal academy of sciences at Berlin, and soon after by the same prince was honoured with the order of Merit.

However, all these accumulated honours and advantages, so far from lessening his ardour for the sciences, seemed to furnish new allurements to labour and application. Not a day passed but he produced some new project or essay for the advancement of knowledge. Nor did he confine himself to mathematical studies only: metaphysics, chemistry, botany, polite

literature, all shared his attention, and contributed to Mauvettis's fame.

But his constitution, though naturally robust, soon felt the effects of this intemperance in his philosophical pursuits. Indeed his health had been considerably impaired before, by the great fatigues of various kinds in which his active mind had involved him. Though from the amazing hardships he had undergone in his northern expedition, most of his future bodily sufferings may be traced. The intense sharpness of the air could only be supported by means of strong liquors; which helped but to lacerate his lungs, and bring on a spitting of blood, which began at least 12 years before he died.

Yet still, after his bodily strength was thus impaired, his mind seemed to enjoy the greatest vigour; for the best of his writings were produced, and most sublime ideas developed, during the time of his confinement by sickness, when he was unable to occupy his presidential chair at the academy.

M. de Mauvettis took several journeys to St Malo, during the last years of his life, for the recovery of his health. And though he always received benefit by breathing his native air, yet still, upon his return to Berlin, his disorder likewise returned with greater violence.—His last journey into France was undertaken in the year 1757; when he was obliged, soon after his arrival there, to quit his favourite retreat at St Malo, on account of the danger and confusion which that town was thrown into by the arrival of the English in its neighbourhood.

From thence he went to Bourdeaux, hoping there to meet with a neutral ship to carry him to Hamburg, in his way back to Berlin; but, being disappointed in that hope, he went to Toulouse, where he remained seven months. He had then thoughts of going to Italy, in hopes a milder climate would restore him to health;—but finding himself grow worse, he rather inclined towards Germany, and went to Neuchâtel, where for three months he enjoyed the conversation of lord Marshal, with whom he had formerly been much connected. At length he arrived at Basil, October 16. 1758, where he was received by his friend Bernoulli and his family, with the utmost tenderness and affection. He at first found himself much better here than he had been at Neuchâtel: but this amendment was of short duration; for as the winter approached, his disorder returned, accompanied by new and more alarming symptoms. He languished here many months, during which he was attended by M. de la Condamine; and died in 1759.

He wrote in French, 1. The figure of the earth determined. 2. The measure of a degree of the meridian. 3. A discourse on the parallax of the moon. 4. A discourse on the figure of the stars. 5. The elements of geography. 6. Nautical astronomy. 7. Elements of astronomy. 8. A physical dissertation on a white inhabitant of Africa. 9. An essay on cosmography. 10. Reflexions on the origin of languages. 11. An essay on moral philosophy. 12. A letter on the progress of the sciences. 13. An essay on the formation of bodies. 14. An eulogium on M. de Montesquieu. 15. Letters, and other works.

MAURUA, one of the Society-Islands in the South Sea. It is a small island, entirely surrounded with.



Mauritius.

with a ridge of rocks, and without any harbour for shipping. It is inhabited; and its productions are the same with those of the neighbouring islands. A high round hill rises in the middle of it, which may be seen at the distance of ten or twelve leagues.

MAURITIUS, or MAURICE, an island of Africa, about 500 miles east of Madagascar. It lies in the latitude of 20 and 21 degrees south; the climate warm, but very wholfome; the soil stony. It is encumbered with high rocks and lofty mountains along the coasts; but within-land it is tolerably flat and fertile, exceedingly well watered, abounding with fish, fowl, and cattle, plentifully stored with ebony and other valuable woods, and, in point of extent, large enough to invite and support a considerable colony. In the beginning of the 16th century it was discovered by the Portuguese, who, knowing that Pliny and other ancient writers had mentioned the island of Cerne in these seas, took it for granted that this must be it; and accordingly we find it stiled *Cerne*, or *Sirne*, in their maps: but, notwithstanding this, they did not think fit to settle it; and indeed their force was so small, in comparison of the vast dominions they grasped, that it was very excusable. However, according to their laudable custom, they put some hogs, goats, and other cattle upon it, that in case any of their ships either going to the Indies, or returning to Portugal, should be obliged to touch there, they might meet with refreshments. The Dutch, in the second voyage they made to the East-Indies under their admiral James Cornelius Vanneck, came together with five ships on the 15th of September 1568; anchored in a commodious port, to which they gave the name of *Warwick Haven*; and gave a very good account of the place in their journals. Captain Samuel Castleton, in the *Pearl*, an English East-India ship, arrived there on the 27th of March 1612; and taking it to be an island undiscovered before, bestowed upon it the name of *England's Fore-Isle*, though others of his crew called it *Pearl-Island*, and in the account of their voyage, written by John Tatton the master of the ship, celebrated it as a place very convenient for shipping, either outward or homeward bound, to refresh at. This they sometimes accordingly did, and brought some cargoes of ebony and rich wood from thence, but without fixing any settlement.

At length, in 1638, the Dutch seated themselves here; and it is highly remarkable, that at the very time they were employed in making their first settlement, the French sent a vessel to take possession of it, who found the Dutch before-hand with them, and refused the assistance of an English Indiaman, wooding and watering in another port of the island, who very frankly offered it, to drive the Dutch from their half-settled posts. They continued for some time in quiet possession of the places they fortified in this island, to which they gave the name of *Mauritius*. But having engaged the French, who were settled on Madagascar, to steal 50 of the natives, and sell them for slaves, for the improvement of the Dutch settlements here, this proved the ruin of both colonies: for the negroes surprised and massacred the French in Madagascar; and the slaves in Mauritius fled into the centre of the island; from whence they so much and so incessantly molested those who had been formerly their masters,

that they chose to quit a country where they could no longer remain in any tolerable degree of safety. The East-India company, however, from motives of convenience, and a very imperfect notion of its value, disapproved this measure, and therefore ordered it to be resettled; which was accordingly done, and three forts erected at the principal havens. Things now went on somewhat better than they did before; but they were still very much disturbed by the revolted negroes in the heart of the isle, whom they could never subdue. One principal use that the company made of this place, was to send thither state-prisoners, who, as they were not men of the best morals, quickly corrupted the rest of the inhabitants, and rendered them such a race of outrageous smugglers, the situation of the place concurring with their bad dispositions, that, after various ineffectual attempts made to reform them, orders were at length given to abandon Mauritius a second time, which, after some delays, were put in execution in the year 1710.

In this deserted situation, it was occupied as a derelict, we cannot precisely say when, by the old French East-India company, who bestowed upon it the name of the *Isle of France*; by which, amongst their other possessions, it was granted to the present perpetual company of the Indies, who caused it to be settled, and, as if it had been a place of great signficancy, procured an edict for establishing a provincial council there, dependent upon that in the isle of Bourbon; both which councils, however, were in all respects below the very meanest corporation in this country, yet that of the isle of France was by much the meaner of the two. In truth, it had cost so much, and was considered in every light worth so little, that it had been more than once under deliberation, whether, after the example of the Dutch, they should not leave it again to its old negro inhabitants; which sooner or later in all likelihood would have been its fate, if, in 1735, the famous Mr de la Bourdonnaye had not been sent thither, with the title of *governor-general of the French islands*.

He found this isle in the worst state possible, thinly inhabited by a set of lazy people, who equally hated industry and peace, and who were continually flattering this man to his face, and belying him wherever and as far as they durst. He gave himself no trouble about this, having once found the means to make himself obeyed; he saw the vast importance of the island; he conceived that it might be settled to great advantage; and, without so much as expecting the thanks of those for whom he laboured, he began to execute this great design. His first step was to bring over black boys from Madagascar, whom he carefully trained up in good principles, and in continual exercise; by which he rendered them so good soldiers, that he very quickly obliged the Marones, or wild negroes, either to submit, or to quit the island: he taught the planters to cultivate their lands to advantage; he, by an aqueduct, brought fresh water to the sea-side; and whereas they had not so much as a boat at his coming thither, he made a very fine dock, where he not only built sloops and larger vessels, but even a ship of the burden of 500 ton. However incredible it may seem, yet it is certainly fact, that in the space of five years he rendered this country a paradise, that had been a

mere

Mauritius.

Mauritania, mere wilderness for 5000; and this in spite of the inhabitants, and of the company, who being originally prejudiced by them, behaved ill to him at his return. He soon made the cardinal de Fleury, however, sensible of the true state of things; and compelled the company to acknowledge, though they did not reward, his services. He afterwards returned into the Indies, and perfected the work he had begun; and to him it is owing that the Isle of France is at present one of the finest, as it was always one of the most important and improvable spots upon the globe.

MAURITANIA, an ancient kingdom of Africa, bounded on the west by the Atlantic Ocean, on the south by Getulia or Libya Interior, and on the north by the Mediterranean, and comprehending the greater part of the kingdoms of Fez and Morocco.—Its ancient limits are not exactly mentioned by any historian; neither can they now be ascertained by any modern observations, these kingdoms being but little known to Europeans.

This country was originally inhabited by a people called *Mauri*, concerning the etymology of which name authors are not agreed. It is probable, however, that this country, or at least a great part of it, was first called *Phut*, since it appears from Pliny, Ptolemy, and St Jerome, that a river and territory not far from Mount Atlas went by that name. From the Jerusalem Targum it likewise appears, that part of the *Mauri* may be deemed the offspring of Lud the son of Misraim, since his descendants, mentioned Genesis x. are there called מורי, *Mauri* or *Mauritani*. It is certain, that this region, as well as the others to the eastward of it, had many colonies planted in it by the Phœnicians. Procopius tells us, that in his time two pillars of white stone were to be seen there, with the following inscription in the Phœnician language and character, upon them: “We are the *Canaanites*, that fled from *Joshua* the son of Nun, that notorious robber.” *Ibnu Rachic*, or *Ibnu Raqûq*, an African writer cited by Leo, together with Evagrius and Nicephorus Callistus, assert the same thing.

The Mauritians, according to Ptolemy, were divided into several cantons or tribes. The *Metagonitæ* were seated near the straits of Hercules, now those of Gibraltar. The *Saccosii*, or *Coccosii*, occupied the coast of the Iberian sea. Under these two petty nations the *Masices*, *Verues*, and *Verbice* or *Veruice*, were settled. The *Salisæ*, or *Salinsæ*, were situated lower, towards the ocean; and, still more to the south, the *Velubiliati*. The *Maurenssii* and *Herpiditani* possessed the eastern part of this country, which was terminated by the *Malucha*. The *Angaucani*, or *Jangacaucani*, *Nediberes*, *Zaggenfsi*, *Baniuba*, and *Vacuntæ*, extended themselves from the southern foot of Ptolemy's Atlas Minor to his Atlas Major. Pliny mentions the *Baniuræ*, whom Father Hardouin takes to be Ptolemy's *Baniubæ*; and Mela the *Atlantes*, whom he represents as possessed of the western parts of this district.

The earliest prince of Mauritania mentioned in history is Neptune; and next to him were Atlas and Antæus his two sons, both famous in the Grecian fables on account of their wars with Hercules. Antæus, in his contention with that hero, seems to have behaved with great bravery and resolution. Having received large reinforcements of Libyan troops, he

cut off great numbers of Hercules's men. But that celebrated commander, having at last intercepted a strong body of Libyans sent to the relief of Antæus, gave him a total overthrow, wherein both he and the best part of his forces were put to the sword. This decisive action put Hercules in possession of Libya and Mauritania, and consequently of the riches of all these kingdoms. Hence came the fable, that Hercules, finding Antæus, a giant of an enormous size with whom he was engaged in single combat, to receive fresh strength as often as he touched his mother earth when thrown upon her, at last lifted him up in the air and squeezed him to death. Hence likewise may be deduced the fable intimating that Hercules took the globe from Atlas upon his own shoulders, overcame the dragon that guarded the orchards of the Hesperides, and made himself master of all the golden fruit there. Bochart thinks that the fable alluded chiefly to naval engagements, wherein Hercules, for the most part, was victorious; though Antæus from time to time received succours by sea. But at last Hercules, coming up with one of his squadrons which had a strong reinforcement on board, made himself master of it, and thus rendered Antæus incapable for the future of making head against him. The same author likewise insinuates, that the notion of Antæus's gigantic stature prevailing for so many centuries amongst the Tingitaniens, pointed out the size of the vessels of which his fleets and squadrons were composed. As for the golden apples so frequently mentioned by the old mythologists, they were the treasures that fell into Hercules's hands upon the defeat of Antæus; the Greeks giving the oriental word *ῥοζα*, *riches*, the signification affixed to their own term *apple*.

With regard to the age in which Atlas and Antæus lived, the most probable supposition seems to be that of Sir Isaac Newton. According to that illustrious author, Ammon the father of Sefac was the first king of Libya, or that vast tract extending from the borders of Egypt to the Atlantic ocean; the conquest of which country was effected by Sefac in his father's life-time. Neptune afterwards excited the Libyans to a rebellion against Sefac, and slew him; and then invaded Egypt under the command of Atlas or Antæus, the son of Neptune, Sefac's brother and admiral. Not long after, Hercules, the general of Thebais and Ethiopia for the gods or great men of Egypt, reduced a second time the whole continent of Libya, having overthrown and slain Antæus near a town in Thebais, from that event called *Antæa* or *Antæopolis*: this, we say, is the notion advanced by Sir Isaac Newton, who endeavours to prove, that the first reduction of Libya, by Sefac, happened a little above a thousand years before the birth of Christ, as the last, by Hercules, did some few years after. Now, though we do not pretend to adopt every particular circumstance of Sir Isaac Newton's system, yet we cannot forbear observing, that it appears undeniably plain from scripture, that neither the western extremity of Libya, nor even the other parts of that region, could possibly have been so well peopled before the time of David or Solomon, as to have sent a numerous army to invade Egypt. For Egypt and Phœnicia, from whence the greatest part of the ancestors of the Libyans

**Mauritania.** byans came, and which were much nearer the place from whence the first dispersion of mankind was made, could not themselves have been greatly overstocked with inhabitants any considerable time before the reign of Saul. And that such an invasion happened in the reign of Neptune, or at least of his son Antæus, has been most fully evinced by this most excellent chronologer.

From the defeat of Antæus, nothing remarkable occurs in the history of Mauritania till the times of the Romans, who at last brought the whole kingdom under their jurisdiction, for which see the article **ROME**. With regard to the customs, &c. of this people, it would seem, from what Hyginus insinuates, that they fought only with clubs, till one Belus, the son of Neptune, as that author calls him, taught them the use of the sword. Sir Isaac Newton makes this Belus to have been the same person with Sesostris king of Egypt, who over-ran a great part of the then known world. 2. All persons of distinction in Mauritania went richly attired, wearing much gold and silver in their clothes. They took great pains in cleansing their teeth, and curled their hair in a curious and elegant manner. They combed their beards, which were very long, and always had their nails pared extremely close. When they walked out in any numbers, they never touched one another, for fear of disconcerting the curls into which their hair had been formed. 3. The Mauritanian infantry, in time of action, used shields made of elephants skins, being clad in those of lions, leopards, and bears, which they kept on both night and day. 4. The cavalry of this nation was armed with broad short lances, and carried targets or bucklers, made likewise of the skins of wild beasts. They used no saddles. Their horses were small and swift, had wooden collars about their necks, and were so much under the command of their riders, that they would follow them like dogs. The habit of these horsemen was not much different from that of the foot above-mentioned, they constantly wearing a large tunic of the skins of wild beasts. The Phutæi, of whom the Mauritians were a branch, were eminent for their shields, and the excellent use they made of them, as we learn from Homer, Xenophon, Herodotus, and scripture. Nay, Herodotus seems to intimate, that the shield and helmet came from them to the Greeks. 5. Notwithstanding the fertility of their soil, the poorer sort of the Mauritians never took care to manure the ground, being strangers to the art of husbandry; but roved about the country in a wild savage manner, like the ancient Scythians or Arabes Scenitz. They had tents, or *mapalia*, so extremely small, that they could scarce breathe in them. Their food was corn, herbage, &c. which they frequently did eat green, without any manner of preparation; being destitute of wine, oil, and all the elegancies as well as many necessaries of life. Their habit was the same both in summer and winter, consisting chiefly of a coarse tattered, though thick, garment, and over it an odd rough tunic; which answered probably to that of their neighbours the Numidians. Most of them lay every night upon the bare ground; though some of them strewed their garments thereon, not unlike the present African Kabyles and Arabs, who, according to Dr Shaw, use their hykes for a bed and covering in

the night. 6. If the most approved reading of **Horace** may be admitted, the Mauritians shot poisoned arrows; which clearly intimates, that they had some skill in the art of preparing poisons, and were excellent dartmen. This last observation is countenanced by Herodian and **Ælian**, who entirely come into it, affirming them to have been in such continual danger of being devoured by wild beasts, that they durst not stir out of their tents or *mapalia* without their darts. Such perpetual exercise must render them exceedingly skillful in hurling that weapon. 7. The Mauritians sacrificed human victims to their deities, as the Phœnicians, Carthaginians, &c. did.

The country people were extremely rude and barbarous; but those inhabiting cities must undoubtedly have had at least some smattering in the literature of the several nations they deduced their origin from. That the Mauritians had some knowledge in naval affairs, seems probable, not only from the intercourse they had with the Phœnicians and Carthaginians, as well as the situation of their country; but likewise from Orpheus, or Onomacritus, who asserts them to have made a settlement at the entrance into Colchis, to which place they came by sea. Magic, sorcery, divination, &c. they appear to have applied themselves to in very early times. Cicero and Pliny say, that Atlas was the inventor of astrology and the doctrine of the sphere, i. e. he first introduced them into Mauritania. This, according to Diodorus Siculus, gave rise to the fable of Atlas's bearing the heavens upon his shoulders. The same author relates, that Atlas instructed Hercules in the doctrine of the sphere and astrology, or rather astronomy, who afterwards brought those sciences into Greece.

**MAUSOLEUM**, a magnificent tomb or funeral monument. The word is derived from Mausolus king of Caria, to whom Artemisia his widow erected a most stately monument, esteemed one of the wonders of the world, and called it, from his own name, *Mausoleum*.

**ST MAWES**, a town of Cornwall in England, seated on the east side of Falmouth haven, in W. Long. 5. 26. N. Lat. 50. 30. It sends two members to parliament.

**MAXILLA**, the **JAW**. See **ANATOMY**, n° 19. —25

**MAXIM**, an established proposition or principle; in which sense it denotes much the same with axiom.

**MAXIMILIAN I.** emperor of Germany, signalized himself against the French while he was king of the Romans, and after he was emperor entered into the army of Henry VIII. of England as a volunteer against that nation: he was a protector of learned men, and abolished an iniquitous tribunal, styled *Judicium oculum Westphalia*: he composed some poems, and the memoirs of his own life. He died in 1519, aged 60.

**MAXIMUM**, in mathematics, denotes the greatest quantity attainable in any given case.

If a quantity conceived to be generated by motion increases or decreases till it arrives at a certain magnitude or position, and then, on the contrary, grows greater or lesser, and it be required to determine the said magnitude or position, the question is called a *problem de maximis et minimis*.

**MAXI-**



May.

MAXIMUS of TYRE, a Platonic philosopher, went to Rome in 146, and acquired high reputation there, that the emperor Marcus Aurelius became his scholar, and gave him frequent proofs of his esteem. This philosopher is thought to have lived till the reign of the emperor Commodus. There are still extant 41 of his dissertations; a good edition of which was printed by Daniel Heinsius, in 1624, in Greek and Latin, with notes.

MAXIMUS (St.), an abbot and confessor of the 7th century, was of a noble family of Constantinople, and distinguished himself by his zeal against the Monothelites, for which he was thrown into prison, and died there on the 13th of August 1662. He wrote a Commentary on the books attributed to Dionysius the Areopagite, and several other works, of which an edition has been published by father Combes.

MAY, the fifth month of the year, consisting of 31 days.

MAY (Isle of), a small island at the mouth of the Frith of Forth in Scotland, about a mile and an half in circumference, and seven miles from the coast of Fife, almost opposite to the rock called the *Bass*. It formerly belonged to the priory of Pittenweem; and was dedicated to St Adrian, supposed to have been martyred in this place by the Danes; and hither, in times of Popish superstition, barren women used to come and worship at his shrine, in hopes of being cured of their sterility. Here is a tower and light-house built by Mr Cunningham of Barns, to whom king Charles I. granted the island in fee, with power to exact two pence per ton from every ship that passes, for the maintenance of a light-house. In the middle of it there is a fresh-water spring, and a small lake. The soil produces pasturage for 100 sheep and 20 black cattle. On the west side the steep rocks render it inaccessible; but to the east there are four landing-places and good riding. It was here that the French squadron, having the chevalier de St George on board, anchored in the year 1708, when the vigilance of Sir George Byng obliged him to relinquish his design, and bear away for Dunkirk. The shores all round the island abound with fish, and the cliffs with water-fowl.

MAY (Thomas), an eminent English poet and historian in the 17th century, was born of an ancient but decayed family in Suffex, educated at Cambridge, and afterwards removed to London, where he contracted a friendship with several eminent persons, and particularly with Endymion Porter, Esq; one of the gentlemen of the bed-chamber to king Charles I. While he resided at court he wrote the five plays now extant under his name. In 1622, he published a translation of Virgil's *Georgics*, with annotations; and in 1635 a poem on king Edward III. and a translation of Lucan's *Pharsalia*, which poem he continued down to the death of Julius Cæsar, both in Latin and English verse. Upon the breaking out of the civil wars he adhered to the parliament; and in 1647, he published, "The history of the parliament of England, which began November the third MDCXL. With a short and necessary view of some precedent years." In 1649, he published, *Historia parlamenti Anglie Breviarium*, in three parts; which he afterwards translated into English. He wrote the Hi-

story of Henry II. in English verse. He died in 1652. He went well to rest over-night, after a cheerful bottle as usual, and died in his sleep before morning; upon which his death was imputed to his tying his night-cap too close under his fat cheeks and chin, which caused his suffocation; but the facetious Andrew Marvel has written a poem of 100 lines, to make him a martyr of Bacchus, and die by the force of good wine. He was interred near Camden in Westminster-Abbey; which caused Dr Fuller to say, that "if he were a biased and partial writer, yet he lieth buried near a good and true historian indeed." Soon after the restoration, his body, with those of several others, was dug up, and buried in a pit in St Margaret's church-yard; and his monument, which was erected by the appointment of Parliament, was taken down and thrown aside.

MAYERNE (Sir Theodore de), baron of Aulbone, was the son of Lewis de Mayerne the celebrated author of *The general history of Spain*, and of the *Monarchie aristo democratique*, dedicated to the states-general. He was born in 1573, and had for his god-father Theodore Beza. He studied physic at Montpelier, and was made physician in ordinary to Henry IV. who promised to do great things for him provided he would change his religion. James I. of England invited him over, and made him first physician to himself and his queen, in which office he served the whole royal family to the time of his death in 1655. His works were printed at London in 1700, and make a large folio, divided into two books; the first containing his *Consilia, Epistolæ, & Observationes*; the second his *Pharmacopœia varisque medicamentorum formulæ*.

MAYHEM. See MAIM.

MAYNE (Jasper), an eminent English poet and divine in the 17th century, who was bred at Oxford, and entered into holy orders. While his majesty resided at Oxford, he was one of the divines appointed to preach before him. He published in 1647 a piece intitled, *OXAOMAXIA, or The people's war examined according to the principles of reason and scripture*, by Jasper Mayne. In 1648, he was deprived of his studentship at Christ-church, and two livings he had; but was restored with the king, who made him his chaplain, and archdeacon of Chichester: all which he held till he died. Dr Maine was held in very high esteem both for his natural parts and his acquired accomplishments. He was an orthodox preacher, and a man of severe virtue and exemplary behaviour; yet of a ready and facetious wit, and a very singular turn of humour. From some stories that are related of him, he seems to have borne some degree of resemblance in his manner to the celebrated Dr Swift; but, if he did not possess those very brilliant parts that distinguished the Dean, he probably was less subject to that capricious and those unaccountable whimsies which at times so greatly eclipsed the abilities of the latter. Yet there is one anecdote related of him, which, although it reflects no great honour on his memory, as it seems to carry some degree of cruelty with it, yet is it a strong mark of his resemblance to the Dean, and a proof that his propensity for drollery and joke did not quit him even in his latest moments. The story is this: The doctor

Mayerne

Mayne.

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had an old servant, who had lived with him some years, to whom he had bequeathed an old trunk, in which he told him he would find *something that would make him drink after his death*. The servant, full of expectation that his master, under this familiar expression, had left him somewhat that would be a reward for the assiduity of his past services, as soon as decency would permit flew to the trunk; when behold, to his great disappointment, the boasted legacy proved to be a red herring. The doctor, however, bequeathed many legacies by will to pious uses; particularly fifty pounds towards the rebuilding of St Paul's cathedral, and 200 pounds to be distributed to the poor of the parishes of Cannington and Pyrton near Watlington, of both which places he had been vicar. In his younger years he had an attachment to poetry; and wrote two plays, the latter of which may be seen in the tenth volume of Dodsley's collection, viz. 1. Amorous war, a tragic-comedy. 2. The city-match, a comedy. He published a poem upon the naval victory by the duke of York over the Dutch, printed in 1665. He also translated into English from the Greek part of Lucian's Dialogues.

MAYNWARING (Arthur), an eminent political writer in the beginning of the 18th century; staid several years at Oxford, and then went to Cheshire, where he lived some time with his uncle Mr Francis Cholmondeley, a very honest gentleman, but extremely averse to the government of king William III. to whom he refused the oaths. Here he prosecuted his studies in polite literature with great vigour; and coming up to London, applied to the study of the law. He was hitherto very zealous in anti-revolutional principles, and wrote several pieces in favour of king James II.; but upon being introduced to the duke of Somerset and the earls of Dorset and Burlington, began to entertain very different notions in politics. His father left him an estate of near 800 l. a year; but so incumbered, that the interest-money amounted to almost as much as the revenue. Upon the conclusion of the peace he went to Paris, where he became acquainted with Mr Boileau. After his return he was made one of the commissioners of the customs, in which post he distinguished himself by his skill and industry. He was a member of the kit-cat-club, and was looked upon as one of the chief supporters of it by his pleasantries and wit. In the beginning of queen Anne's reign, the lord-treasurer Godolphin engaged Mr Done to quit the office of auditor of the imposts, and made Maynwing a present of a patent for that office worth about 2000 l. a year in a time of business. He had a considerable share in the *Medley*, and was author of several other pieces. The *Examiner*, his antagonist in politics, allowed that he wrote with tolerable spirit and in a masterly stile. Sir Richard Steele dedicated the first volume of the *Tatler* to him.

MAYO, one of the Cape de Verd islands, lying in the Atlantic Ocean, near 300 miles from Cape Verd in Africa, about 17 miles in circumference. The soil in general is very barren, and water scarce; however, they have some corn, yams, potatoes, and plantains, with plenty of beeves, goats, and asses. What trees there are, grow on the sides of the hills, and they have some figs and water-melons. The sea round about the island abounds with fish. The chief com-

modity is salt, with which many English ships are loaded in the summer-time. The principal town is Pinofa, inhabited by negroes, who speak the Portuguese language, and are stout, lusty, and fleshy. They are not above 200 in number, and many of them go quite naked. W. Long. 21. 25. N. Lat. 15. 5.

MAYO, a county of Ireland, in the province of Connaught, 62 miles in length, and 52 in breadth, bounded on the east and north-east by Roscommon, by Sligo on the west, by the sea on the north, and by Galway on the south. The air is moist and cold, especially upon the mountains, where also the soil is poor and coarse; but in other parts the pasture is good, with herds of cattle and deer, &c. In this county is a fresh-water lake called *Lough mask*, about 11 miles long, and five broad, abounding with fish, particularly salmon. Hereabouts were formerly seated the Galloglaives, a people descended from the Scots of the western isles, who used to fight in coats of mail with two-edged battle-axes. The principal town is also called *Mayo*, which was formerly a bishop's see; but the bishopric has since been annexed to Tuam. It is now much decayed, but gives the title of viscount to the family of Bourke. W. Long. 9. 39. N. Lat. 53. 40.

MAYOR, the chief magistrate of a city or town, chosen annually out of the aldermen. The word, anciently wrote *meyr*, comes from the British *miret*, i. e. *custodire*, or from the old English *maier*, viz. *potestas*, and not from the Latin *major*. King Richard I. in 1189, changed the bailiff of London into a mayor, and from that example king John made the bailiff of King's Lynn a mayor anno 1204: Though the famous city of Norfolk obtained not this title for its chief magistrate till the seventh year of king Henry V. anno 1419; since which there are few towns of note but have had a mayor appointed for government.

Mayors of corporations are justices of peace *pro tempore*, and they are mentioned in several statutes; but no person shall bear any office of magistracy concerning the government of any town, corporation, &c. who hath not received the sacrament according to the church of England within one year before his election, and who shall not take the oaths of supremacy, &c.

If any person intrudes into the office of mayor, a *quo warranto* lies against him, upon which he shall not only be ousted, but fined. And no mayor, or person holding an annual office in a corporation for one year, is to be elected into the same office for the next; in this case, persons obstructing the choice of a successor are subject to 100 l. penalty. Where the mayor of a corporation is not chosen on the day appointed by charter, the next office in place shall the day after hold a court and elect one; and if there be a default or omission that way, the electors may be compelled to choose a mayor, by a writ of mandamus out of the king's bench. Mayors, or other magistrates of a corporation, who shall voluntarily absent themselves on the day of election, are liable to be imprisoned and disqualified from holding any office in the corporation.

MAZAGAN, a strong place of Africa, in the kingdom

Mayo  
Masagan.

**Mazara** kingdom of Morocco, and on the frontiers of the province of Duguela. It was fortified by the Portuguese, and besieged by the king of Morocco with 200,000 men in 1562, but to no purpose. It is situated near the sea. W. Long. 7. 45. N. Lat. 33. 5.

**MAZARA**, an ancient town of Sicily, and capital of a considerable valley of the same name, which is very fertile, and watered with several rivers. The town is a bishop's see, and has a good harbour; it is seated on the sea coast, in E. Long. 12. 39. N. Lat. 37. 42.

**MAZARINE** (Julius), a famous cardinal and prime minister of France, was born at Piccina in the province of Abruzzo, in Naples, in 1602. After having finished his studies in Italy and Spain, he entered into the service of cardinal Sacchetti, and became well skilled in politics, and in the interests of the princes at war in Italy; by which means he was enabled to bring affairs to an accommodation, and the peace of Queiras was shortly concluded. Cardinal Richelieu being taken with his conduct, did from thenceforward highly esteem him; as did also cardinal Antonio, and Lewis XIII. who procured him a cardinal's hat in 1641. Richelieu made him one of the executors of his will, and during the minority of Lewis XIV. he had the charge of affairs. At last he became the envy of the nobility, which occasioned a civil war; whereupon Mazarine was forced to retire, a price was set on his head, and his library sold. Notwithstanding, he afterwards returned to the court in more glory than ever; concluded a peace with Spain, and a marriage treaty betwixt the king and the infant. This treaty of peace passes for the masterpiece of cardinal de Mazarine's politics, and procured him the French king's most intimate confidence; but at last his continual application to business threw him into a disease, of which he died at Vincennes in 1661.—Cardinal Mazarine was of a mild and affable temper. One of his greatest talents was his knowing mankind, and his being able to adapt himself and to assume a character conformable to the circumstances of affairs. He possessed at one and the same time the bishopric of Metz, and the abbey of St Arnould, St Clement, and St Vincent, in the same city; that of St Dennis, Clugny, and Victor, of Marseilles; of St Michael at Soissons, and a great number of others. He founded Mazarine-college at Paris, which is also called the *college of the four nations*. There has been published a collection of his letters, the most copious edition of which is that of 1745, in 2 vols duodecimo.

**MEAD**, an agreeable liquor, made of honey and water.

There are many receipts for making mead, of which the following is one of the best. Take four gallons of water, and as much honey as will make it bear an egg; add to this the rind of three lemons: boil it, and scum it well as it rises. Then take it off the fire, and add the three lemons cut in pieces: pour it into a clean tub or open vessel, and let it work for three days: then scum it well, and pour off the clear part into a cask. Let it stand open till it cease to make a hissing noise; then stop it up close, and in three months time it will be fine and fit for bottling.—If you would give it a finer flavour, take cloves,

mace, and nutmeg, of each four drams; beat them small, tie the powder in a piece of cloth, and put it into the cask.

**MEAD** (Dr Richard), a celebrated English Physician, was born at Stepney near London, where his father, the Reverend Mr Matthew Mead, had been one of the two ministers of that parish; but in 1662 was ejected for nonconformity, but continued to preach at Stepney till his death. As Mr Mead had a handsome fortune, he bestowed a liberal education upon 13 children, of whom Richard was the eleventh; and for that purpose kept a private tutor in his house, who taught him the Latin tongue. At 16 years of age Richard was sent to Utrecht, where he studied three years under the famous Grævius; and then choosing the profession of physic, he went to Leyden, where he attended the lectures of the famous Piccairn on the theory and practice of medicine, and Hermon's botanical courses. Having also spent three years in these studies, he went with his brother and two other gentlemen to visit Italy, and at Padua took his degree of doctor of philosophy and physic in 1695. Afterwards he spent some time at Naples and at Rome; and returning home the next year, settled at Stepney, where he married, and practised physic with a success that laid the foundation of his future greatness.

In 1703, Dr Mead having communicated to the Royal Society an analysis of Dr Bonomo's discoveries relating to the cutaneous worms that generate the itch, which they inserted in the Philosophical Transactions; this, with his account of poisons, procured him a place in the Royal Society, of which Sir Isaac Newton was then president. The same year he was elected physician of St Thomas's hospital, and was also employed by the surgeons to read anatomical lectures in their hall, which obliged him to remove into the city. In 1707 his Paduan diploma for doctor of physic was confirmed by the university of Oxford; and being patronized by Dr Radcliffe, on the death of that famous physician he succeeded him in his house at Bloomsbury-square, and in the greatest part of his business. In 1727 he was made physician to king George II. whom he had also served in that capacity while he was prince of Wales; and he had afterwards the pleasure of seeing his two sons-in-law, Dr Nichols and Dr Wilmot, his coadjutors in that eminent station.

Dr Mead was not more to be admired for the qualities of the head than he was to be loved for those of his heart. Though he was himself a hearty whig, yet, uninfluenced by party-principles, he was a friend to all men of merit, by whatever denomination they might happen to be distinguished. Thus he was intimate with Garth, with Arbuthnot, and with Freind; and long kept up a constant correspondence with the great Boerhaave, who had been his fellow-student at Leyden: they communicated to each other their observations and projects, and never loved each other the less for being of different sentiments. In the mean time, intent as Dr Mead was on the duties of his profession, he had a greatness of mind that extended itself to all kinds of literature, which he spared neither pains nor money to promote. He caused the beautiful and splendid edition of Thuanus's history to be

Mead.



Mayne,  
Meadow.

published in 1713, in seven volumes folio: and by his interposition and affidavit, Mr Sutton's invention of drawing foul air from ships and other close places was carried into execution, and all the ships in his majesty's navy provided with this useful machine. Nothing pleased him more than to call hidden talents into light; to give encouragement to the greatest projects, and to see them executed under his own eye. During almost half a century he was at the head of his business, which brought him one year above seven thousand pounds, and for several years between five and six thousand: Yet clergymen, and in general all men of learning, were welcome to his advice. His library consisted of 10,000 volumes, of which his Latin, Greek, and oriental manuscripts made no inconsiderable part. He had a gallery for his pictures and antiquities, which cost him great sums. His reputation, not only as a physician, but as a scholar, was so universally established, that he corresponded with all the principal literati in Europe: even the king of Naples sent to desire a complete collection of his works; and in return, made him a present of the two first volumes of Signior Bajardi, which may be considered as an introduction to the collection of the antiquities of Herculaneum. At the same time that prince invited him to his palace, that he might have an opportunity of showing him those valuable monuments of antiquity; and nothing but his great age prevented his undertaking a journey so suited to his taste. No foreigner of learning ever came to London without being introduced to Dr Mead; and on these occasions his table was always open, and the magnificence of princes was united with the pleasures of philosophers. It was principally to him that the several counties of England and our colonies abroad applied for the choice of their physicians, and he was likewise consulted by foreign physicians from Russia, Prussia, Denmark, &c. He wrote, besides the above works, 1. *A Treatise on the Scurvy*. 2. *De variolis et morbillis dissertatio*. 3. *Medica sacra: sive de Morbis insignioribus, qui in Bibliis memorantur, Commentarius*. 4. *Monita et Præcepta medica*. 5. *A Discourse concerning pestilential contagion, and the methods to be used to prevent it*. The works he wrote and published in Latin were translated into English, under the doctor's inspection, by Thomas Stack, M. D. and F. R. S. This great physician, naturalist, and antiquarian, died on the 16th of February 1754.

MEADOW, in its general signification means pasture or grass-land, annually mown for hay: but it is more particularly applied to lands that are so low

as to be too moist for cattle to graze upon them in winter without spoiling the sward. Too much, or too little water is almost equally prejudicial to meadows; but the best land for meadows is a rich soil, that has a moist bottom, especially where a small brook may be brought over it, and where there is such a descent that the water will not lodge: These are better than those by great rivers, where the crops are often lost. Those that may be overflowed at pleasure, are called *water-meadows*: these should never be overflowed till the end of March, except once or twice in winter, when there are such floods as bring down a great deal of soil from the upper lands; and if the season should prove dry, it will be of great service to the grass if the meadows are overflowed again; but then the cattle should not be turned in till the sward is dry enough to bear their weight. Miller recommends the weeding of meadows in April and October with a spaddle, and rolling them with a heavy roller in spring and autumn.

MEAN, in general, denotes the middle between two extremes: thus we say the mean distance, mean proportion, &c.

MEASLES, a cutaneous disease attended with a fever, in which there is an appearance of eruptions that do not tend to a suppuration. See (the *Index* subjoined to) *MEDICINE*.

MEASURE, in geometry, denotes any quantity assumed as one, or unity, to which the ratio of the other homogeneous or similar quantities is expressed.

MEASURE, in a legal and commercial sense, denotes a certain quantity of any thing bought, sold, valued, or the like. Measures are then various, according to the various kinds and dimensions of the things measured. Hence arise lineal, or longitudinal measures for lines or lengths; square measures for areas or superficies; and solid or cubic measures for bodies and their capacities: all which again are very different in different countries and in different ages, and even many of them for different commodities. Whence arise other divisions of ancient and modern measures, domestic and foreign ones, dry measures, liquid measures, &c.

*Long MEASURES, or MEASURES of Application.* The English standard long measure for commerce, or that whereby the quantities of things are ordinarily estimated in the way of trade, is the yard, containing three English feet. Its divisions are the foot, span, palm, inch, and barley-corn; its multiples the pace, fathom, pole, furlong, and miles. The proportions these severally bear to each other, are expressed in the following table.

Mean  
Measure.

English

## English MEASURES of Length.

|                        |       |       |      |      |       |      |      |        |      |         |
|------------------------|-------|-------|------|------|-------|------|------|--------|------|---------|
| Barley-corns<br>3 Inch |       |       |      |      |       |      |      |        |      |         |
| 9                      | 3     | Palm  |      |      |       |      |      |        |      |         |
| 27                     | 9     | 3     | Span |      |       |      |      |        |      |         |
| 36                     | 12    | 4     | 1½   | Foot |       |      |      |        |      |         |
| 54                     | 18    | 6     | 2    | 1½   | Cubit |      |      |        |      |         |
| 108                    | 36    | 12    | 4    | 3    | 2     | Yard |      |        |      |         |
| 180                    | 60    | 20    | 6½   | 5    | 3½    | 1½   | Pace |        |      |         |
| 216                    | 72    | 24    | 8    | 6    | 4     | 2    | 1½   | Fathom |      |         |
| 594                    | 198   | 66    | 22   | 16½  | 11    | 5½   | 3½   | 2½     | Pole |         |
| 23760                  | 7920  | 2640  | 880  | 660  | 440   | 220  | 132  | 110    | 40   | Furlong |
| 190080                 | 63360 | 21120 | 7040 | 5280 | 3520  | 1760 | 1056 | 880    | 320  | 8 Mile. |

## Scripture MEASURES of Length reduced into English.

| Scripture MEASURES of Length reduced into English. |      |      |       |                 |  |  |  |  |  | Eng. $\frac{1}{2}$ Dec. |
|--|------|------|-------|-----------------|--|--|--|--|--|-------------------------|
| Digit  |      |      |       |                 |  |  |  |  |  | feet.                   |
|  |      |      |       |                 |  |  |  |  |  | 0 0.912                 |
| 4  | Palm |      |       |                 |  |  |  |  |  | 0 3.648                 |
| 12   | 3    | Span |       |                 |  |  |  |  |  | 0 10.944                |
| 24   | 6    | 2    | Cubit |                 |  |  |  |  |  | 1 9.888                 |
| 96   | 24   | 8    | 4     | Fathom          |  |  |  |  |  | 7 3.552                 |
| 144  | 36   | 12   | 6     | 1 $\frac{1}{2}$ | Ezechiel's reed                                  |  |  |  |  | 10 11.328               |
| 192  | 48   | 16   | 8     | 2               | 1 $\frac{1}{2}$ Arabian pole                     |  |  |  |  | 14 7.104                |
| 1920   | 480  | 160  | 80    | 20              | 13 $\frac{1}{2}$ 10 Schoenus, or measuring line. |  |  |  |  | 145 11.04               |

## The longer Scripture MEASURES.

| The longer Scripture MEASURES. |         |                    |              |                   | English |        |       |
|--------------------------------|---------|--------------------|--------------|-------------------|---------|--------|-------|
| Cubit                          |         |                    |              |                   | Miles.  | Paces. | Feet. |
|                                |         |                    |              |                   | 0       | 0      | 1.824 |
| 400                            | Stadium |                    |              |                   | 0       | 145    | 4.6   |
| 2000                           | 5       | Sab. day's journey |              |                   | 0       | 729    | 3.000 |
| 4000                           | 10      | 2                  | Eastern mile |                   | 1       | 403    | 1.000 |
| 12000                          | 30      | 6                  | 3            | Parasang          | 4       | 153    | 3.000 |
| 96000                          | 240     | 48                 | 24           | 8 a day's journey | 33      | 172    | 4.000 |

Grecian MEASURES of Length reduced to English.

| Grecian MEASURES of Length reduced to English. |                 |                  |                     |                 |                 |                     |                 |              |             | English.     |                       |
|--|-----------------|------------------|---------------------|-----------------|-----------------|---------------------|-----------------|--------------|-------------|--------------|-----------------------|
|  |                 |                  |                     |                 |                 |                     |                 |              |             | Paces, feet. | dec.                  |
| Dactylus, digit                                |                 |                  |                     |                 |                 |                     |                 |              |             | 0 0          | 0.7554 $\frac{7}{8}$  |
| 4  | Doron, dochme   |                  |                     |                 |                 |                     |                 |              |             | 0 0          | 3.0218 $\frac{1}{4}$  |
| 10   | 2 $\frac{1}{2}$ | Lichas           |                     |                 |                 |                     |                 |              |             | 0 0          | 7.5546 $\frac{7}{8}$  |
| 11   | 2 $\frac{1}{3}$ | 1 $\frac{1}{10}$ | Orthodoron          |                 |                 |                     |                 |              |             | 0 0          | 8.3101 $\frac{9}{10}$ |
| 12   | 3               | 1 $\frac{1}{7}$  | 1 $\frac{1}{11}$    | Spithame        |                 |                     |                 |              |             | 0 0          | 9.0656 $\frac{1}{4}$  |
| 16   | 4               | 1 $\frac{6}{10}$ | 1 $\frac{1}{11}$    | 1 $\frac{1}{2}$ | Foot            |                     |                 |              |             | 0 1          | 0.0875                |
| 18   | 4 $\frac{1}{2}$ | 1 $\frac{4}{7}$  | 1 $\frac{1}{11}$    | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | Cubit               |                 |              |             | 0 1          | 1.5984 $\frac{3}{8}$  |
| 20   | 5               | 2                | 1 $\frac{9}{11}$    | 1 $\frac{3}{4}$ | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$     | Pygon           |              |             | 0 1          | 3.109 $\frac{1}{8}$   |
| 24   | 6               | 2 $\frac{3}{4}$  | 2 $\frac{1}{11}$    | 2               | 2 $\frac{1}{2}$ | 1 $\frac{1}{2}$     | 1 $\frac{1}{2}$ | Cubit larger |             | 0 1          | 6.13125               |
| 96   | 24              | 9 $\frac{3}{4}$  | 8 $\frac{8}{11}$    | 8               | 6               | 5 $\frac{1}{2}$     | 4 $\frac{1}{2}$ | 4            | Pace        | 0 6          | 0.525                 |
| 9600   | 2400            | 960              | 872 $\frac{8}{11}$  | 800             | 600             | 533 $\frac{1}{11}$  | 480             | 400          | 100 Furlong | 100 4        | 4.5                   |
| 76800  | 19200           | 7680             | 6981 $\frac{9}{11}$ | 6400            | 6800            | 4266 $\frac{6}{11}$ | 3840            | 3200         | 800         | 8 Mile       | 805 5 0               |

Roman MEASURES of Length-reduced to English.

| Roman MEASURES of Length-reduced to English. |       |              |                 |                 |                    |        |        |         |          | English.     |      |        |
|--|-------|--------------|-----------------|-----------------|--------------------|--------|--------|---------|----------|--------------|------|--------|
|  |       |              |                 |                 |                    |        |        |         |          | Paces, feet. | den. |        |
| Digitus transversus                          |       |              |                 |                 |                    |        |        |         |          | 0            | 0    | 0.725  |
| 1 $\frac{1}{2}$                              | Uncia |              |                 |                 |                    |        |        |         |          | 0            | 0    | 0.967  |
| 4  | 3     | Palmus minor |                 |                 |                    |        |        |         |          | 0            | 0    | 2.901  |
| 16   | 12    | 4            | Pes             |                 |                    |        |        |         |          | 0            | 0    | 11.604 |
| 20   | 15    | 5            | 1 $\frac{1}{2}$ | Palmipes        |                    |        |        |         |          | 0            | 1    | 2.505  |
| 24   | 18    | 6            | 1 $\frac{1}{2}$ | 1 $\frac{1}{2}$ | Cubitus            |        |        |         |          | 0            | 1    | 5.406  |
| 40   | 30    | 10           | 2 $\frac{1}{2}$ | 2               | 1 $\frac{1}{2}$    | Gradus |        |         |          | 0            | 2    | 5.04   |
| 80   | 60    | 20           | 5               | 4               | 3 $\frac{1}{2}$    | 2      | Paffus |         |          | 0            | 4    | 10.02  |
| 10000  | 7500  | 2500         | 625             | 500             | 416 $\frac{2}{3}$  | 250    | 125    | Stadium |          | 120          | 4    | 4.5    |
| 80000  | 60000 | 20000        | 5000            | 4000            | 3333 $\frac{1}{3}$ | 2000   | 1000   | 8       | Milliare | 967          | 0    | 0      |

*Square or Superficial MEASURES.* English square or superficial measures, are raised from the yard of 36 inches multiplied into itself, and thus producing 1296 square inches in the square yard: the divisions of this are square feet and inches; and the multiples; poles, roods, and acres, as in the following table.

English Square MEASURES.

| Inches  |  |  |  |  |  |  |  |  |  |  |  | Feet   |  |  |  |  |  |  |  |  |  |  |  | Yards |  |  |  |  |  |  |  |  |  |  |  | Paces |  |  |  |  |  |  |  |  |  |  |  | Poles |  |  |  |  |  |  |  |  |  |  |  | Rood |  |  |  |  |  |  |  |  |  |  |  | Acre    |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|--|--|--|--|------|--|--|--|--|--|--|--|--|--|--|--|---------|--|--|--|--|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|--|--|--|--|------|--|--|--|--|--|--|--|--|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|-----|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|
| 144     |  |  |  |  |  |  |  |  |  |  |  | 1296   |  |  |  |  |  |  |  |  |  |  |  | 9     |  |  |  |  |  |  |  |  |  |  |  | 3600  |  |  |  |  |  |  |  |  |  |  |  | 25    |  |  |  |  |  |  |  |  |  |  |  | 2    |  |  |  |  |  |  |  |  |  |  |  | 1089    |  |  |  |  |  |  |  |  |  |  |  | 39204 |  |  |  |  |  |  |  |  |  |  |  | 272   |  |  |  |  |  |  |  |  |  |  |  | 30     |  |  |  |  |  |  |  |  |  |  |  | 10.89 |  |  |  |  |  |  |  |  |  |  |  | 435.6 |  |  |  |  |  |  |  |  |  |  |  | 40   |  |  |  |  |  |  |  |  |  |  |  | 1743.6 |  |  |  |  |  |  |  |  |  |  |  | 160 |  |  |  |  |  |  |  |  |  |  |  | 4 |  |  |  |  |  |  |  |  |  |  |  |
| 1568160 |  |  |  |  |  |  |  |  |  |  |  | 108900 |  |  |  |  |  |  |  |  |  |  |  | 12100 |  |  |  |  |  |  |  |  |  |  |  | 435.6 |  |  |  |  |  |  |  |  |  |  |  | 40    |  |  |  |  |  |  |  |  |  |  |  | Rood |  |  |  |  |  |  |  |  |  |  |  | 6272640 |  |  |  |  |  |  |  |  |  |  |  | 43560 |  |  |  |  |  |  |  |  |  |  |  | 48400 |  |  |  |  |  |  |  |  |  |  |  | 1743.6 |  |  |  |  |  |  |  |  |  |  |  | 160   |  |  |  |  |  |  |  |  |  |  |  | 4     |  |  |  |  |  |  |  |  |  |  |  | Acre |  |  |  |  |  |  |  |  |  |  |  |        |  |  |  |  |  |  |  |  |  |  |  |     |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |

Grecian



Measure.

Grecian square measures were the plethron, or acre, by some said to contain 1444, by others, 10,000 square feet; and aroura, the half of the plethron. The aroura of the Egyptians was the square 100 cubits.

Roman Square MEASURE reduced to English.

THE integer was the jugerum or acre, which the Romans divided like the libra, or as: thus the jugerum contained

|          | square<br>feet. | acres. | Eng.<br>roods. | sq. poles.<br>Square<br>feet. |
|----------|-----------------|--------|----------------|-------------------------------|
| As       | 28800           | 288    | 2              | 18250.05                      |
| Drum     | 26400           | 264    | 2              | 183.85                        |
| Dextrus  | 24000           | 240    | 2              | 117.64                        |
| Dodrans  | 21600           | 216    | 1              | 34 51.42                      |
| Bei      | 19200           | 192    | 1              | 25 257.46                     |
| Septem   | 16800           | 168    | 1              | 17 191.25                     |
| Semia    | 14400           | 144    | 1              | 9 125.03                      |
| Quincunx | 12000           | 120    | 1              | 58.82                         |
| Triens   | 9600            | 96     | 0              | 32 264.85                     |
| Quadrans | 7200            | 72     | 0              | 24 198.64                     |
| Sextans  | 4800            | 48     | 0              | 16 132.43                     |
| Uncia    | 2400            | 24     | 0              | 8 66.21                       |

Note, *Actus major* was 14,400 square feet, equal to a *femis*; *clima*, 3600 square feet, equal to *fescuncia*; and *actus minimus* equal to a *sextans*.

Cubical MEASURES, or Measures of Capacity for Liquids.

The English measures were originally raised from troy weight; it being enacted by several statutes, that eight pounds troy of wheat, gathered from the middle of the ear, and well dried, should weigh a gallon of wine-measure, the divisions and multiples whereof were to form the other measures; at the same time it was also ordered, that there should be but one liquid measure in the kingdom: yet custom has prevailed, and there having been introduced a new weight, viz. the avoirdupois, we have now a second standard-gallon adjudged thereto, and therefore exceeding the former in the proportion of the avoirdupois weight to troy weight. From this latter standard are raised two several measures, the one for ale, the other for beer.

The sealed gallon at Guildhall, which is the standard for wines, spirits, oils, &c. is supposed to contain 231 cubic-inches; and on this supposition the other

measures raised therefrom, will contain as in the table underneath: yet, by actual experiment, made in 1688, before the lord-mayor and the commissioners of excise, this gallon was found to contain only 224 cubic inches: it was however agreed to continue the common supposed contents of 231 cubic inches; so that all computations stand on their old footing. Hence as 12 is to 231, so is  $14\frac{1}{2}$  to 28½ the cubic inches in the ale-gallon: but in effect the ale-quart contains 70½ cubic inches, on which principle the ale and beer-gallon will be 282 cubic inches. The several divisions and multiples of these measures, and their proportions, are exhibited in the following tables.

English MEASURE of Capacity for Liquids.

### Wine-Measure.

|                    |  |          |  |                  |  |                 |  |  |  |
|--------------------|--|----------|--|------------------|--|-----------------|--|--|--|
| Solid inches       |  |          |  |                  |  |                 |  |  |  |
| 28 $\frac{7}{8}$   |  | Pint     |  |                  |  |                 |  |  |  |
| 231                |  | 8 Gallon |  |                  |  |                 |  |  |  |
| 4158               |  | 144      |  | 18               |  | Rundlet         |  |  |  |
| 7276 $\frac{1}{2}$ |  | 252      |  | 31 $\frac{1}{2}$ |  | 1 $\frac{1}{2}$ |  | Barrel                                     |  |
| 9702               |  | 336      |  | 42               |  | 2 $\frac{1}{2}$ |  | 1 $\frac{1}{2}$ Tierce                     |  |
| 14553              |  | 504      |  | 63               |  | 3 $\frac{1}{2}$ |  | 2 $\frac{1}{2}$ Hoghead                    |  |
| 19279              |  | 672      |  | 84               |  | 4 $\frac{1}{2}$ |  | 2 $\frac{3}{4}$ 2 1 $\frac{1}{2}$ PUNCHION |  |
| 29106              |  | 1008     |  | 126              |  | 7               |  | 4 3 2 1 $\frac{1}{2}$ Butt                 |  |
| 58212              |  | 2016     |  | 252              |  | 14              |  | 8 6 4 3 2 Tun.                             |  |

Ale-Measure.

Beer-Measure.

| Pints |                | Pints |                |
|-------|----------------|-------|----------------|
| 8     | Gallon         | 8     | Gallon         |
| 64    | 8 Firkin       | 72    | 9 Firkin       |
| 128   | 16 2 Kilderkin | 144   | 18 2 Kilderkin |
| 256   | 32 4 2 Barrel  | 288   | 36 4 2 Barrel  |
| 512   | 64 8 4 2 Hog.  | 576   | 72 8 4 2 Hog.  |

Jewish MEASURES of Capacity for Liquids, reduced to English Wine-measure.

|                     |     |     |        |                     |
|---------------------|-----|-----|--------|---------------------|
| Caph                |     |     |        | -                   |
| 1 $\frac{1}{2}$ Log |     |     |        | -                   |
| 5 $\frac{1}{2}$     | 4   | Cab |        | -                   |
| 16                  | 12  | 3   | Hin    | -                   |
| 32                  | 24  | 6   | 2 Seah |                     |
| 96                  | 72  | 18  | 6      | 3 Bath, or Epha     |
| 960                 | 720 | 180 | 60     | 30 Coron, or Chomer |

| Gall. | Pints           | Solid inches. |
|-------|-----------------|---------------|
| 0     | 0 $\frac{5}{8}$ | 0.177         |
| 0     | 0 $\frac{5}{8}$ | 0.211         |
| 0     | 3 $\frac{1}{2}$ | 0.844         |
| 1     | 2               | 2.533         |
| 2     | 4               | 5.067         |
| 7     | 4               | 15.2          |
| 75    | 5               | 7.625         |

Attila

## Attic MEASURES of Capacity for Liquids, reduced to English Wine-measure.

|                |                |         |        |                |           |        |        |       |          | Gal. | Pints.         | Sol. inch. | Dec.          |
|----------------|----------------|---------|--------|----------------|-----------|--------|--------|-------|----------|------|----------------|------------|---------------|
| Cochliarion    |                |         |        |                |           |        |        |       |          | 0    | $\frac{1}{10}$ | 0.0356     | $\frac{1}{2}$ |
| 2              | Cheme          |         |        |                |           |        |        |       |          | 0    | $\frac{1}{80}$ | 0.0712     | $\frac{5}{8}$ |
| $2\frac{1}{2}$ | $1\frac{1}{2}$ | Myftron |        |                |           |        |        |       |          | 0    | $\frac{1}{24}$ | 0.089      | $\frac{1}{8}$ |
| 5              | $2\frac{1}{2}$ | 2       | Conche |                |           |        |        |       |          | 0    | $\frac{1}{12}$ | 0.178      | $\frac{1}{4}$ |
| 10             | 5              | 4       | 2      | Cyathos        |           |        |        |       |          | 0    | $\frac{1}{12}$ | 0.356      | $\frac{1}{2}$ |
| 15             | $7\frac{1}{2}$ | 6       | 3      | $1\frac{1}{2}$ | Oxybaphon |        |        |       |          | 0    | $\frac{1}{8}$  | 0.535      | $\frac{1}{8}$ |
| 60             | 30             | 24      | 12     | 6              | 4         | Cotyle |        |       |          | 0    | $\frac{1}{2}$  | 2.141      | $\frac{1}{2}$ |
| 120            | 60             | 48      | 24     | 12             | 8         | 2      | Xestes |       |          | 0    | 1              | 4.283      |               |
| 720            | 360            | 288     | 144    | 72             | 48        | 12     | 6      | Chous |          | 0    | 6              | 25.698     |               |
| 8640           | 4320           | 3456    | 1728   | 864            | 576       | 144    | 72     | 12    | Metretes | 10   | 2              | 19.629     |               |

## Roman MEASURES of Capacity for Liquids, reduced to English Wine-measure.

|        |                |            |            |        |           |         |      |         | Gal.   | Pints.          | Dec.               |        |
|--------|----------------|------------|------------|--------|-----------|---------|------|---------|--------|-----------------|--------------------|--------|
| Ligula |                |            |            |        |           |         |      |         | 0      | $0\frac{1}{28}$ | $0.117\frac{1}{2}$ |        |
| 4      | Cyathus        |            |            |        |           |         |      |         | 0      | $0\frac{1}{14}$ | $0.469\frac{3}{4}$ |        |
| 6      | $1\frac{1}{2}$ | Acetabulum |            |        |           |         |      |         | 0      | $0\frac{1}{8}$  | $0.704\frac{1}{2}$ |        |
| 12     | 3              | 2          | Quartarius |        |           |         |      |         | 0      | $0\frac{1}{4}$  | 1.409              |        |
| 24     | 6              | 4          | 2          | Hemina |           |         |      |         | 0      | $0\frac{1}{2}$  | 2.818              |        |
| 48     | 12             | 8          | 4          | 2      | Sextarius |         |      |         | 0      | 1               | 5.636              |        |
| 288    | 72             | 48         | 24         | 12     | 6         | Congius |      |         | 0      | 7               | 4.942              |        |
| 1152   | 288            | 192        | 96         | 48     | 24        | 4       | Urna |         | 3      | $4\frac{1}{2}$  | 5.33               |        |
| 2304   | 576            | 384        | 192        | 96     | 48        | 8       | 2    | Amphora | 7      | 1               | 10.66              |        |
| 46080  | 11520          | 7680       | 3840       | 1920   | 960       | 160     | 40   | 20      | Culeus | 143             | 3                  | 11.095 |

In the modern liquid measures of foreign nations, it is to be observed, that their several vessels for wine, vinegar, &c. have also various denominations according to their different sizes and the places wherein they are used. The wooders of Germany, for holding Rhenish and Moselle wines, are different in their gauges; some containing 14 aumes of Amsterdam-measure, and others more or less. The aume is reckoned at Amsterdam for 8 steckans, or 20 verges, or for  $\frac{1}{8}$  of a ton of 2 pipes; or 4 barrels of French or Bourdeaux, which  $\frac{1}{8}$  at this latter place is called *tiercon*, because 3 of them make a pipe or 2 barrels, and 6 the said ton. The steckan is 16 mingles, or 32 pints; and the verge is, in respect of the said Rhenish and Moselle, and some other sorts of wine, 6 mingles;

but, in measuring brandy, it consists of  $6\frac{1}{2}$  mingles. The aume is divided into 4 anckers, and the ancker into 2 steckans, or 32 mingles. The ancker is taken sometimes for  $\frac{1}{12}$  of a ton, or 4 barrels; on which footing the Bourdeaux-barrel ought to contain at Amsterdam (when the cask is made according to the just gauge)  $12\frac{1}{2}$  steckans, or 200 mingles wine and lees; or 12 steckans, or a 192 mingles racked wine; so that the Bourdeaux-ton of wine contains 50 steckans, or 800 mingles, wine and lees; and 48 steckans, or 768 mingles of pure wine. The barrels or poinçons of Nantes and other places on the river Loire, contain only 12 steckans Amsterdam measure. The wine-ton of Rochelle, Cognac, Charente, and the Isle of Rhé, differs very little from the ton of

Bour-

the Paris pint is nearly equal to the English wine-Measure.  
quart.

The butts or pipes from Cadiz, Malaga, Alicante, Benecarlo, Saloe, and Mataro, and from the Canaries, from Lisbon, Oporto, and Fayal, are very different in their gauges, though in affreightments they are all reckoned two to the ton.

Vinegar is measured in the same manner as wine; but the measures for brandies are different: these spirits from France, Spain, Portugal, &c. are generally shipped in large casks called *pipes*, *butts*, and *pieces*, according to the places from whence they are reported, &c. In France, brandy is shipped in casks called *pieces* at Bourdeaux, and *pipes* at Rochelle, Cognac, the Isle of Rhé, and other neighbouring places, which contain some more and some less, even from 60 to 90 Amsterdam-veers or veertels, according to the capacity of the vessels, and the places they come from, which being reduced into barrels will stand as follows, viz.

the country of Aunis

At Rochelle, Cognac, the Isle of Rhé, and the country of Aunis

At Nantz, and several places of Bretagne and Anjou

At Bourdeaux, and different parts of Guienne

At Amsterdam, and other cities of Holland

At Hamburg and Lubeck

At Embden —

27 Veertels }  
 29 Veertels }  
 32 Verges }  
 30 Veertels }  
 30 Verges }  
 27 Verges } per barrel.

In Provence and Languedoc, brandy is sold by the quintal, the casks included; and at Bruges, in Flanders, the verges are called *sefters* of 16 stops each, and the spirit is sold at so much per stop.

Olive-oil is also shipped in casks of various sizes, according to the custom of the places where it is embarked, and the conveniency of stowage. In England it is sold by the ton of 236 gallons; and at Amsterdam by the ton of 717 mingles, or 1434 pints. In Provence it is sold by milleroles of 66 Paris-pints: from Spain and Portugal it is brought in pipes, or butts, of different gauges; at the first place it is sold by roves, whereof 40 go to the butt; and at the latter place by almoudas, whereof 26 makes a pipe. Train-oil is sold in England by the ton, at Amsterdam by the barrel.

MEASURES of capacity for things dry. English dry or corn measures are raised from the Winchester-gallon, which contains  $272\frac{1}{2}$  solid inches, and ought to hold of pure running water 9 pounds 13 ounces. This seems to stand on the foot of the old wine-gallon

of 224 cubic inches, 12 being to  $14\frac{1}{2}$  as 224 to 272; but by an act of parliament made in 1697 it is decreed, that a round bushel, 18 $\frac{1}{2}$  inches wide and 8 deep, is a legal Winchester-bushel. Now such a bushel will only hold 2150.42 cubic inches; consequently the gallon will hold 268.8 cubic inches, the divisions and multiples whereof are as in the following table.

English dry or corn-measure.

|              |      |        |               |
|--------------|------|--------|---------------|
| Solid inches |      |        |               |
| 33.6         | Pint |        |               |
| 268.8        | 8    | Gallon |               |
| 537.6        | 16   | 2 Peck |               |
| 2150.4       | 64   | 8      | 4 Bushels     |
| 17203.2      | 512  | 64     | 32 8 Quarter. |

Scripture MEASURES of Capacity for things dry, reduced to English Corn-measure.

| Gachal |  | Cab |  | 36 1 $\frac{4}{9}$ Gomor |  | 120 6 3 $\frac{1}{2}$ Seah |  | 360 18 10 3 Epha |  | 1800 90 50 15 5 Leteeth |  | 3600 180 100 30 10 2 Chomer, or coron |  | Dec.   | Sol. inch. | Pint. | Gal. | Pek. |
|--------|--|-----|--|--------------------------|--|----------------------------|--|------------------|--|-------------------------|--|---------------------------------------|--|--------|------------|-------|------|------|
|        |  |     |  |                          |  |                            |  |                  |  |                         |  |                                       |  | 0.034  | 0.0147     | 0     | 0    | 0    |
|        |  |     |  |                          |  |                            |  |                  |  |                         |  |                                       |  | 0.073  | 0.029      | 2     | 0    | 0    |
|        |  |     |  |                          |  |                            |  |                  |  |                         |  |                                       |  | 1.211  | 0.475      | 5     | 1    | 0    |
|        |  |     |  |                          |  |                            |  |                  |  |                         |  |                                       |  | 4.036  | 1.51       | 1     | 0    | 1    |
|        |  |     |  |                          |  |                            |  |                  |  |                         |  |                                       |  | 12.107 | 4.53       | 3     | 0    | 3    |
|        |  |     |  |                          |  |                            |  |                  |  |                         |  |                                       |  | 26.500 | 9.07       | 0     | 0    | 16   |
|        |  |     |  |                          |  |                            |  |                  |  |                         |  |                                       |  | 18.969 | 6.76       | 1     | 0    | 32   |



Attic MEASURES of Capacity for things dry, reduced to English Corn measure.

|                                    |  |  |  |  | Pck. | Gal. | Pin. | Sol. Inch. | Dec.           |
|------------------------------------|--|--|--|--|------|------|------|------------|----------------|
| Cochliarion                        |  |  |  |  | 0    | 0    | 0    | 0.276      | $\frac{1}{10}$ |
| 10 Cyathos                         |  |  |  |  | 0    | 0    | 0    | 2.763      | $\frac{1}{2}$  |
| 15 $1\frac{1}{2}$ Oxybaphon        |  |  |  |  | 0    | 0    | 0    | 4.144      | $\frac{3}{4}$  |
| 60 6 4 Cotyle                      |  |  |  |  | 0    | 0    | 0    | 16.579     |                |
| 120 12 8 2 Kestes                  |  |  |  |  | 0    | 0    | 0    | 33.158     |                |
| 180 18 12 3 $1\frac{1}{2}$ Choenix |  |  |  |  | 0    | 0    | 1    | 15.705     | $\frac{1}{2}$  |
| 8640 864 576 144 72 48 Medimnos    |  |  |  |  | 4    | 0    | 6    | 3.501      |                |

Roman MEASURES of Capacity for things dry, reduced to English Corn-measure.

|                             |  |  |  |  | Pck. | Gal. | Pin.           | Sol. Inch. | Dec. |
|-----------------------------|--|--|--|--|------|------|----------------|------------|------|
| Ligula                      |  |  |  |  | 0    | 0    | $0\frac{1}{8}$ | 0.01       |      |
| 4 Cyathus                   |  |  |  |  | 0    | 0    | $0\frac{1}{8}$ | 0.04       |      |
| 6 $1\frac{1}{2}$ Acetabulum |  |  |  |  | 0    | 0    | $\frac{1}{8}$  | 0.06       |      |
| 24 6 4 Hemina               |  |  |  |  | 0    | 0    | $8\frac{1}{4}$ | 0.24       |      |
| 48 12 8 2 Sextarius         |  |  |  |  | 0    | 0    | 1              | 0.48       |      |
| 384 96 64 16 8 Semimodius   |  |  |  |  | 0    | 1    | 0              | 3.84       |      |
| 768 192 128 32 16 2 Modius  |  |  |  |  | 1    | 0    | 0              | 7.68       |      |

In the several parts of Europe, falt, which is a more staple and current commodity than any other, is bought and sold by different measures, according to the several places of its dispatch; at Amsterdam it is sold by the cent of 404 measures or scheppels, which cent is reckoned to be 7 lafts or 14 tons, and the laft is to weigh 4000lb. the 7 lafts making 28000lb. called the *cent of falt*, which also contains 208 sacks; though some of this commodity is much heavier than others. In the cities of France, falt is sold by the muid, whose size varies according to the different places of its manufacture and dispatch. At Paris this measure is reckoned to contain 12 setiers, or 48 minots, which minot is also divided into other measures. The cent of falt from Marans, Brouage, Sude, and the isle of Rhé, contain 28 stricken muids, and each muid 24 boisseaux, which yields at Amsterdam

$11\frac{1}{2}$  lafts, or 23 tons, more or less. In Copenhagen the said cent renders only  $9\frac{1}{2}$  lafts, the laft being reckoned here equal to 18 tons, and 50 lafts to correspond with 52 of Coningsberg, at which place the cent produces about 10 lafts, or 40,000lb. At Riga the said cent yields the same measure as at Coningsberg; and about  $6\frac{1}{2}$  lafts of Riga make the great cent of Amsterdam. The said French cent produces at Dantzick from  $11\frac{1}{2}$  to 12 lafts, of which lafts from  $7\frac{1}{2}$  to  $7\frac{1}{2}$  make likewise the great cent of Amsterdam. At Stetin in Pomerania, the French cent yielded 10 lafts, making 40,000 measure and weight of the said place. In Portugal it is bought by the muid, of which four make a laft, and seven the cent of Amsterdam. At Alamat and Ivica it is sold by the modin, which weighs from  $27\frac{1}{2}$  to 2800cwt. English.

A TABLE, representing the Conformity which the LONG MEASURES of the principal kind, by the Sieur JEAN LARUE Merchant at Lyons, in his Treatise dedicated to ENGLAND or London in the Front, as the Sieur LARUE has done PARIS for the use

☞ The ells of Amsterdam, Haerlem, Leyden, the Hague, Rotterdam, and other cities of Holland, as well as the ell of Nuremberg, are equal among themselves. They are also comprehended under the ell of Amsterdam, as that of Osnaburgh is under that of France and England, and the end of Bern and Basil under that of Hamburg, Frankfort, and Leipzig.

|   | A   | B                           | C                              | D                             | E                                  | F                           | G                 |
|---|---|-----------------------------|--------------------------------|-------------------------------|------------------------------------|-----------------------------|-------------------|
|   | Yards of England, Scotl. and Irel.          | Ells of France and England. | Ells of Holland and Amsterdam. | Ells of Antwerp and Brussels. | Ells of Hamb. Frankf. and Cologne. | Ells of Breslaw in Silesia. | Ells of Dantzick. |
| A | 100 Yards of Scotland, England, and Ireland | 78                          | 133                            | 131                           | 160                                | 166                         | 166               |
| B | 100 Ells of France and England              | 100                         | 173                            | 166                           | 205                                | 213                         | 213               |
| C | 100 Ells of Holland or Amsterdam            | 75                          | 100                            | 98                            | 120                                | 125                         | 125               |
| D | 100 Ells of Antwerp and Brussels            | 76                          | 60                             | 101                           | 151                                | 126                         | 126               |
| E | 100 Ells of Hamburg, Frankfort, &c.         | 62                          | 48                             | 83                            | 82                                 | 100                         | 104               |
| F | 100 Ells of Breslaw in Silesia              | 60                          | 46                             | 80                            | 79                                 | 96                          | 100               |
| G | 100 Ells of Dantzick                        | 66                          | 52                             | 89                            | 87                                 | 96                          | 111               |
| H | 100 Ells of Bergen and Drontheim            | 67                          | 52                             | 90                            | 89                                 | 108                         | 112               |
| I | 100 Ells of Sweden or Stockholm             | 65                          | 51                             | 87                            | 86                                 | 105                         | 109               |
| K | 100 Ells of St Gall for linen               | 87                          | 67                             | 116                           | 114                                | 139                         | 145               |
| L | 100 Ells of St Gall for cloth               | 97                          | 52                             | 89                            | 88                                 | 107                         | 111               |
| M | 100 Ells of Geneva                          | 124                         | 97                             | 166                           | 164                                | 200                         | 208               |
| N | 100 Canes of Marseilles and Montpelier      | 214                         | 167                            | 286                           | 282                                | 343                         | 357               |
| O | 100 Canes of Toulouse and Upper Languedoc   | 199                         | 156                            | 266                           | 163                                | 320                         | 333               |
| P | 100 Canes of Genoa of 9 palmos              | 245                         | 191                            | 327                           | 323                                | 392                         | 408               |
| Q | 100 Canes of Rome                           | 227                         | 177                            | 303                           | 299                                | 363                         | 378               |
| R | 100 Vares of Castile and Biscay             | 93                          | 73                             | 125                           | 123                                | 150                         | 156               |
| S | 100 Vares of Cadiz and Andalusia            | 91                          | 71                             | 122                           | 119                                | 146                         | 152               |
| T | 100 Vares of Portugal or Lisbon             | 123                         | 96                             | 164                           | 162                                | 96                          | 205               |
| V | 100 Covedos of Portugal or Lisbon           | 74                          | 58                             | 100                           | 98                                 | 120                         | 125               |
| W | 100 Brasses of Venice                       | 73                          | 57                             | 98                            | 96                                 | 117                         | 122               |
| X | 100 Brasses of Bergamo, &c.                 | 72                          | 55                             | 95                            | 93                                 | 114                         | 118               |
| Y | 100 Brasses of Florence, Leghorn, &c.       | 65                          | 50                             | 85                            | 84                                 | 102                         | 106               |
| Z | 100 Brasses of Milan                        | 58                          | 45                             | 78                            | 77                                 | 93                          | 97                |

Make

N. B. By means of this Table, the reader may please to observe, that 100 ells of Paris and of England By the common rule of three, or proportion



A TABLE, representing the Conformity which the LONG MEASURES of the principal TRADING CITIES of EUROPE have with each other, published in 1747, as the most authentic of its kind, by the Sieur JEAN LARUE Merchant at Lyons, in his Treatise dedicated to the Count de MAUREPAS: with the difference only of transposing one of the Columns, in order to place ENGLAND or London in the Front, as the Sieur LARUE has done PARIS for the use of the French nation more particularly.

⚡ The ells of Amsterdam, Haerlem, Leyden, the Hague, Rotterdam, and other cities of Holland, as well as the ell of Nuremberg, are equal among themselves. They are also comprehended under the ell of Amsterdam, as that of Osnaburgh is under that of France and England, and the end of Bern and Basil under that of Hamburg, Frankfort, and Leipfic.

|   | A                                   | B                            | C                                | D                               | E                                   | F                            | G                  | H                              | I                              | K                           | L                          | M                | N                                      | O                                      | P                             | Q              | R                             | S                               | T                              | V                                | W                   | X                                   | Y                                      | Z                 |
|---|-------------------------------------|------------------------------|----------------------------------|---------------------------------|-------------------------------------|------------------------------|--------------------|--------------------------------|--------------------------------|-----------------------------|----------------------------|------------------|--|--|-------------------------------|----------------|-------------------------------|---------------------------------|--------------------------------|----------------------------------|---------------------|-------------------------------------|--|-------------------|
|   | Yards of Eng-land, Scotl. and Irel. | Ells of France and Eng-land. | Ells of Hol-land and Amster-dam. | Ells of Ant-werp and Brus-sels. | Ells of Hamb. Frankf. and Co-logne. | Ells of Breslaw in Sile-sia. | Ells of Dant-zick. | Ells of Bergen and Dron-theim. | Ells of Swe-den or Stock-holm. | Ells of St Gall for li-nen. | Ells of St Gall for cloth. | Ells of Gene-va. | Canes of Mar-feilles and Mont-pelcier. | Canes of Tou-loufe, Albi, and Castres. | Canes of Ge-noa of 9 pal-mos. | Canes of Rome. | Vares of Caf-tile and Biscay. | Vares of Ca-diz and Anda-lusia. | Vares of Por-tugal or Lif-bon. | Cove-dos of Portu-gal or Lifbon. | Brasses of Ve-nice. | Brasses of Boulog. Mod. and Mantua. | Brasses of Flo-rence, Legh. and Lucca. | Brasses of Milan. |
| A 100 Yards of Scotland, England, and Ireland | 100                                 | 78                           | 133                              | 131                             | 160                                 | 166                          | 150                | 146                            | 154                            | 114                         | 149                        | 80               | 46                                     | 50                                     | 40                            | 44             | 107                           | 109                             | 81                             | 133                              | 136                 | 104                                 | 154                                    | 171               |
| B 100 Ells of France and England              | 128                                 | 100                          | 173                              | 166                             | 205                                 | 213                          | 192                | 188                            | 195                            | 147                         | 191                        | 102              | 59                                     | 64                                     | 52                            | 56             | 136                           | 140                             | 104                            | 171                              | 174                 | 179                                 | 199                                    | 219               |
| C 100 Ells of Holland or Amsterdam            | 75                                  | 75                           | 100                              | 98                              | 120                                 | 125                          | 112                | 110                            | 114                            | 87                          | 112                        | 60               | 35                                     | 37                                     | 30                            | 33             | 80                            | 81                              | 61                             | 100                              | 102                 | 105                                 | 116                                    | 128               |
| D 100 Ells of Antwerp and Brussels            | 76                                  | 60                           | 101                              | 100                             | 151                                 | 126                          | 114                | 111                            | 116                            | 87                          | 113                        | 60               | 35                                     | 38                                     | 30                            | 33             | 81                            | 84                              | 61                             | 101                              | 103                 | 106                                 | 118                                    | 130               |
| E 100 Ells of Hamburg, Frankfort, &c.         | 62                                  | 48                           | 83                               | 82                              | 100                                 | 104                          | 92                 | 91                             | 95                             | 71                          | 91                         | 50               | 29                                     | 31                                     | 25                            | 27             | 65                            | 68                              | 50                             | 83                               | 85                  | 88                                  | 97                                     | 107               |
| F 100 Ells of Breslaw in Silesia              | 60                                  | 46                           | 80                               | 79                              | 96                                  | 100                          | 89                 | 88                             | 91                             | 68                          | 89                         | 48               | 28                                     | 30                                     | 24                            | 26             | 64                            | 65                              | 48                             | 80                               | 81                  | 84                                  | 93                                     | 102               |
| G 100 Ells of Dantzick                        | 66                                  | 52                           | 89                               | 87                              | 96                                  | 111                          | 100                | 98                             | 102                            | 76                          | 99                         | 53               | 31                                     | 33                                     | 27                            | 29             | 71                            | 72                              | 54                             | 89                               | 90                  | 93                                  | 103                                    | 114               |
| H 100 Ells of Bergen and Drontheim            | 67                                  | 52                           | 90                               | 89                              | 108                                 | 112                          | 101                | 100                            | 103                            | 77                          | 100                        | 54               | 31                                     | 33                                     | 27                            | 29             | 72                            | 74                              | 55                             | 90                               | 91                  | 94                                  | 105                                    | 115               |
| I 100 Ells of Sweden or Stockholm             | 65                                  | 51                           | 87                               | 86                              | 105                                 | 109                          | 97                 | 96                             | 100                            | 75                          | 98                         | 52               | 30                                     | 32                                     | 26                            | 28             | 70                            | 71                              | 53                             | 87                               | 89                  | 92                                  | 102                                    | 112               |
| K 100 Ells of St Gall for linen               | 87                                  | 67                           | 116                              | 114                             | 139                                 | 145                          | 130                | 127                            | 133                            | 100                         | 130                        | 69               | 40                                     | 43                                     | 35                            | 38             | 92                            | 95                              | 70                             | 116                              | 118                 | 122                                 | 133                                    | 149               |
| L 100 Ells of St Gall for cloth               | 97                                  | 52                           | 89                               | 88                              | 107                                 | 111                          | 100                | 98                             | 102                            | 76                          | 100                        | 53               | 31                                     | 33                                     | 27                            | 29             | 71                            | 73                              | 54                             | 89                               | 91                  | 94                                  | 104                                    | 114               |
| M 100 Ells of Geneva                          | 124                                 | 97                           | 166                              | 164                             | 200                                 | 208                          | 187                | 183                            | 191                            | 143                         | 130                        | 100              | 58                                     | 62                                     | 50                            | 55             | 133                           | 136                             | 101                            | 166                              | 170                 | 172                                 | 193                                    | 214               |
| N 100 Canes of Marseilles and Montpelier      | 214                                 | 167                          | 286                              | 282                             | 343                                 | 357                          | 321                | 314                            | 327                            | 246                         | 320                        | 171              | 100                                    | 107                                    | 87                            | 94             | 228                           | 234                             | 174                            | 286                              | 291                 | 301                                 | 333                                    | 367               |
| O 100 Canes of Toulouse and Upper Languedoc   | 199                                 | 156                          | 266                              | 263                             | 320                                 | 333                          | 300                | 293                            | 304                            | 229                         | 298                        | 160              | 93                                     | 100                                    | 81                            | 88             | 213                           | 218                             | 162                            | 266                              | 272                 | 280                                 | 309                                    | 342               |
| P 100 Canes of Genoa of 9 palmos              | 245                                 | 191                          | 327                              | 323                             | 392                                 | 408                          | 367                | 359                            | 374                            | 281                         | 366                        | 196              | 114                                    | 122                                    | 100                           | 108            | 261                           | 268                             | 199                            | 327                              | 333                 | 344                                 | 381                                    | 420               |
| Q 100 Canes of Rome                           | 227                                 | 177                          | 303                              | 299                             | 363                                 | 378                          | 340                | 333                            | 347                            | 260                         | 339                        | 181              | 116                                    | 113                                    | 92                            | 100            | 242                           | 245                             | 184                            | 303                              | 309                 | 319                                 | 353                                    | 389               |
| R 100 Vares of Castile and Biscay             | 93                                  | 73                           | 125                              | 123                             | 150                                 | 156                          | 140                | 137                            | 143                            | 107                         | 140                        | 75               | 43                                     | 46                                     | 38                            | 41             | 100                           | 102                             | 76                             | 125                              | 127                 | 131                                 | 145                                    | 159               |
| S 100 Vares of Cadiz and Andalusia            | 91                                  | 71                           | 122                              | 119                             | 146                                 | 152                          | 138                | 134                            | 139                            | 105                         | 137                        | 73               | 42                                     | 45                                     | 37                            | 40             | 97                            | 100                             | 74                             | 122                              | 125                 | 129                                 | 142                                    | 157               |
| T 100 Vares of Portugal or Lisbon             | 123                                 | 96                           | 164                              | 162                             | 96                                  | 205                          | 184                | 180                            | 187                            | 141                         | 183                        | 94               | 57                                     | 61                                     | 50                            | 54             | 131                           | 134                             | 100                            | 164                              | 167                 | 172                                 | 191                                    | 210               |
| V 100 Covedos of Portugal or Lisbon           | 74                                  | 58                           | 100                              | 98                              | 120                                 | 125                          | 112                | 110                            | 114                            | 86                          | 112                        | 60               | 35                                     | 37                                     | 30                            | 33             | 80                            | 81                              | 61                             | 100                              | 102                 | 105                                 | 116                                    | 128               |
| W 100 Brasses of Venice                       | 73                                  | 57                           | 98                               | 96                              | 117                                 | 122                          | 104                | 107                            | 112                            | 84                          | 109                        | 58               | 34                                     | 36                                     | 29                            | 32             | 78                            | 80                              | 59                             | 98                               | 100                 | 103                                 | 114                                    | 126               |
| X 100 Brasses of Bergamo, &c.                 | 72                                  | 55                           | 95                               | 93                              | 114                                 | 118                          | 106                | 104                            | 108                            | 81                          | 106                        | 57               | 33                                     | 35                                     | 29                            | 31             | 76                            | 78                              | 58                             | 95                               | 97                  | 100                                 | 100                                    | 122               |
| Y 100 Brasses of Florence, Leghorn, &c.       | 65                                  | 50                           | 85                               | 84                              | 102                                 | 106                          | 96                 | 94                             | 98                             | 73                          | 95                         | 51               | 30                                     | 32                                     | 26                            | 28             | 68                            | 70                              | 52                             | 95                               | 87                  | 95                                  | 100                                    | 109               |
| Z 100 Brasses of Milan                        | 58                                  | 45                           | 78                               | 77                              | 93                                  | 97                           | 87                 | 85                             | 89                             | 67                          | 87                         | 46               | 27                                     | 29                                     | 23                            | 25             | 62                            | 63                              | 47                             | 78                               | 79                  | 82                                  | 91                                     | 100               |

N. B. By means of this Table, the reader may please to observe, that 100 ells of Paris and of England make 173½ of Holland; and in like manner you will find how the measures of other places in the Table correspond with each other. By the common rule of three, or proportion, you will easily make your computations for any quantity required.









MEASURE for Wood. See CORD of Wood.

MEASURE for Horfes, is the hand, which by statute contains four inches.

MEASURE, among botanists. In describing the parts of plants, Tournefort introduced a geometrical scale, which many of his followers have retained. They measured every part of the plant; and the effence of the description consisted in an accurate mensuration of the whole.

As the parts of plants, however, are liable to variation in so circumstance so much as that of dimension, Linnæus very rarely admits any other mensuration than that arising from the respective length and breadth of the parts compared together. In cases that require actual mensuration, the same author recommends, in lieu of Tournefort's artificial scale, the following natural scale of the human body, which he thinks is much more convenient, and equally accurate.

The scale in question consists of 11 degrees, which are as follows: 1. A hair's-breadth, or the diameter of a hair, (*capillus*). 2. A line, (*linea*), the breadth of the crescent or white appearance at the root of the finger, (not thumb), measured from the skin towards the body of the nail; a line is equal to 12 hair-breadths, and is the 12th part of a Parisian inch. 3. A nail, (*unguis*), the length of a finger-nail; equal to six lines, or half a Parisian inch. 4. A thumb, (*pollex*), the length of the first or outermost joint of the thumb; equal to a Parisian inch. 5. A palmus, (*palmus*), the breadth of the palm, exclusive of the thumb; equal to three Parisian inches. 6. A span, (*pitama*), the distance between the extremity of the thumb and that of the first finger when extended; equal to seven Parisian inches. 7. A great span, (*odrans*), the distance between the extremity of the thumb, and that of the little finger, when extended; equal to nine inches. 8. A foot, (*pes*), measuring from the elbow to the basis of the thumb; equal to 12 Parisian inches. 9. A cubit, (*cubitus*), from the elbow to the extremity of the middle finger; equal to 17 inches. 10. An arm-length, (*brachium*), from the arm-pit to the extremity of the middle-finger; equal to 24 Parisian inches, or two feet. 11. A fathom, (*orgya*), the measure of the human stature; the distance between the extremities of the two middle fingers, when the arms are extended; equal, where greatest, to six feet.

MEASURE, or Bar, in music. See TIME.

MEAT. See FOOD, DIET, DRINK, &c.

*Method of Preserving Flesh-Meat without Spices, and with very little Salt.* Jones, in his *Miscellaneous Curiosities*, gives us the following description of the Moorish *Élcholle*, which is made of beef, mutton, or camel's flesh, but chiefly beef, and which they cut all in long slices, and let it lie for 24 hours in a pickle. They then remove it out of those jars or tubs into others with water; and when it has lain a night, they take it out, and put it on ropes in the sun and air to dry. When it is thoroughly dried and hard, they cut it into pieces of two or three inches long, and throw it into a pan or caldron, which is ready with boiling oil and fuel sufficient to hold it, where it boils till it be very clear and red when cut. After this they take it out, and set it to drain; and when all is thus done it stands to cool, and jars are prepared to put it

up in, pouring upon it the liquor in which it was fried; and as soon as it is thoroughly cold, they stop it up close. It will keep two years; will be hard, and the hardest they look upon to be the best done. This they dish up cold, sometimes fried with eggs and garlic, sometimes stewed, and lemon squeezed on it. It is very good any way, either hot or cold.

EAST MEATH, a county of Ireland, bounded on the east by the ocean and the county of Dublin, on the west by West-Meath, on the south-west by Kildare, and on the north and north-east by Cavan and Louth. It is 32 miles long and 25 broad; contains 18 baronies; and sends to parliament, besides two knights of the shire, 12 members for the boroughs of Trim, Aboy, Navan, Kells, Duleek, and Ratoath. This country abounds in corn, pasture, and herds of cattle; the air and soil being good, and the inhabitants numerous. Several noble families have also titles of honour within it. Horns, prodigiously large, supposed to be those of the moose-deer, have been found not only in this country, but in several other parts of Ireland. Trim is the county-town.

WEST MEATH, a county of Ireland, so named from its situation with regard to the former, by which it is bounded on the east; the Shannon parts it from Roscommon on the west; the king's county lies on the south of it, and Longford on the north. It is between 30 and 40 miles in length, and 20 in breadth; containing many rivers, lakes, and bogs. The land, where it is free from these, is abundantly fertile, and well inhabited. The baronies in this county are 13, and the members sent to parliament 10; viz. two for the shire, and two for each of the boroughs, Mullingar, Athlone, Fore, and Kilsbeggan. Mullingar, by act of parliament, is the county-town.

MEATUS AUDITORIUS. See ANATOMY, n° 403, b.

MEAUX, an ancient town of France, in Brie, with a bishop's see, seated in a place abounding in corn and cattle, on the river Marne, which divides it into two parts, and its trade consists in corn, wool, and cheese. E. Long. 2. 58. N. Lat. 48. 58.

MECCA, an ancient and very famous town of Asia, in Arabia the Happy; seated on a barren spot, in a valley surrounded with little hills, about a day's journey from the Red Sea. It is a place of no strength, having neither walls nor gates, and the buildings are very mean. That which supports it is the resort of a great many thousand pilgrims annually, for the shops are scarcely open all the year besides. The inhabitants are poor, very thin, lean, and swarthy. The hills about the town are very numerous, and all consist of a blackish rock, and some of them are half a mile in circumference. On the top of one of them is a cave, where they pretend Mahomet usually retired to perform his devotions, and hither they affirm the greatest part of the Alcoran was brought him by the angel Gabriel. The town has plenty of water, and yet little garden-stuff; but there are several sorts of good fruits to be had, such as grapes, melons, water-melons, and cucumbers. There are also plenty of sheep brought thither to be sold to the pilgrims. It stands in a very hot climate; and the inhabitants usually sleep on the tops of their houses, for the sake of coolness. The temple of Mecca has 42 doors, and its form resembles the



Mecca.

royal exchange in London, but is near ten times as large. It is open in the middle, and the ground covered with gravel, except in two or three places that lead to the Beat-Allah through certain doors, and these are paved with short stones. There are cloisters all round, and in the sides are little rooms or cells for those that live a monastic life. The Beat-Allah stands in the middle of the temple, and is a square structure, each side about 20 paces long and 24 feet high; covered all over from top to bottom with a thick sort of silk, and the middle embroidered with letters of gold, each letter being about two feet in length, and two inches broad. The door is covered with silver plate, and there is a curtain before it thick with gold embroidery. This Beat is the principal object of the pilgrims devotion, and is open but two days in the space of six weeks; namely, one day for the men, and the next for the women. Within there is only two wooden pillars in the middle to support the roof, with a bar of iron fastened thereto, on which hang three or four silver lamps. The walls on the inside are marble, and covered with silk, unless when the pilgrims enter. About 12 paces from the Beat is the sepulchre of Abraham, as they pretend, and they affirm that he erected the Beat Allah. The tomb is handsome enough, and not unlike those of people of fashion in England. When they have performed their devotions here, they repair to a gibel or hill, which however is not large enough to contain them all at once, for there are no less than 70,000 pilgrims every year. When certain ceremonies are over, they then receive the title of *hadjies* or *saints*, and the next morning they move to a place where they say Abraham went to offer up his son Isaac, which is about two or three miles from Mecca; here they pitch their tents, and then throw seven small stones against a little square stone building. This, as they affirm, is performed in defiance of the devil. Every one then purchases a sheep, which is brought for that purpose, eating some of it themselves, and giving the rest to the poor people who attend upon that occasion. Indeed these are miserable objects, and such starved creatures, that they seem ready to devour each other. After all, one would imagine that this was a very sanctified place; and yet

a renegado who went in pilgrimage thither, affirms there is as much debauchery practised here as in any part of the Turkish dominions. It is 25 miles from Jodda, the sea-port town of Mecca, and 220 south-east of Medina. E. Long. 40. 55. N. Lat. 21. 45.

MECHANICAL, an epithet applied to whatever relates to mechanics: thus we say, mechanical powers, causes, &c. See the articles POWER, CAUSE, &c.

The mechanical philosophy is the fame with what is otherwise called *corpyscular philosophy*. See CORPUSCULAR.

This manner of reasoning is much used in medicine; and, according to Dr Quincy, is the result of a thorough acquaintance with the structure of animal bodies: for considering an animal body as a composition out of the same matter from which all other bodies are formed, and to have all those properties which concern a physician's regard, only by virtue of its peculiar construction; it naturally leads a person to consider the several parts, according to their figures, contexture, and use, either as wheels, pulleys, wedges, levers, screws, cords, canals, strainers, &c. For which purpose, continues he, it is frequently found helpful to design in diagrams, whatsoever of that kind is under consideration, as is customary in geometrical demonstrations.

For the application of this doctrine to the human body, see the article MEDICINE.

MECHANICAL, in mathematics, denotes a construction of some problem, by the assistance of instruments, as the duplicate of the cube and quadrature of the circle, in contradistinction to that which is done in an accurate and geometrical manner.

MECHANICAL CURVE, is a curve, according to Descartes, which cannot be defined by any algebraic equation; and so stands contradistinguished from algebraic or geometrical curves.

Leibnitz and others call these mechanical curves *transcendental*; and dissent from Descartes, in excluding them out of geometry. Leibnitz found a new kind of transcendental equations, whereby these curves are defined: but they do not continue constantly the same in all points of the curve, as algebraic ones do. See the article TRANSCENDENTAL.

## M E C H A N I C S.

<sup>1</sup>  
Definition.

THIS term, in the common acceptation, implies no more than the nature of what is called the *mechanical powers*, together with the combination of these powers in the construction of machines. But as the general properties of matter and central forces are necessary in order to a thorough knowledge of mechanics, we have joined all these subjects together under the general name of *Mechanics*.

### CHAP. I. Of Matter and its Properties.

<sup>2</sup>  
Matter,  
what.

By the word *matter* is here meant every thing that has length, breadth, and thickness, and resists the touch.

<sup>3</sup>  
Its properties.

The inherent properties of matter are solidity, inactivity, mobility, and divisibility.

<sup>4</sup>  
Solidity.

The *solidity* of matter arises from its having length, breadth, thickness; and hence it is, that all bodies are comprehended under some shape or other, and that

every particular body hinders all others from occupying the same part of space which it possesseth. Thus, if a piece of wood or metal be squeezed ever so hard between two plates, they cannot be brought into contact. And even water or air has this property; for if a small quantity of it be fixed between any other bodies, they cannot be brought to touch one another. Dr Priestley and some others have indeed denied this property to matter; and supposed, that, if a sufficient degree of force was applied to two bodies, they might actually exist in the same place at the same moment: but such abstruse speculations cannot be of any service in mechanics, the very foundation of which is built on the opposite principle, and necessarily implies the impenetrability or solidity of matter.

A second property of matter is *inactivity*, or *passiveness*; by which it always endeavours to continue in the state that it is in, whether of rest or motion. And there-

therefore, if one body contains twice or thrice as much matter as another body does, it will have twice or thrice as much inactivity; that is, it will require twice or thrice as much force to give it an equal degree of motion, or to stop it after it hath been put into such a motion. A great deal of this inactivity, however, we are assured, arises from gravity; for in those cases wherein gravity is not opposed, a very small body will set a very large one in motion.

But that matter can never put itself into motion is allowed by all men. For they see that a stone, lying on the plain surface of the earth, never removes itself from that place, nor does any one imagine it ever can. But most people are apt to believe that all matter has a propensity to fall from a state of motion into a state of rest; because they see, that if a stone or a cannon-ball be put into ever so violent a motion, it soon stops: not considering that this stoppage is caused, 1. By the gravity or weight of the body, which sinks it to the ground in spite of the impulse; and, 2. By the resistance of the air thro' which it moves, and by which velocity it is retarded every moment till it falls.

A bowl moves but a short way upon a bowling-green; because the roughness and unevenness of the grassy surface soon creates friction enough to stop it. But if the green were perfectly level, and covered with polished glass, and the bowl were perfectly hard, round, and smooth, it would go a great way farther, as it would have nothing but the air to resist it: if then the air were taken away, the bowl would go on without any friction, and consequently without any diminution of the velocity it had at setting out; and therefore, if the green were extended quite around the earth, the bowl would go on, round and round the earth, for ever.

If the bowl were carried several miles above the earth, and there projected in a horizontal direction, with such a velocity as would make it move more than a semidiameter of the earth in the time it would take to fall to the earth by gravity; in that case, and if there were no resisting medium in the way, the bowl would not fall to the earth at all; but would continue to circulate round it, keeping always in the same tract, and returning to the same point from which it was projected, with the same velocity as at first. In this manner the moon moves round the earth, altho' she is as unactive and dead as any stone upon it.

The third property of matter is *mobility*; for we find that all matter is capable of being moved, if a sufficient degree of force be applied to overcome its inactivity or resistance, or the force of gravity which acts upon all terrestrial bodies.

The fourth property of matter is *divisibility*, of which there can be no end. For, since matter can never be annihilated by cutting or breaking, we can never imagine it to be cut into such small particles, but that if one of them is laid on a table, the uppermost side of it will be further from the table than the undermost side. Moreover, it would be absurd to say that the greatest mountain on earth has more halves, quarters, or tenth parts, than the smallest particle of matter has.

We have many surprising instances of the smallness to which matter can be divided by art: of which the two following are very remarkable.

1. If a pound of silver be fused with a single grain

of gold, the gold will be equally diffused thro' the whole silver; so that taking one grain from any part of the mass (in which there can be no more than the 5760th part of a grain of gold) and dissolving it in *aqua fortis*, the gold will fall to the bottom.

2. The gold-beaters can extend a grain of gold into a leaf containing 50 square inches; and this leaf may be divided into 500000 parts. For an inch in length can be divided into 100 parts, every one of which will be visible to the bare eye: consequently a square inch can be divided into 10000 parts, and 50 square inches into 500000. And if one of these parts be viewed with a microscope that magnifies the diameter of an object only 10 times, it will magnify the area 100 times; and then the 100th part of a 500000th part of a grain (that is, the 50 millionth part) will be visible. Such leaves are commonly used in gilding; and they are so very thin, that if 124500 of them were laid upon one another, and pressed together, they would not exceed one inch in thickness.

Yet all this is nothing in comparison of the lengths that nature goes in the division of matter. For Mr Leewenhoeck tells us, that there are more animals in the milt of a single cod fish, than there are men upon the whole earth: and that, by comparing these animals in a microscope with grains of common sand, it appeared that one single grain is bigger than four millions of them. Now each animal must have a heart, arteries, veins, muscles, and nerves, otherwise they could neither live nor move. How inconceivably small then must the particles of their blood be, to circulate through the smallest ramifications and joinings of their arteries and veins! It has been found by calculation, that a particle of their blood must be as much smaller than a globe of the tenth part of an inch in diameter, as that globe is smaller than the whole earth; and yet, if these particles be compared with the particles of light, they will be found to exceed them as much in bulk as mountains do single grains of sand. For, the force of any body striking against an obstacle is directly in proportion to its quantity of matter multiplied into its velocity: and since the velocity of the particles of light is demonstrated to be at least a million times greater than the velocity of a cannon-ball, it is plain, that if a million of these particles were as big as a single grain of sand, we durst no more open our eyes to the light, than we durst expose them to sand shot point-blank from a cannon.

That matter is infinitely divisible, in a mathematical sense, is easy to be demonstrated. For let AB be the length of a particle to be divided; and let it be touched at opposite ends by the parallel lines CD and EF, which suppose to be infinitely extended beyond D and F. Set off the equal divisions BG, GH, HI, &c. on the line EF, towards the right-hand from B; and take a point, as at R, any where toward the left-hand from A, in the line CD: Then, from this point ved. draw the right lines RG, RH, RI, &c. each of which will cut off a part from the particle AB. But after any finite number of such lines are drawn, there will still remain a part, as AP, at the top of the particle, which can never be cut off: because the lines DR and EF being parallel, no line can ever be drawn from the point R to any point of the line EF that will coincide with the line RD. Therefore the particle AB contains more than any finite number of parts.

<sup>9</sup>  
Attraction.

A fifth property of matter is *attraction*, which seems rather to be infused than inherent. Of this there are four kinds, viz. *cohesion*, *gravitation*, *magnetism*, and *electricity*.

<sup>10</sup>  
Cohesion.

The *attraction of cohesion* is that by which the small parts of matter are made to stick and cohere together. Of this we have several instances, some of which follow.

1. If a small glass tube, open at both ends, is dipt in water, the water will rise up in the tube to a considerable height above its level in the basin: which must be owing to the attraction of a ring of particles of the glass all around in the tube, immediately above those to which the water at any instant rises. And when it has risen so high, that the weight of the column balances the attraction of the tube, it rises no higher. This can be noways owing to the pressure of the air upon the water in the basin; for, as the tube is open at top, it is full of air above the water, which will press as much upon the water in the tube as the neighbouring air does upon any column of an equal diameter in the basin. Besides, if the same experiment be made in an exhausted receiver of the air-pump, there will be found no difference.

2. A piece of loaf-sugar will draw up a fluid, and a sponge will suck in water: and on the same principle sap ascends in trees.

3. If two drops of quicksilver are placed near each other, they will run together and become one large drop.

4. If two pieces of lead be scraped clean, and pressed together with a twist, they will attract each other so strongly, as to require a force much greater than their own weight to separate them. And this cannot be owing to the pressure of the air, for the same thing will hold in an exhausted receiver.

5. If two polished plates of marble or brass be put together, with a little oil between them to fill up the pores in their surfaces and prevent the lodgment of any air; they will cohere so strongly, even if suspended in an exhausted receiver, that the weight of the lower plate will not be able to separate it from the upper one. In putting these plates together, the one should be rubbed upon the other, as a joiner does two pieces of wood when he glues them.

6. If two pieces of cork, equal in weight, are put near each other in a basin of water, they will move equally fast toward each other with an accelerated motion, until they meet: and then, if either of them is moved, it will draw the other after it. If two corks of unequal weights are placed near each other, they will approach with accelerated velocities inversely proportionate to their weights: that is, the lighter cork will move as much faster than the heavier, as the heavier exceeds the lighter in weight. This shews, that the attraction of each cork is in direct proportion to its weight or quantity of matter.

This kind of attraction reaches but to a very small distance; for if two drops of quicksilver are rolled in dust, they will not run together, because the particles of dust keep them out of the sphere of each other's attraction.

<sup>11</sup>  
Repulsion.

When the sphere of attraction ends, a *repulsive force* begins: thus, water repels most bodies till they are wet; and hence it is that a small needle, if dry, swims

upon water; and flies walk upon it without wetting their feet.

The repelling force of the particles of a fluid is but small; and therefore, a fluid when divided easily unites again. But if glass, or any other hard substance, is broke into small parts, they cannot be made to stick together again without being first wetted: the repulsion being too great to admit of a re-union.

The repelling force between water and oil is so great, that we find it almost impossible to mix them in such a manner as not to separate again. If a ball of light wood is dipt in oil, and then put into water, the water will recede so as to form a channel of some depth all around the ball.

The repulsive force of the particles of air is so great, that they can never be brought so near together by condensation as to make them stick or cohere. Hence it is, that when the weight of the incumbent atmosphere is taken off from any small quantity of air, that quantity will diffuse itself in such a manner as to occupy (in comparison) an infinitely greater portion of space than it did before.

<sup>12</sup>  
*Attraction of gravitation* is that power by which distant bodies tend towards one another. Of this we have daily instances in the falling of bodies to the earth. By this power in the earth it is, that bodies, on whatever side, fall in lines perpendicular to its surface; and consequently, on opposite sides, they fall in opposite directions, towards the centre: and by this power it is, that bodies on the earth's surface are kept to it on all sides, so that they cannot fall from it. And as it acts upon all bodies in proportion to their respective quantities of matter, without any regard to their bulks or figures, it accordingly constitutes their weight.

As the attraction of any large body, this earth, for instance, consists of the united attractions of all its parts, it thence follows, that if a body descends from the surface towards the centre of the earth, it would continually become lighter and lighter, the parts above attracting it, as well as those below; in which case it is demonstrated by mathematicians, that the gravity would decrease in the same proportion with the distance from the centre. Thus, let there be a body, <sup>Plate</sup> as P, placed any where within a concave sphere as <sup>CLXVII.</sup> AB; and let us suppose it divided into an infinite <sup>Fig. 11.</sup> number of thin concentric surfaces; the body P will be attracted equally each way by any one of these; for instance, the interior circle HIKLM. Let there be lines, as ILHK, &c. drawn through any point of the body P, in such a manner as to form the surface of two similar figures, suppose cones; the diameters of whose bases may be IH, KL, which let us suppose infinitely small. These bases being as the squares of the lines IH, KL, (2 *El.* 12.) will be directly as the squares of their distances from P; for the triangles IPH, KPL, being infinitely small, are similar. But those bases include all the particles of matter in the interior surface that are opposite to each other: the opposite attractions are therefore in the same ratio with those bases; that is, as the squares of the distances KP, PI. But the attraction is inversely as the squares of the distances of the attracting bodies; that is, inversely as the squares of the same distances PK, PI: these two ratios therefore destroying each other,



other, it is evident, that if the concavity of the sphere was filled with matter, that alone which lies nearer the centre than the body can affect it; the respective actions of all the parts that are more distant being equal, and in contrary directions; since the same is demonstrable of any of the remaining concentric surfaces. Let us see then what effect that which lies nearer the centre than the body will have upon it, which may be considered as a sphere on whose surface the body is placed. The distances of each particle of matter from the body, (taken collectively,) will be as the diameter of the sphere, or as the radius, i. e. as the distance of the body from the centre: their action therefore upon the body will be inversely as the square of that distance; but the quantity of matter will be as the cube of that distance, (18 *El.* 12.): the attraction therefore will be inversely as that proportion. Now, these two ratios being compounded, the attraction will be only as the distance from the centre.

If two bodies which contain equal quantities of matter, were placed at ever so great a distance from one another, and then left at liberty in free space; if there were no other bodies in the universe to affect them, they would fall equally swift towards one another by the power of gravity, with velocities accelerated as they approached each other; and would meet in a point which was half way between them at first. Or, if two bodies containing unequal quantities of matter were placed at any distance, and left in the same manner at liberty, they would fall towards one another with velocities which would be in an inverse proportion to their respective quantities of matter; and moving faster and faster in their mutual approach, would at last meet in a point as much nearer to the place from which the heavier body began to fall, than to the place from which the lighter body began to fall, as the quantity of matter in the former exceeded that in the latter.

All bodies that we know of have gravity or weight. For, that there is no such thing as positive levity, even in smoke, vapours, and fumes, is demonstrable by experiments on the air-pump; which shews, that altho' the smoke of a candle ascends to the top of a tall receiver when full of air, yet, upon the air's being exhausted out of the receiver, the smoke falls down to the bottom of it. So, if a piece of wood is immersed in a jar of water, the wood will rise to the top of the water, because it has a less degree of weight than its bulk of water has: but if the jar is emptied of water, the wood falls to the bottom.

As every particle of matter has its proper gravity, the effect of the whole must be in proportion to the number of the attracting particles; that is, as the quantity of matter in the whole body. This is demonstrable by experiments on pendulums; for, if they are of equal lengths, whatever their weights be, they vibrate in equal times. Now it is plain, that if one be double or triple the weight of another, it must require a double or triple power of gravity to make it move with the same celerity: just as it would require a double or triple force to project a bullet of 20 or 30 pounds weight with the same degree of swiftness that a bullet of 10 pounds would require. Hence it is evident, that the power or force of gravity is always proportional to the quantity of matter in bodies, what-

ever their bulks or figures are.  
Gravity also, like all other virtues or emanations which proceed or issue from a centre, decreases as the distance multiplied by itself increases: that is, a body of distance twice the distance of another attracts with only a fourth part of the force; at thrice the distance, with a ninth part; at four times the distance, with a sixteenth part; and so on. This too is confirmed by comparing the distance which the moon falls in a minute from a right line touching her orbit, with the distance thro' which heavy bodies near the earth fall in that time; and also by comparing the forces which retain Jupiter's moons in their orbits, with their respective distances from Jupiter.

The velocity which bodies near the earth acquire in descending freely by the force of gravity, is proportional to the times of their descent. For, as the power of gravity does not consist in a single impulse, but is always operating in a constant and uniform manner, it must produce equal effects in equal times; and consequently in a double or triple time, a double or triple effect. And so, by acting uniformly on the body, must accelerate its motion proportionably to the time of its descent.

To be a little more particular on this subject, let us suppose that a body begins to move with a celerity constantly and gradually increasing in such a manner as would carry it through a mile in a minute; at the end of this space it will have acquired such a degree of celerity as is sufficient to carry it two miles the next minute, though it should then receive no new impulse from the cause by which its motion had been accelerated; but if the same accelerating cause continues, it will carry the body a mile farther; on which account it will have run through four miles at the end of two minutes; and then it will have acquired such a degree of celerity as is sufficient to carry it through a double space in as much more time, or eight miles in two minutes, even though the accelerating force should act upon it no more. But this force still continuing to operate in an uniform manner, will again, in an equal time, produce an equal effect; and so, by carrying it a mile further, cause it to move through five miles the third minute: for, the celerity already acquired, and the celerity still acquiring, will have each its complete effect. Hence we learn, that if the body should move one mile the first minute, it would move three the second, five the third, seven the fourth, nine the fifth, and so on in proportion.

And thus it appears, that the spaces described, in successive equal parts of time, by an uniformly accelerated motion, are always as the odd numbers 1, 3, 5, 7, 9, &c. and consequently, the whole spaces are as the squares of the times, or of the last acquired velocities. For the continued addition of the odd numbers yields the squares of all numbers from unity upwards. Thus, 1 is the first odd number, and the square of 1 is 1; 3 is the second odd number, and this added to 1 makes 4, the square of 2; 5 is the third odd number, which added to 4 makes 9, the square of 3; and so on for ever. Since, therefore, the times and velocities proceed evenly and constantly, as 1, 2, 3, 4, &c. but the spaces described in each equal time are as 1, 3, 5, 7, &c. it is evident that the space described

Gravity demonstrated to be as the quantity of matter in bodies.

It decreases as the square of the distance increases.

In 1 minute will be  $1+1=2$  = square of 1  
 In 2 minutes  $1+3=4$  = square of 2  
 In 3 minutes  $1+3+5=9$  = square of 3  
 In 4 minutes  $1+3+5+7=16$  = square of 4, &c.

15  
 The descending velocity will give a power of equal ascent.

Of this proposition Mr Rowning gives a mathematical demonstration from the following theorem, viz. That the space passed over by a body with an uniform motion, is in a ratio compounded of the time and velocity. For the longer a body continues to move uniformly, the more space it passes over; and the faster it moves during any interval of time, the farther it goes: therefore the space is in a ratio compounded of both; that is, it is had by multiplying the one into the other.

Hence may be deduced the following corollary, namely, That the area of a rectangle, one of whose sides represents the celerity with which a body moves, and the other the time of its motion, will express the space it moves through.

Plate CLXVII.  
 fig. 2.

Takes up the line AB represent the time a body takes up in falling, and let BC express the celerity acquired by its fall: farther, let the line AB be divided into an indefinite number of small portions, *ei, im, mp*, and let *ef, ik, mn, pq*, &c. be drawn parallel to the base. Now, as the height from which bodies can be let fall is so small, in proportion to their distance from the centre of the earth, that it cannot sensibly alter their gravity, which therefore may be conceived as acting constantly and uniformly upon them during the whole time of their fall; it follows, that they must acquire at every instant an equal degree of velocity. Hence, the velocities being as the times in which they are acquired, it is plain, that the lines *ef, ik, mn, pq*, &c. being to each other (4 El. 6.) as the lines *Ae, Ai, Am, Ap*, &c. will represent the celerities in the times represented by these: that is, *ef* will be as the velocity of the body in the small portion of time *ei*, and *ik* will be as the velocity in the portion of time *im*; in like manner *pq* will be as the velocity in the portion of time *po*; which portions of time being taken infinitely small, the velocity of the body may be supposed the same during any whole portion; and consequently the space run over in the time *ei*, with the velocity *ef*, may be represented by the rectangle *efi*. In like manner the space run over in the time *im*, with the celerity *ik*, may be represented by the rectangle *imk*; and that run over with the celerity *mn*, in the time *mp*, by the rectangle *mpn*; and so of the rest. Therefore the space run over in all those times will be represented by the sum of all the rectangles; that is, by the triangle ABC; for those little triangular deficiencies at the end of each rectangle would have vanished, had the lines *ei, im, mp*, &c. been infinitely short, as the times they were supposed to represent. Now, as the space the body describes in the time AB is represented by the triangle ABC, for the same reason the space passed over in the time *Ao* may be represented by the triangle *Aor*; but these triangles being similar, are to each other as the squares of their homologous sides AB, and Ao, (20 El. 6.) that is, the spaces represented by the triangles are to each other as the squares of the times represented by the sides QED.

As heavy bodies are uniformly accelerated by the power of gravity in their descent, it is plain that they must be uniformly retarded by the same power in their

ascent. Therefore, the velocity which a body acquires by falling, is sufficient to carry it up again to the same height from whence it fell; allowance being made for the resistance of the air, or other medium in which the body is moved. Thus the body D in rolling down the inclined plane AB, will acquire such a velocity by the time it arrives at B, as will carry it up the inclined plane BC, almost to C; and would carry it quite up to C, if the body and plane were perfectly smooth, and the air gave no resistance. So, if a pendulum were put into motion in a space quite void of air and all other resistances, and had no friction on the point of suspension, it would move for ever; for the velocity it had acquired in falling through the descending part of the arc, would be still sufficient to carry it equally high in the ascending part thereof.

Plate CLXIX.  
 fig. 2.

The centre of gravity is that point of a body in which the whole force of its gravity or weight is united. Therefore whatever supports that point bears the weight of the whole body; and whilst it is supported the body cannot fall, because all its parts are in a perfect equilibrium about that point.

16  
 The centre of gravity.

An imaginary line drawn from the centre of gravity of any body towards the centre of the earth, is called the line of direction. In this line all heavy bodies descend, if not obstructed.

17  
 line of direction.

Since the whole weight of a body is united in its centre of gravity, as that centre ascends or descends we must look upon the whole body to do so too. But as it is contrary to the nature of heavy bodies to ascend of their own accord, or not to descend when they are permitted; we may be sure that, unless the centre of gravity be supported, the whole body will tumble or fall. Hence it is, that bodies stand upon their bases when the line of direction falls within the base; for in this case the body cannot be made to fall without first raising the centre of gravity higher than it was before. Thus, the inclining body ABCD, whose centre of gravity is E, stands firmly on its base CDIK, because the line of direction EF falls within the base. But if a weight, as ABGH, be laid upon the top of the body, the centre of gravity of the whole body and weight together is raised up to I; and then, as the line of direction ID falls without the base at D, the centre of gravity I is not supported, and the whole body and weight tumble down together.

Fig. 3.

Hence appears the absurdity of people's rising hastily in a coach or boat when it is likely to overlet; for by that means they raise the centre of gravity so far as to endanger throwing it quite out of the base; which, if they do, they overturn the vehicle effectually: whereas, had they clapt down to the bottom, they would have brought the line of direction, and consequently the centre of gravity, farther within the base, and by that means might have saved themselves.

The broader the base is, and the nearer the line of direction is to the middle or centre of it, the more firmly does the body stand. On the contrary, the narrower the base, and the nearer the line of direction is to the side of it, the more easily may the body be overthrown; a less charge of position being sufficient to remove the line of direction out of the base in the

latter

latter case than in the former. And hence it is, that a sphere is so easily rolled upon a horizontal plane; and that it is so difficult, if not impossible, to make things which are sharp pointed to stand upright on the point. From what hath been said, it plainly appears, that if the plane is inclined on which the heavy body is placed, that body will slide down upon the plane whilst the line of direction falls within the base; but it will tumble or roll down when the line falls without the base. Thus, the body A will only slide down the inclined plane CD, whilst the body B rolls down upon it.

When the line of direction falls within the base of our feet, we stand; and most firmly when it is in the middle: but when it is out of that base, we immediately fall. And it is not only pleasing, but even surprising, to reflect upon the various and unthought of methods and postures which we use to retain this position, or to recover it when it is lost. For this purpose we bend our body forward when we rise from a chair, or when we go up stairs: and for this purpose a man leans forward when he carries a burden on his back, and backward when he carries it on his breast; and to the right or left side as he carries it on the opposite side. A thousand more instances might be added.

The quantity of matter in all bodies is in exact proportion to their weight, bulk for bulk. Therefore, heavy bodies are as much more dense or compact than light bodies of the same bulk, as they exceed them in weight.

All bodies are full of pores, or spaces void of matter: and in gold, which is the heaviest of all known bodies, there is perhaps a greater quantity of space than of matter. For the particles of heat and magnetism find an easy passage through the pores of gold; and even water itself has been forced through them. Besides, if we consider how easily the rays of light pass through so solid a body as glass in all manner of directions, we shall find reason to believe that bodies are much more porous than is generally imagined.

All bodies are some way or other affected by heat; and all metallic bodies are expanded in length, breadth, and thickness, thereby.—The proportion of the expansion of several metals, according to the best experiments, is nearly thus: Iron and glass as 3, steel 4, copper  $4\frac{1}{2}$ , brass 5, tin 6, lead  $6\frac{1}{2}$ . An iron rod 3 feet long is about one seventh part of an inch longer in summer than in winter.

The expansion of metals by heat is demonstrated by the following machine called PYROMETER.

AA is a flat piece of mahogany, in which are fixed four brass studs B, C, D, L; and two pins, one at F and the other at H. On the pin F turns the crooked index EI, and upon the pin H the straight index G K, against which a piece of watch-spring R bears gently, and so presses it towards the beginning of the scale MN, over which the point of that index moves. This scale is divided into inches and tenth parts of an inch: the first inch is marked 1000, the second 2000, and so on. A bar of metal O is laid into notches in the top of the studs C and D; one end of the bar bearing against the adjusting screw P,

and the other end against the crooked index EI, at a 20th part of its length from its centre of motion F. —Now it is plain, that however much the bar O lengthens, it will move that part of the index EI against which it bears just as far: but the crooked end of the same index, near H, being 20 times as far from the centre of motion F as the point is against which the bar bears, it will move 20 times as far as the bar lengthens. And as this crooked end bears against the index G K at only a 20th part of the whole length G S from its centre of motion H, the point S will move through 20 times the space that the point of bearing near H does. Hence, as 20 multiplied by 20 produces 400, it is evident that if the bar lengthens but a 400th part of an inch, the point S will move a whole inch on the scale; and as every inch is divided into 10 equal parts, if the bar lengthens but the 10th part of the 400th part of an inch, which is only the 4000th part of an inch, the point S will move the 10th part of an inch, which is very perceptible.

To find how much a bar lengthens by heat, first lay it cold into the notches of the studs, and turn the adjusting screw P until the spring R brings the point S of the index G K to the beginning of the divisions of the scale at M: then, without altering the screw any farther, take off the bar, and rub it with a dry woollen cloth till it feels warm; and then, laying it on where it was, observe how far it pushes the point S upon the scale by means of the crooked index EI, and the point S will show exactly how much the bar has lengthened by the heat of rubbing. As the bar cools, the spring R bearing against the index K G, will cause its point S to move gradually back towards M in the scale: and where the bar is quite cold, the index will rest at M, when it was before the bar was made warm by rubbing. The indexes have small rollers under them at I and K; which, by turning round on the smooth wood as the indexes move, make their motions the easier, by taking off a great part of the friction, which would otherwise be on the pins F and H, and of the points of the indexes themselves on the wood.

Besides the universal properties above-mentioned, there are bodies which have properties peculiar to themselves; such as the loadstone, in which the most remarkable are these: 1. It attracts iron and steel only. 2. It constantly turns one of its sides to the north and another to the south, when suspended by a thread that does not twirl. 3. It communicates all its properties to a piece of steel when rubbed upon it, without losing any itself. See MAGNETISM.

Several bodies, particularly amber, glass, jet, seal, wax, agate, and almost all precious stones, have a peculiar property of attracting and repelling light bodies when heated by rubbing. This is called *electrical attraction*. See ELECTRICITY.

## CHAP. II. Of Central Forces.

We have already mentioned it as a necessary consequence arising from the deadness or inactivity of matter, that all bodies endeavour to continue in the state they are in, whether of rest or motion. If the body A were placed in any part of free space, where nothing

23 Motion or rest equal indifferent to all bodies.

21 Magnetism.

22 Electricity.

either

25 Q

2

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ate  
LXIX.  
4.

18  
bodies  
porous.

19  
The expansion of metals.

20  
The pyrometer.  
Fig. 5.



either draws or impels it any way, it would for ever remain in that part of space, because it could have no tendency of itself to remove any way from thence. If it receives a single impulse any way, as suppose from A towards B, it will go on in that direction; for, of itself it could never swerve from a right line, nor stop its course. When it has gone through the space AB, and met with no resistance, its velocity will be the same at B as it was at A: and this velocity, in as much more time, will carry it through as much more space, from B to C; and so on for ever. Therefore, when we see a body in motion, we conclude that some other substance must have given it that motion; and when we see a body fall from motion to rest, we conclude that some other body or cause stop it.

Plate  
CLXIX.  
fig. 6.

24  
All motion  
naturally  
rectilinear.

As all motion is naturally rectilinear, it appears, that a bullet projected by the hand, or shot from a cannon, would for ever continue to move in the same direction it received at first, if no other power diverted its course. Therefore, when we see a body move in a curve of any kind whatever, we conclude it must be acted upon by two powers at least; one putting it in motion, and another drawing it off from the rectilinear course it would otherwise have continued to move in: and whenever that power, which bent the motion of the body from a straight line into a curve, ceases to act, the body will again move on in a straight line touching that point of the curve in which it was when the action of that power ceased. For example, a pebble moved round in a sling ever so long a time, will fly off the moment it is set at liberty by slipping one end of the sling-cord, and will go on in a line touching the circle it described before; which line would actually be a straight one, if the earth's attraction did not affect the pebble and bring it down to the ground. This shews that the natural tendency of the pebble, when put into motion, is to continue moving in a straight line, although by the force that moves the sling it be made to revolve in a circle.

25  
The effects  
of combin-  
ed forces.

The change of motion produced is in proportion to the force impressed: for the effects of natural causes are always proportionate to the force or power of those causes.

By these laws it is easy to prove, that a body will describe the diagonal of a square or parallelogram by two forces conjoined, in the same time that it would describe either of the sides by one force singly. Thus, suppose the body A to represent a ship at sea; and that it is drove by the wind, in the right line AB, with such a force as would carry it uniformly from A to B in a minute: then, suppose a stream or current of water running in the direction AD, with such a force as would carry the ship through an equal space from A to D in a minute. By these two forces, acting together at right angles to each other, the ship will describe the line AEC in a minute: which line (because the forces are equal and perpendicular to each other) will be the diagonal of an exact square. To confirm this law by an experiment, let there be a wooden square ABCD so contrived, as to have the part BEFC made to draw out or push into the square at pleasure. To this part let the pulley H be joined, so as to turn freely on an axis, which will be at H when the piece is pushed in, and at *b* when it is drawn out. To this

Fig. 7.

Fig. 8.

part let the ends of a straight wire *k* be fixed, so as to move along with it, under the pulley; and let the ball G be made to slide easily on the wire. A thread *m* is fixed to this ball, and goes over the pulley to I; by this thread the ball may be drawn up on the wire, parallel to the side AD, when the part BEFC is pushed as far as it will go into the square. But, if this part be drawn out, it will carry the ball along with it, parallel to the bottom of the square DC. By this means the ball G may either be drawn perpendicularly upward by pulling the thread *m*, or moved horizontally along by pulling out the part BEFC, in equal times, and through equal spaces; each power acting equally and separately upon it. But if, when the ball is at G, the upper end of the thread be tied to the pin I, in the corner A of the fixed square, and the moveable part BEFG be drawn out, the ball will then be acted upon by both the powers together: for it will be drawn up by the thread towards the top of the square, and at the same time carried with its wire *k* towards the right hand BC, moving all the while in the diagonal line L; and will be found at *g* when the sliding part is drawn out as far as it was before; which then will have caused the thread to draw up the ball to the top of the inside of the square, just as high as it was before, when drawn up singly by the thread without moving the sliding part.

If the acting forces are equal, but at oblique angles to each other, so will the sides of the parallelogram be: and the diagonal run through by the moving body will be longer or shorter, according as the obliquity is greater or smaller. Thus, if two equal forces act conjointly upon the body A, one having a tendency to move it through the space AB in the same time that the other has a tendency to move it through an equal space AD; it will describe the diagonal AGC in the same time that either of the single forces would have caused it to describe either of the sides. If one of the forces be greater than the other, then one side of the parallelogram will be so much longer than the other. For, if one force singly would carry the body through the space AE, in the same time that the other would have carried it through the space AD, the joint action of both will carry it in the same time thro' the space AHF, which is the diagonal of the oblique parallelogram ADEF.

If both forces act upon the body in such a manner as to move it uniformly, the diagonal described will be a straight line; but if one of the forces acts in such a manner as to make the body move faster and faster as it goes forward, then the line described will be a curve. And this is the case of all bodies which are projected in rectilinear directions, and at the same time acted upon by the power of gravity; which has a constant tendency to accelerate their motions in the direction wherein it acts.

From the uniform projectile motion of bodies in straight lines, and the universal power of gravity or of the attraction, arises the curvilinear motion of all the heavenly bodies. If the body A be projected along the straight line AFH in open space, where it meets with no resistance, and is not drawn aside by any power, it will go on for ever with the same velocity, and in the same direction. But if, at the same moment the projection

Fig. 9.

26  
The laws  
of the pla-  
netary mo-  
tions.

Fig. 10.

projectile

Fig. 1.



Fig. 2.



Fig. 3.

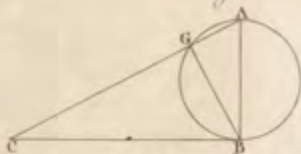


Fig 4.

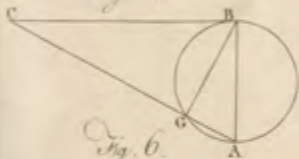


Fig. 3.



Fig. 6.



Fig. 7.



Fig. 8

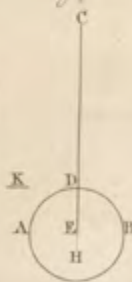


Fig. 9.

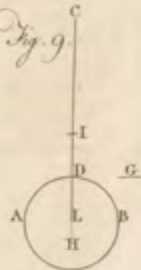


Fig. 10.



Fig. 11.

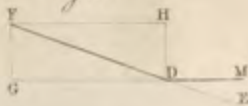
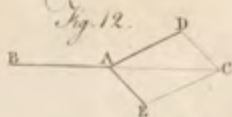


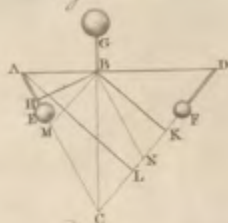
Fig. 12.



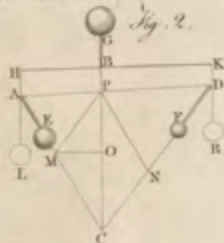




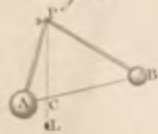
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



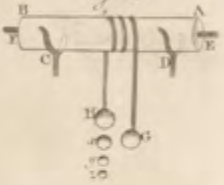
*Fig. 4.*



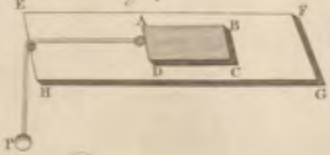
*Fig. 5.*



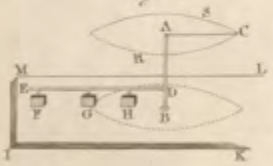
*Fig. 6.*



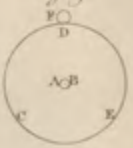
*Fig. 7.*



*Fig. 8.*



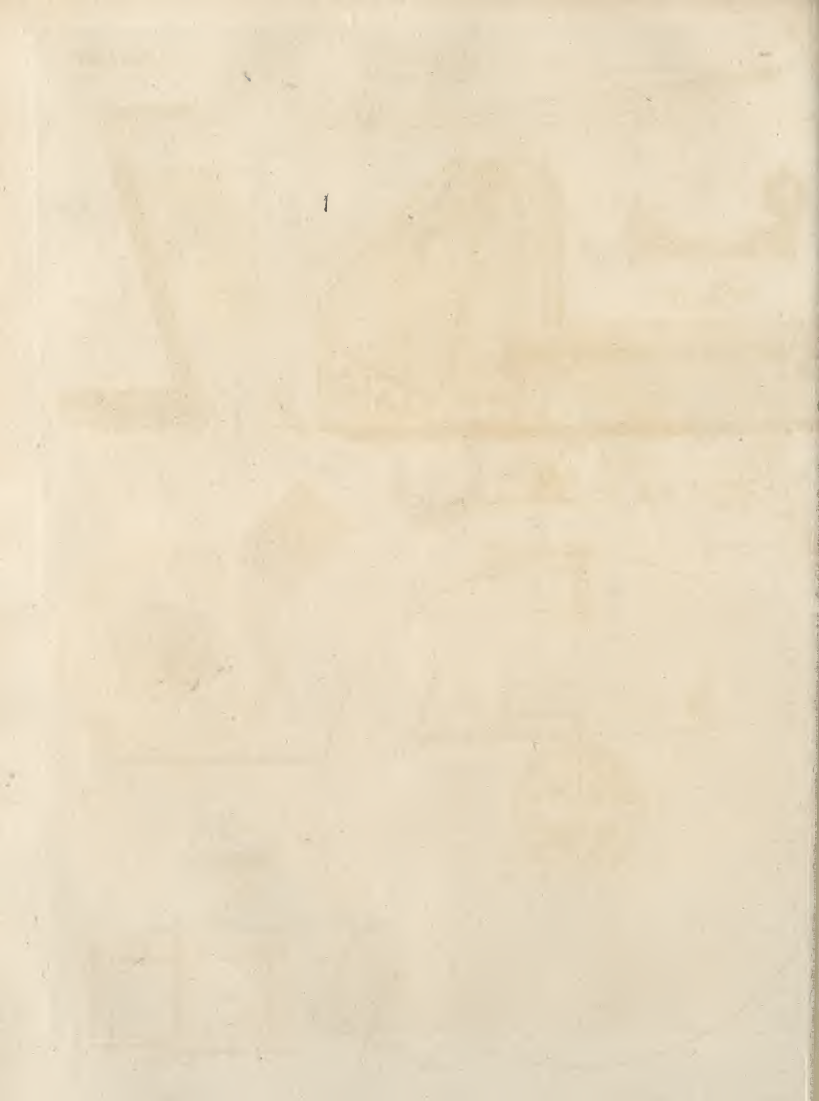
*Fig. 9.*

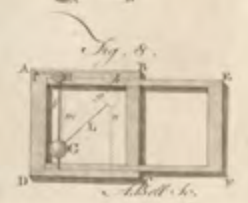
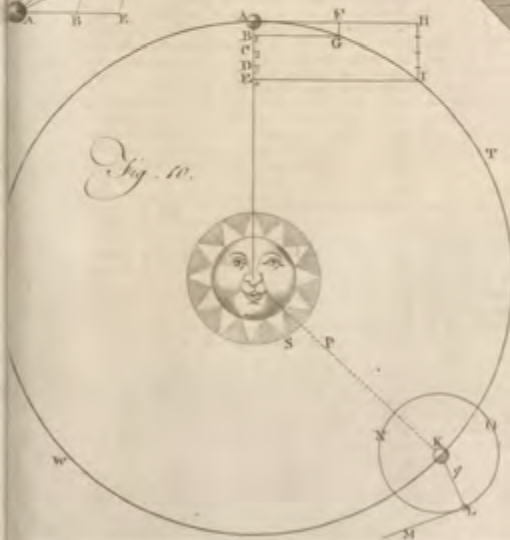
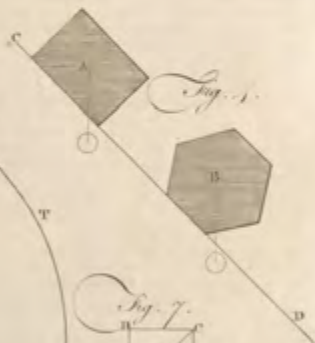
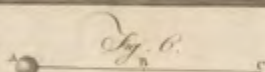
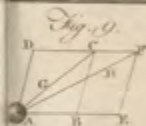
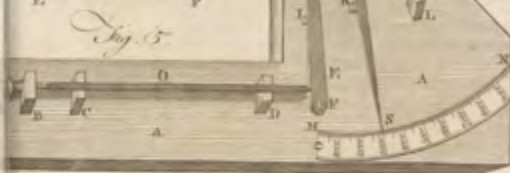
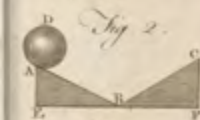
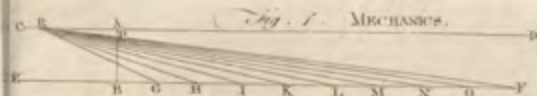


*Fig. 10.*

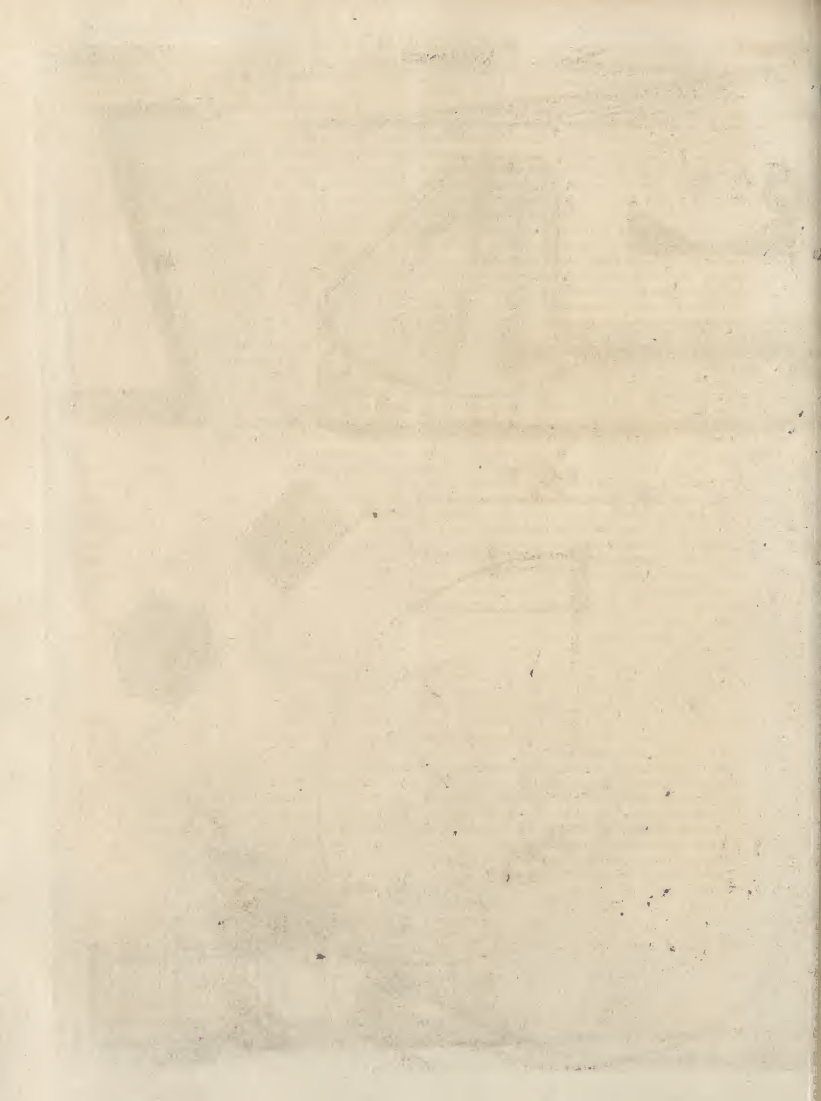


*A Ball's path.*









jectile force is given it at A, the body S begins to attract it with a force duly adjusted (A), and perpendicular to its motion at A, it will then be drawn from the straight line AFH, and forced to revolve about S in the circle ATW; in the same manner, and by the same law, that a pebble is moved round in a sling. And if, when the body is in any part of its orbit (as suppose at K), a smaller body as L, within the sphere of attraction of the body K, be projected in the right line LM, with a force duly adjusted, and perpendicular to the line of attraction LK; then the small body L will revolve about the large body K in the orbit NO, and accompany it in its whole course round the yet larger body S. But then, the body K will no longer move in the circle ATW: for that circle will now be described by the common centre of gravity between K and L; nay, even the greatest body S will not keep in the centre, for it will be the common centre of gravity between all the three bodies S, K, and L, that will remain immovable there. So, if we suppose S and K connected by a wire P that has no weight, and K and L connected by a wire *q* that has no weight, the common centre of gravity of all these three bodies will be a point in the wire P near S; which point being supported, the bodies will be all *in equilibrio* as they move round it: Though indeed, strictly speaking, the common centre of gravity of all the three bodies will not be in the wire P but when these bodies are all in a right line. Here, S may represent the sun, K the earth, and L the moon.

In order to form an idea of the curves described by two bodies revolving about their common centre of gravity, whilst they themselves with a third body are in motion round the common centre of gravity of all the three; let us first suppose E to be the sun, and *e* the earth going round him without any moon; and their moving forces regulated as above. In this case, whilst the earth goes round the sun in the dotted circle RTUWX, &c. the sun will go round the circle ABD, whose centre C is the common centre of gravity between the sun and earth; the right line  $\beta\gamma$  representing the mutual attraction between them, by which they are as firmly connected as if they were fixed at the two ends of an iron bar strong enough to hold them. So, when the earth is at *e*, the sun will be at E; when the earth is at T, the sun will be at F; and when the earth is at *g*, the sun will be at G, &c.

Now, let us take in the moon *g* (at the top of the figure), and suppose the earth to have no progressive motion about the sun; in which case, whilst the moon revolves about the earth in her orbit *aaaa*, the earth will revolve in the circle S 13, whose centre R is the common centre of gravity of the earth and moon; they being connected by the mutual attraction between them in the same manner as the earth and sun are.

But the truth is, that whilst the moon revolves about the earth, the earth is in motion about the sun: and now, the moon will cause the earth to describe an irregular curve, and not a true circle, round the sun; it being the common centre of gravity of the earth and moon that will then describe the same circle

which the earth would have moved in if it had not been attended by a moon. For, supposing the moon to describe a quarter of her progressive orbit about the earth in the time that the earth moves from *e* to *f*; it is plain, that when the earth comes to *f*, the moon will be found at *r*; in which time, their common centre of gravity will have described the dotted arc R 1 T, the earth the curve R *sf*, and the moon the curve *g* 14 *r*. In the time that the moon describes another quarter of her orbit, the centre of gravity of the earth and moon will describe the dotted arc T 2 U, and the earth the curve *f* 6 *g*, and the moon the curve *r* 15 *s*, and so on.—And thus, whilst the moon goes once round the earth in her progressive orbit, their common centre of gravity describes the regular portion of a circle R 1 T 2 U 3 V 4 W, the earth the irregular curve R *sf* 6 *g* 7 *h* 8 *i*, and the moon the yet more irregular curve *g* 14 *r* 15 *s* 16 *t* 17 *u*; and then, the same kind of tracks over again.

The centre of gravity of the earth and moon is 6000 miles from the earth's centre towards the moon; therefore the circle S 13 which the earth describes round that centre of gravity (in every course of the moon round her orbit) is 12,000 miles in diameter. Consequently the earth is 12,000 miles nearer the sun at the time of full moon than at the time of new. See the Earth at *f* and at *h*.

To avoid confusion in so small a figure, we have supposed the moon to go only twice and a half round the earth, in the time that the earth goes once round the sun: it being impossible to take in all the revolutions which she makes in a year, and to give a true figure of her path, unless we should make the semidiameter of the earth's orbit at least 84 inches; and then, the proportional semidiameter of the moon's orbit would be only a quarter of an inch.

If the moon made any complete number of revolutions about the earth in the time that the earth makes one revolution about the sun, the paths of the sun and moon would return into themselves at the end of every year, and so be the same over again: but they return not into themselves in less than 19 years nearly; in which time the earth makes nearly 19 revolutions about the sun, and the moon 235 about the earth.

If the planet A be attracted towards the sun, with such a force as would make it fall from A to B, in the time that the projectile impulse would have carried it from A to F, it will describe the arc AG by the combined action of these forces, in the same time that the former would have caused it to fall from A to B, or the latter have carried it from A to F. But, if the projectile force had been twice as great, that is, such as would have carried the planet from A to H, in the same time that now, by the supposition, it carries it only from A to F; the sun's attraction must then have been four times as strong as formerly, to have kept the planet in the circle A T W; that is, it must have been such as would have caused the planet to fall from A to E, which is four times the distance of A from B, in the time that the projectile force singly would have carried it from A to H, which is only

25 Q 2

twice

(A) To make the projectile force a just balance to the gravitating power, so as to keep the planet moving in a circle, it must give such a velocity as the planet would acquire by gravity when it had fallen through half the semidiameter of that circle.

Plate  
CLXX.  
fig. 1.

27  
The curves  
described  
by bodies  
revolving  
about their  
common  
centre of  
gravity.

Plate  
CLXIX.  
fig. 10.

28  
A double  
projectile  
force balances a  
quadruple  
power of  
gravity.

twice the distance of A from F (a). Thus, a double projectile force will balance a quadruple power of gravity in the same circle; as appears plain by the figure, and shall soon be confirmed by an experiment.

Plate  
CLXX.  
fig. 2.  
29  
The whirling  
table  
described.

The whirling-table is a machine contrived for shewing experiments of this nature. AA is a strong frame of wood, B a winch or handle fixed on the axis C of the wheel D, round which is the catgut string F, which also goes round the small wheels G and K, crossing between them and the great wheel D. On the upper end of the axis of the wheel G, above the frame, is fixed the round board  $d$ , to which the bearer MSX may be fastened occasionally, and removed when it is not wanted. On the axis of the wheel H is fixed the bearer NTZ: and it is easy to see, that when the winch B is turned, the wheels and bearers are put into a whirling motion.

Each bearer has two wires W X, and Y Z, fixed and screwed tight into them at the ends by nuts on the outside. And when these nuts are unscrewed, the wires may be drawn out in order to change the balls U and V, which slide upon the wires by means of brafs loops fixed into the balls, which keep the balls up from touching the wood below them. A strong silk line goes through each ball, and is fixed to it at any length from the centre of the bearer to its end, as occasion requires, by a nut-screw at the top of the ball; the shank of the screw goes into the centre of the ball, and pressing the line against the under side of the hole that it goes through.—The line goes from the ball, and under a small pulley fixed in the middle of the bearer; then up through a socket in the round plate (see S and T) in the middle of each bearer; then through a slit in the middle of the square top (O and P) of each tower, and going over a small pulley on the top comes down again the same way, and is at last fastened to the upper end of the socket fixt in the middle of the above-mentioned round plate. These plates S and T have each four round holes near their edges for letting them slide up and down upon the wires which make the corner of each tower. The balls and plates being thus connected each by its particular line, it is plain that if the balls be drawn outward, or towards the ends M and N of their respective bearers, the round plates S and T will be drawn up to the top of their respective towers O and P.

There are several brafs weights, some of two ounces, some of three, and some of four, to be occasionally put within the towers O and P, upon the round plates S and T: each weight having a round hole in the middle of it, for going upon the sockets or axis of the plates; and is slit from the edge to the hole, for allowing it to be slipped over the foresaid line which comes from each ball to its respective plate.

The experiments to be made by this machine are,

1. Take away the bearer MX, and take the ivory ball  $a$ , to which the line or silk cord  $b$  is fastened at one end; and having made a loop on the other end of the cord, put the loop over a pin fixt in the centre of the board  $d$ . Then, turning the winch B to give the board a whirling motion, you will see that the ball does not immediately begin to move with the

board, but, on account of its inactivity, it endeavours to continue in the state of rest which it was in before.—Continue turning, until the board communicates an equal degree of motion with its own to the ball; and then turning on, you will perceive that the ball will remain upon one part of the board, keeping the same velocity with it, and having no relative motion upon it, as is the case with every thing that lies loose upon the plane surface of the earth, which, having the motion of the earth communicated to it, never endeavours to remove from that place. But stop the board suddenly by the hand, and the ball will go on, and continue to revolve upon the board, until the friction thereof stops its motion: which shews, that matter being once put into motion, would continue to move for ever, if it met with no resistance. In like manner, if a person stands upright in a boat before it begins to move, he can stand firm; but the moment the boat sets off, he is in danger of falling towards that place which the boat departs from: because, as matter, he has no natural propensity to move. But when he acquires the motion of the boat, let it be ever so swift, if it be smooth and uniform, he will stand as upright and firm as if he was on the plain shore; and if the boat strikes against any obstacle, he will fall towards that obstacle; on account of the propensity he has, as matter, to keep the motion which the boat has put him into.

2. Take away this ball, and put a longer cord to it, which may be put down through the hollow axis of the bearer MX, and wheel G, and fix a weight to the end of the cord below the machine; which weight, if left at liberty, will draw the ball from the edge of the whirling-board to its centre.

Draw off the ball a little from the centre, and turn the winch; then the ball will go round and round with the board, and will gradually fly off farther and farther from the centre, and raise up the weight below the machine: which shews that all bodies revolving in circles have a tendency to fly off from these circles, and must have some power acting upon them from the centre of motion, to keep them from flying off. Stop the machine, and the ball will continue to revolve for some time upon the board; but as the friction gradually stops its motion, the weight acting upon it will bring it nearer and nearer to the centre in every revolution, until it brings it quite thither. This shews, that if the planets met with any resistance in going round the sun, its attractive power would bring them nearer and nearer to it in every revolution, until they fell into it.

3. Take hold of the cord below the machine with one hand, and with the other throw the ball upon the round board as it were at right angles to the cord, by which means it will go round and round upon the board. Then observing with what velocity it moves, pull the cord below the machine, which will bring the ball nearer to the centre of the board, and you will see that the nearer the ball is drawn to the centre, the faster it will revolve; as those planets which are nearest the sun revolve faster than those which are more remote; and not only go round sooner, because they describe smaller circles, but even move faster in every part

30  
The propen-  
sity of  
matter to  
keep the  
state it is in.

31  
Bodies mo-  
ving in or-  
bits have a  
tendency to  
fly out of  
these orbits.

32  
Bodies  
move faster  
in small or-  
bits than in  
the large ones.

(a) Here the arcs AG, AI, must be supposed to be very small; otherwise AE, which is equal to HI, will be more than quadruple to AB, which is equal to FG.



33  
Their cen-  
trifugal  
forces  
shewn.

part of their respective circles.

4. Take away this ball, and apply the bearer MX, whose centre of motion is in its middle at  $w$ , directly over the centre of the whirling-board  $d$ . Then put two balls (V and U) of equal weights upon their bearing wires, and having fixed them at equal distances from their respective centres of motion  $w$  and  $x$  upon their silk cords, by the screw-nuts, put equal weights in the towers O and P. Lastly, put the catgut strings E and F upon the grooves G and H of the small wheels; which being of equal diameters, will give equal velocities to the bearers above, when the winch B is turned: and the balls U and V will fly off towards M and N, and will raise the weights in the towers at the same instant. This shews, that when bodies of equal quantities of matter revolve in equal circles with equal velocities, their centrifugal forces are equal.

5. Take away these equal balls, and instead of them put a ball of six ounces into the bearer MX, at a sixth part of the distance  $wz$  from the centre, and put a ball of one ounce into the opposite bearer, at the whole distance  $xy$ , which is equal to  $wz$  from the centre of the bearer; and fix the balls at these distances on their cords, by the screw-nuts at top; and then the ball U, which is six times as heavy as the ball V, will be at only a sixth part of the distance from its centre of motion; and consequently will revolve in a circle of only a sixth part of the circumference of the circle in which V revolves. Now, let any equal weights be put into the towers, and the machine be turned by the winch; which (as the catgut string is on equal wheels below) will cause the balls to revolve in equal times; but V will move six times as fast as U, because it revolves in a circle of six times its radius; and both the weights in the towers will rise at once. This shews, that the centrifugal forces of revolving bodies (or their tendencies to fly off from the circles they describe) are in direct proportion to their quantities of matter multiplied into their respective velocities, or into their distances from the centres of their respective circles. For, supposing U, which weighs six ounces, to be two inches from its centre of motion  $w$ , the weight multiplied by the distance is 12; and supposing V, which weighs only one ounce, to be 12 inches distant from the centre of motion  $x$ , the weight once multiplied by the distance 12 inches is 12. And as they revolve in equal times, their velocities are as their distances from the centre, namely, as 1 to 6.

If these two balls be fixed at equal distances from their respective centres of motion, they will move with equal velocities; and if the tower O has six times as much weight put into it as the tower P has, the balls will raise their weight exactly at the same moment. This shews, that the ball U being six times as heavy as the ball V, has six times as much centrifugal force,

in describing an equal circle with an equal velocity.

9. If bodies of equal weights revolve in equal circles with unequal velocities, their centrifugal forces are as the squares of the velocities. To prove this law by an experiment, let two balls U and V of equal weights be fixed on their cords at equal distances from their respective centres of motion  $w$  and  $x$ ; and then let the catgut string E be put round the wheel K (whose circumference is only one half of the circumference of the wheel H or G) and over the pulley  $s$  to keep it tight; and let four times as much weight be put into the tower P as in the tower O. Then turn the winch B, and the ball V will revolve twice as fast as the ball U in a circle of the same diameter, because they are equidistant from the centres of the circles in which they revolve; and the weights in the towers will both rise at the same instant, which shews that a double velocity in the same circle will exactly balance a quadruple power of attraction in the centre of the circle. For the weights in the towers may be considered as the attractive forces in the centres, acting upon the revolving balls; which, moving in equal circles, is the same thing as if they both moved in one and the same circle.

35  
If bodies of equal weights revolve in unequal circles, in such a manner that the squares of the times of their going round are as the cubes of their distances from the centres of the circles they describe; their centrifugal forces are inversely as the squares of their distances from those centres. For, the catgut string remaining as in the last experiment, let the distance of the ball V from the centre  $x$  be made equal to two of the cross divisions on its bearer; and the distance of the ball U from the centre  $w$  be three and a sixth part; the balls themselves being of equal weights, and V making two revolutions by turning the winch, in the time that U makes one: so that if we suppose the ball V to revolve in one moment, the ball U will revolve in two moments, the squares of which are one and four: for the square of 1 is only 1, and the square of 2 is 4; therefore the square of the period or revolution of the ball V, is contained four times in the square of the period of the ball U. But the distance of V is 2, the cube of which is 8, and the distance of U is  $3\frac{1}{6}$ , the cube of which is 32 very nearly; in which 8 is contained four times; and therefore, the squares of the periods of V and U are to one another as the cubes of their distances from  $x$  and  $w$ , which are the centres of their respective circles. And if the weight in the tower O be four ounces, equal to the square of 2; the distance of V from the centre  $x$ ; and the weight in the tower P be 16 ounces, nearly equal to the square of  $3\frac{1}{6}$ , the distance of U from  $w$ ; it will be found, upon turning the machine by the winch, that the balls U and V will raise their respective weights at very nearly the same instant of time. Which confirms that famous proposition of Kepler (A), viz. that the squares

(A) This law is of infinite use to astronomers; for if they know the periodical time, that is, the time of the circular revolution of two planets, and the distance of one of them from the centre, they can by this find out the distance of the other, which before was not known. For instance, we know the periodical time of the moon to be 27 days, and the periodical time of the earth to be 365 days. The distance of the moon from the centre of its motion we also know to be 60 semi-diameters of the earth. Now we desire to know the distance of the earth from the centre of its motion, namely, the sun? We know by rule, that the proportion of the squares of the periodical times will give the proportion of the cubes of the distances. Then we find out the squares of the periodical times of the two planets. The periodical time of the moon is 27, and the square of that number 729; the periodical time of the earth is 365, and the square 133225. Then we find the distance of the planet, already known, 60, and cube it, which makes

216000.

of the periodical times of the planets round the sun are in proportion to the cubes of their distances from him; and that the sun's attraction is inverſely as the ſquare of the diſtance from his centre: that is, at twice the diſtance, his attraction is four times leſs; and thrice the diſtance, nine times leſs; at four times the diſtance, ſixteen times leſs; and ſo on, to the remotest part of the ſyſtem.

Plate  
CLXX.  
Fig. 4.  
36  
The abſur-  
dity of the  
Carteſian  
vortex.

8. Take off the catgut ſtring E from the great wheel D and the ſmall wheel H, and let the ſtring F remain upon the wheels D and G. Take away alſo the bearer MX from the whirling-board *d*, and inſtead thereof put the machine AB fig. 4. upon it, fixing this machine to the centre of the board by the pins *c* and *d*, in ſuch a manner, that the end *ef* may riſe above the board to an angle of 30 or 40 degrees. In the upper ſide of this machine there are two glaſs tubes *a* and *b*, cloſe ſtopt at both ends; and each tube is about three quarters full of water. In the tube *a* is a little quickſilver, which naturally falls down to the end *a* in the water, becauſe it is heavier than its bulk of water; and on the tube *b* is a ſmall cork which floats on the top of the water at *e*, becauſe it is lighter; and it is ſmall enough to have liberty to riſe or fall in the tube. While the board *b* with this machine upon it continues to reſt, the quickſilver lies at the bottom of the tube *a*, and the cork floats on the water near the top of the tube *b*. But, upon turning the winch, and putting the machine in motion, the contents of each tube will fly off towards the uppermoſt ends (which are fartheſt from the centre of motion) the heavielt with the greateſt force. Therefore the quickſilver in the tube *a* will fly off quite to the end *f*, and occupy its bulk of ſpace there, excluding the water from that place, becauſe it is lighter than quickſilver; but the water in the tube *b* flying off to its higher end *e*, will exclude the cork from that place, and cauſe the cork to deſcend towards the lowermoſt end of the tube, where it will remain upon the loweſt end of the water near *b*; for the heavier body having the greater centrifugal force will therefore poſſeſs the uppermoſt part of the tube, and the lighter body will keep between the heavier and the lowermoſt part.

This demonſtrates the abſurdity of the Carteſian doctrine of the planets moving round the ſun in vortexes: for, if the planet be more denſe or heavy than its bulk of the vortex, it will fly off therein farther and farther from the ſun; if leſs denſe, it will come down to the loweſt part of the vortex, at the ſun; and the whole vortex itſelf muſt be ſurrounded with ſomething like a great wall, otherwiſe it would fly quite off, planets and all together. But while gravity exiſts, there is no occaſion for ſuch vortexes; and when it ceaſes to exiſt, a ſtone thrown upwards will never return to the earth again.

37  
If one body  
moves  
round another,  
both  
of them  
muſt move  
round their  
common  
centre of  
gravity.

9. If a body be ſo placed on the whirling-board of the machine (fig. 2.) that the centre of gravity of the body be directly over the centre of the board, and the board be put into ever ſo rapid a motion by the winch B, the body will turn round with the board, but will not remove from the middle of it; for, as all parts

of the body are in *æquilibrio* round its centre of gravity, and the centre of gravity is at reſt in the centre of motion, the centrifugal force of all parts of the body will be equal at equal diſtances from its centre of motion, and therefore the body will remain in its place. But if the centre of gravity be placed ever ſo little out of the centre of motion, and the machine be turned ſwiftly round, the body will fly off towards that ſide of the board on which its centre of gravity lies. Thus, if the wire C with its ball B be taken away from the demi-globe A, and the flat diſc *ef* of this demi-globe be laid upon the whirling-board of the machine, ſo that their centres may coincide; if then the board be turned ever ſo quick by the winch, the demi-globe will remain where it was placed. But if the wire C be ſcrewed into the demi-globe at *d*, the whole becomes one body, whoſe centre of gravity is now at or near *d*. Let the pin *c* be fixed in the centre of the whirling-board, and the deep groove *b* cut in the flat ſide of the demi-globe be put upon the pin, ſo as the pin may be in the centre of *A*, (ſee fig. 6. where this groove is repreſented at *b*), and let the whirling-board be turned by the winch, which will carry the little ball B with its wire C, and the demi-globe A, all round the centre-pin *c*; and then the centrifugal force of the little ball B, which weighs only one ounce, will be ſo great, as to draw off the demi-globe A, which weighs two pounds, until the end of the groove at *e* ſtrikes againſt the pin *c*, and ſo prevents the demi-globe A from going any farther: otherwiſe, the centrifugal force of B would have been great enough to have carried A quite off the whirling-board. Which ſhews, that if the ſun were placed in the very centre of the orbits of the planets, it could not poſſibly remain there: for the centrifugal forces of the planets would carry them quite off, and the ſun with them; eſpecially when ſeveral of them happened to be in any one quarter of the heavens. For the ſun and planets are as much connected by the mutual attraction that ſubſiſts between them, as the bodies A and B are by the wire C which is fixed into them both. And even if there were but one ſingle planet in the whole heavens to go round ever ſo large a ſun in the centre of its orbit, its centrifugal force would ſoon carry off both itſelf and the ſun. For, the greateſt body placed in any part of free ſpace could be eaſily moved: becauſe if there were no other body to attract it, it could have no weight or gravity of itſelf; and conſequently, tho' it could have no tendency of itſelf to remove from that part of ſpace, yet it might be very eaſily moved by any other ſubſtance. And perhaps it was this conſideration which made the celebrated Archimedes ſay, that if he had a proper place at ſome diſtance from the earth whereon to fix his machinery, he could move the whole earth.

10. As the centrifugal force of the light body B will not allow the heavy body A to remain in the centre of motion, even though it be 24 times as heavy as B; let us now take the ball A (fig. 7.) which weighs 7 fix ounces, and connect it by the wire C with the ball B, which weighs only one ounce; and let the fork E

hang

216000. Now by a rule in arithmetic, we find out a certain number which will bear the ſame proportion to this, that the ſquares 729, and 133225 bear to each other; that proportional number is 39460336, and the cube root of this laſt number, which is 340, will expreſs the diſtance of the ſun from the earth, which was what we wanted to know, ſo that the earth is diſtant from the ſun 3400 of its own ſemi-diameters.

Plate  
CLXX.  
fig. 7.

be fixed into the centre of the whirling-board: then hang the balls upon the fork by the wire C in such a manner, that they may exactly balance each other; which will be when the centre of gravity between them, in the wire at *d*, is supported by the fork. And this centre of gravity is as much nearer to the centre of the ball A, than to the centre of the ball B, as A is heavier than B, allowing for the weight of the wire on each side of the fork. This done, let the machine be put into motion by the winch; and the balls A and B will go round their common centre of gravity *d*, keeping their balance, because either will not allow the other to fly off with it. For, supposing the ball B to be only one ounce in weight, and the ball A to be six ounces; then, if the wire C were equally heavy on each side of the fork, the centre of gravity *d* would be six times as far from the centre of the ball B as from the ball A, and consequently B will revolve with a velocity six times as great as A does; which will give B six times as much centrifugal force as any single ounce of A has: but then, as B is only one ounce, and A six ounces, the whole centrifugal force of A will exactly balance the whole centrifugal force of B: and therefore, each body will detain the other so as to make it keep in its circle. This shews, that the sun and planets must all move round the common centre of gravity of the whole system, in order to preserve that just balance which takes place among them. For, the planets being as unactive and dead as the above balls, they could no more have put themselves into motion than these balls can; nor have kept in their orbits without being balanced at first with the greatest degree of exactness upon their common centre of gravity, by the Almighty hand that made them and put them in motion.

Perhaps it may be here asked, that since the centre of gravity between these balls must be supported by the fork E in this experiment, What prop it is that supports the centre of gravity of the solar system, and consequently bears the weight of all the bodies in it; and by what is the prop itself supported? The answer is easy and plain; for the centre of gravity of our balls must be supported, because they gravitate towards the earth, and would therefore fall to it: but as the sun and planets gravitate only towards one another, they have nothing else to fall to, and therefore have no occasion for any thing to support their common centre of gravity: and if they did not move round that centre, and consequently acquire a tendency to fly off from it by their motions, their mutual attractions would soon bring them together; and so the whole would become one mass in the sun: which would also be the case if their velocities round the sun were not quick enough to create a centrifugal force equal to the sun's attraction.

But after all this nice adjustment, it appears evident that the Deity cannot withdraw his regulating hand from his works, and leave them to be solely governed by the laws which he has impressed upon them at first. For if he should once leave them so, their order would in time come to an end; because the planets must necessarily disturb one another's motions by their mutual attractions, when several of them are in the same quarter of the heavens; as is often the case: and then, as they attract the sun more towards that quarter than when they are in a manner dispersed equally

around him, if he was not at that time made to describe a portion of a larger circle round the common centre of gravity, the balance would then be immediately destroyed; and as it could never restore itself again, the whole system would begin to fall together, and would in time unite in a mass at the sun. Of this disturbance we have a very remarkable instance in the comet which appeared lately; and which, in going last up before from the sun, went so near to Jupiter, and was so affected by his attraction, as to have the figure of its orbit much changed; and not only so, but to have its period altered, and its course to be different in the heavens from what it was last before.

11. Take away the fork and balls from the whirling-board, and place the trough AB thereon, fixing its centre to the centre of the whirling-board by the pin H. In this trough are two balls D and E, of unequal weights, connected by a wire *f*; and made to slide easily upon the wire C, stretched from end to end of the trough, and made fast by nut-screws on the outside of the ends. Let these balls be so placed upon the wire C, that their common centre of gravity *g* may be directly over the centre of the whirling-board. Then, turn the machine by the winch ever so swiftly, and the trough and balls will go round their centre of gravity, so as neither of them will fly off; because on account of the equilibrium, each ball detains the other with an equal force acting against it. But if the ball E be drawn a little more towards the end of the trough at A, it will remove the centre of gravity towards that end from the centre of motion; and then, upon turning the machine, the little ball E will fly off, and strike with a considerable force against the end A, and draw the great ball B into the middle of the trough. Or, if the great ball D be drawn towards the end B of the trough, so that the centre of gravity may be a little towards that end from the centre of motion, and the machine be turned by the winch, the great ball D will fly off, and strike violently against the end B of the trough, and will bring the little ball E into the middle of it. If the trough be not made very strong, the ball D will break through it.

12. The reason why the tides rise at the same absolute time on opposite sides of the earth, and consequently in opposite directions, is made abundantly plain by a new experiment on the whirling-table. The cause of their rising on the side next the moon every one understands to be owing to the moon's attraction: but why they should rise on the opposite side at the same time, where there is no moon to attract them, is perhaps not so generally understood. For it would seem that the moon should rather draw the waters (as it were) closer to that side, than raise them upon it, directly contrary to her attractive force. Let the circle *abcd* represent the earth, with its side *e* turned toward the moon, which will then attract the waters so as to raise them from *c* to *g*. But the question is, Why should they rise as high at that very time on the opposite side, from *a* to *e*? In order to explain this, let there be a plate AB fixed upon one end of the flat bar DC, with such a circle drawn upon it as *abcd* (in fig. 9.) to represent the round figure of the earth and sea; and such an ellipsis as *efgh* to represent the swelling of the tide at *e* and *g*, occasioned by the influence of the moon. Over this plate AB let.



Plate  
CLXXX.  
fig. 10.

let the three ivory balls  $e, f, g$ , be hung by the silk lines  $h, i, k$ , fastened to the tops of the crooked wires  $H, I, K$ , in such a manner, that the ball at  $e$  may hang freely over the side of the circle  $e$ , which is farthest from the moon  $M$  (at the other end of the bar;) the ball at  $f$  may hang freely over the centre, and the ball at  $g$  hang over the side of the circle  $g$ , which is nearest the moon. The ball  $f$  may represent the centre of the earth, the ball  $g$  some water on the side next the moon, and the ball  $e$  some water on the opposite side. On the back of the moon  $M$  is fixed the short bar  $N$  parallel to the horizon, and there are three holes in it above the little weights  $p, q, r$ . A silk thread  $o$  is tied to the line  $k$  close above the ball  $g$ , and passing by one side of the moon  $M$ , goes through a hole in the bar  $N$ , and has the weight  $p$  hung to it. Such another thread  $n$  is tied to the line  $i$ , close above the ball  $f$ , and passing through the centre of the moon  $M$ , and middle of the bar  $N$ , has the weight  $q$  hung to it, which is lighter than the weight  $p$ . A third thread  $m$  is tied to the line  $h$ , close above the ball  $e$ , and passing by the other side of the moon  $M$ , through the bar  $N$ , has the weight  $r$  hung to it, which is lighter than the weight  $q$ .

The use of these three unequal weights is to represent the moon's unequal attraction at different distances from her. With whatever force she attracts the centre of the earth, she attracts the side next her with a greater degree of force, and the side farthest from her with a less. So, if the weights are left at liberty, they will draw all the three balls towards the moon with different degrees of force, and cause them to make the appearance shewn in fig. 11.; by which means they are evidently farther from each other than they would be if they hung at liberty by the lines  $h, i, k$ ; because the lines would then hang perpendicularly. This shews, that as the moon attracts the side of the earth which is nearest her with a greater degree of force than she does the centre of the earth, she will draw the water on that side more than she draws the centre, and so cause it to rise on that side: and as she draws the centre more than she draws the opposite side, the centre will recede farther from the surface of the water to that opposite side, and so leave it as high there as she raised it on the side next to her. For, as the centre will be in the middle between the tops of the opposite elevations, they must of course be equally high on both sides at the same time.

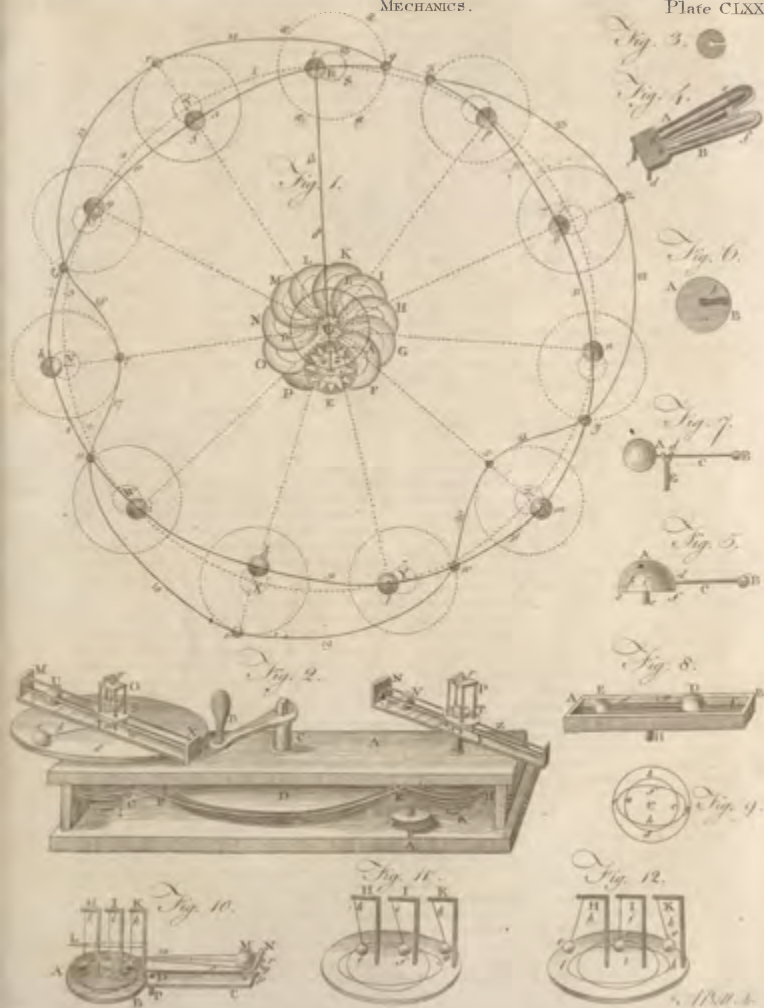
But upon this supposition the earth and moon would soon come together: and to be sure they would, if they had not a motion round their common centre of gravity, to create a degree of centrifugal force sufficient to balance their mutual attraction. This motion they have: for as the moon goes round her orbit every month at the distance of 240,000 miles from the earth's centre, and of 234,000 miles from the centre of gravity of the earth and moon, so does the earth go round the same centre of gravity every month at the distance of 6000 miles from it; that is, from it to the centre of the earth. Now as the earth is (in round numbers) 8000 miles in diameter, it is plain that its side next the moon is only 2000 miles from the common centre of gravity of the earth and moon, its centre 6000 miles distant therefrom, and its farther side from the moon 10,000. There-

fore the centrifugal forces of these parts are as 2000, 6000, and 10,000; that is, the centrifugal force of any side of the earth, when it is turned from the moon, is five times as great as when it is turned towards the moon. And as the moon's attraction (expressed by the number 6000) at the earth's centre keeps the earth from flying out of this monthly circle, it must be greater than the centrifugal force of the waters on the side next her; and consequently, her greater degree of attraction on that side is sufficient to raise them: but as her attraction on the opposite sides is less than the centrifugal force of the water there, the excess of this force is sufficient to raise the water just as high on the opposite side. To prove this experimentally, let the bar  $DC$  with its furniture Fig. 10. be fixed upon the whirling-board of the machine (fig. 2.), by pushing the pin  $P$  into the centre of the board; which pin is in the centre of gravity of the whole bar with its three balls  $e, f, g$ , and moon  $M$ . Now if the whirling-board and bar be turned slowly round by the winch, until the ball  $f$  hangs over the centre of the circle, as in fig. 12. the ball  $g$  will be kept towards the moon by the heaviest weight  $p$  (fig. 10.); and the ball  $e$ , on account of its greater centrifugal force, and the lesser weight  $r$ , will fly off as far to the other side, as in fig. 12. And so, whilst the machine is kept turning, the balls  $e$  and  $g$  will hang over the ends of the ellipsis  $l f k$ . So that the centrifugal force of the ball  $e$  will exceed the moon's attraction just as much as her attraction exceeds the centrifugal force of the ball  $g$ , whilst her attraction just balances the centrifugal force of the ball  $f$ , and makes it keep in its circle. And hence it is evident that the tides must rise to equal heights at the same time on opposite sides of the earth. This experiment was invented by Mr Ferguson.

From the principles thus established, it is evident, that the earth moves round the sun, and not the sun round the earth: for the centrifugal law will never allow a great body to move round a small one in any orbit whatever; especially when we find, that if a small body moves round a great one, the great one must also move round the common centre of gravity between them two. And it is well known, that the quantity of matter in the sun is 227,000 times as great as the quantity of matter in the earth. Now, as the sun's distance from the earth is at least 81,000,000 of miles, if we divide that distance by 227,000, we shall have only 357 for the number of miles that the centre of gravity between the sun and earth is distant from the sun's centre. And as the sun's semidiameter is  $\frac{1}{4}$  of a degree, which, at so great a distance as that of the sun, must be no less than 381,500 miles; if this be divided by 357, the quotient will be 1068 $\frac{2}{3}$ ; which shews that the common centre of gravity is within the body of the sun, and is only the 1068 $\frac{2}{3}$  part of his semidiameter from his centre toward his surface.

All globular bodies, whose parts can yield, and which do not turn on their axes, must be perfect spheres, because all parts of their surfaces are equally attracted toward their centres. But all such globes which do turn on their axes will be oblate spheroids; that is, their surfaces will be higher, or farther from the centre, in the equatorial than in the polar regions.

For,







For, as the equatorial parts move quickest, they must have the greatest centrifugal force; and will therefore recede farthest from the axis of motion. Thus, if two circular hoops AB and CD, made thin and flexible, and crossing one another at right angles, be turned round their axis EF by means of the winch *m*, the wheel *n*, and the pinion *a*, and the axis be loose in the pole or intersection *e*, the middle parts A, B, C, D will swell out so as to strike against the sides of the frame at F and G, if the pole *e*, in sinking to the pin E, be not stopped by it from sinking farther: so that the whole will appear of an oval figure, the equatorial diameter being considerably longer than the polar. That our earth is of this figure, is demonstrable from actual measurement of some degrees on its surface, which are found to be longer in the frigid zones than in the torrid: and the difference is found to be such as proves the earth's equatorial diameter to be 35 miles longer than its axis.—Since then the earth is higher at the equator than at the poles, the sea, which, like all other fluids, naturally runs downwards (or towards the places which are nearest the earth's centre), would run towards the polar regions, and leave the equatorial parts dry, if the centrifugal force of the water, which carried it to those parts, and so raised them, did not detain and keep it from running back again towards the poles of the earth.

CHAP. III. Of the Mechanical Powers.

If we consider bodies in motion, and compare them together, we may do this either with respect to the quantities of matter they contain, or the velocities with which they are moved. The heavier any body is, the greater is the power required either to move it or to stop its motion: and again, the swifter it moves, the greater is its force. So that the whole *momentum* or quantity of force of a moving body is the result of its quantity of matter multiplied by the velocity with which it is moved. And when the products arising from the multiplication of the particular quantities of matter in any two bodies by their respective velocities are equal, the *momenta* or entire forces are so too. Thus, suppose a body, which we shall call A, to weigh 40 pounds, and to move at the rate of two miles in a minute; and another body, which we shall call B, to weigh only four pounds, and to move 20 miles in a minute; the entire forces with which these two bodies would strike against any obstacle would be equal to each other, and therefore it would require equal powers to stop them. For 40 multiplied by 2 gives 80, the force of the body A; and 20 multiplied by 4 gives 80, the force of the body B.

Upon this easy principle depends the whole of mechanics: and it holds universally true, that when two bodies are suspended by any machine, so as to act contrary to each other; if the machine be put into motion, and the perpendicular ascent of one body multiplied into its weight be equal to the perpendicular descent of the other body multiplied into its weight, these bodies, how unequal soever in their weights, will balance one another in all situations: for, as the whole ascent of one is performed in the same time with the whole descent of the other, their respective velocities must be directly as the spaces they move through; and

the excess of weight in one body is compensated by the excess of velocity in the other. Upon this principle it is easy to compute the power of any mechanical engine, whether simple or compound; for it is but only inquiring how much swifter the power moves than the weight does (*i. e.* how much farther in the same time), and just so much is the power increased by the help of the engine.

In the theory of this science, we suppose all planes perfectly even, all bodies perfectly smooth, levers to have no weight, cords to be extremely pliable, machines to have no friction; and in short, all imperfections must be set aside until the theory be established, and then proper allowances are to be made.

The simple machines, usually called *mechanical powers*, are six in number, *viz.* the lever, the wheel and axle, the pulley, the inclined plane, the wedge, and the screw. They are called *mechanical powers*, because they help us to raise weights, move heavy bodies, and overcome resistances, which we could not effect without them.

1. A lever is a bar of iron or wood, one part of which being supported by a prop, all the other parts turn upon that prop as their centre of motion: and the velocity of every part or point is directly as its distance from the prop. Therefore, when the weight to be raised at one end is to the power applied at the other to raise it, as the distance of the power from the prop is to the distance of the weight from the prop, the power and weight will exactly balance or counterpoise each other: and as a common lever has but very little friction on its prop, a very little additional power will be sufficient to raise the weight.

There are four kinds of levers. 1. The common sort, where the prop is placed between the weight and the power; but much nearer to the weight than the power. 2. When the prop is at one end of the lever, the power at the other, and the weight between them. 3. When the prop is at one end, the weight at the other, and the power applied between them. 4. The bended lever, which differs only in form from the first sort, but not in property. Those of the first and second kind are often used in mechanical engines; but there are few instances in which the third sort is used.

A *common balance* is a lever of the first kind; but as both its ends are at equal distances from its centre of motion, they move with equal velocities; and therefore, as it gives no mechanical advantage, it cannot properly be reckoned among the mechanical powers.

A lever of the first kind is represented by the bar ABC, supported by the prop D. Its principal use is to loosen large stones in the ground, or raise great weights to small heights, in order to have ropes put under them for raising them higher by other machines. The parts AB and BC, on different sides of the prop D, are called the *arms* of the lever: the end A of the shorter arm AB being applied to the weight intended to be raised, or to the resistance to be overcome; and the power applied to the end C of the longer arm BC.

In making experiments with this machine, the shorter arm AB must be as much thicker than the longer arm BC, as will be sufficient to balance it on the prop. This supposed, let P represent a power whose intensity is equal to 1 ounce, and W a weight whose intensity is equal to 12 ounces. Then, if the power be

12 times as far from the prop as the weight is, they will exactly counterpoise; and a small addition to the power P will cause it to defend, and raise the weight W; and the velocity with which the power descends will be to the velocity with which the weight rises, as 12 to 1: that is, directly as their distances from the prop; and consequently, as the spaces through which they move. Hence, it is plain, that a man who by his natural strength, without the help of any machine, could support 100 weight, will by the help of this lever be enabled to support 1200. If the weight be less, or the power greater, the prop may be placed so much farther from the weight; and then it can be raised to a proportionably greater height. For universally, if the intensity of the weight multiplied into its distance from the prop be equal to the intensity of the power multiplied into its distance from the prop, the power and weight will exactly balance each other; and a little addition to the power will raise the weight. Thus, in the present instance, the weight W is 12 ounces, and its distance from the prop is 1 inch; and 12 multiplied by 1 is 12; the power P is equal to 1 ounce, and its distance from the prop is 12 inches, which multiplied by 1 is 12 again; and therefore there is an equilibrium between them. So, if a power equal to 2 ounces be applied at the distance of 6 inches from the prop, it will just balance the weight W; for 6 multiplied by 2 is 12, as before. And a power equal to 3 ounces placed at 4 inches distance from the prop would be the same; for 3 times 4 is 12; and so on, in proportion.

<sup>46</sup>  
The steelyard.

The *statera* or Roman *steelyard* is a lever of this kind, contrived for finding the weights of different bodies by one single weight placed at different distances from the prop or centre of motion D. For, if a scale hangs at A, the extremity of the shorter arm AB, and is of such a weight as will exactly counterpoise the longer arm BC; if this arm be divided into as many equal parts as it will contain, each equal to AB, the single weight P (which we may suppose to be 1 pound) will serve for weighing any thing as heavy as itself, or as many times heavier as there are divisions in the arm BC, or any quantity between its own weight and that quantity. As for example, if P be 1 pound, and placed at the first division 1 in the arm BC, it will balance 1 pound in the scale at A: if it be removed to the second division at 2, it will balance 2 pounds in the scale: if to the third, 3 pounds; and so on to the end of the arm BC. If each of these integral divisions be subdivided into as many equal parts as a pound contains ounces, and the weight P placed at any of these subdivisions, so as to counterpoise what is in the scale, the pounds and odd ounces therein are by that means ascertained.

To this kind of lever may be reduced several sorts of instruments, such as scissars, pinchers, snuffers; which are made of levers acting contrary to one another: their prop or centre of motion being the pin which keeps them together.

In common practice, the longer arm of this lever greatly exceeds the weight of the shorter; which gains great advantage, because it adds so much to the power.

<sup>47</sup>  
The second kind of lever.

A lever of the second kind has the weight between the prop and the power. In this, as well as the former, the advantage gained is as the distance of the

power from the prop to the distance of the weight from the prop: for the respective velocities of the power and weight are in that proportion; and they will balance each other when the intensity of the power multiplied by its distance from the prop is equal to the intensity of the weight multiplied by its distance from the prop. Thus, if AB be a lever on which the weight W of 6 ounces hangs at the distance of 1 inch from the prop G, and a power P equal to the weight of 1 ounce hangs at the end B, 6 inches from the prop, by the cord CD going over the fixed pulley E, the power will just support the weight: and a small addition to the power will raise the weight 1 inch for every 6 inches that the power descends.

This lever shews the reason why two men carrying a burden upon a stick between them, bear unequal shares of the burden in the inverse proportion of their distances from it. For it is well known, that the nearer any of them is to the burden, the greater share he bears of it: and if he goes directly under it, he bears the whole. So, if one man be at G, and the other at P, having the pole or stick AB resting on their shoulders; if the burden or weight W be placed five times as near the man at G, as it is to the man at P, the former will bear five times as much weight as the latter. This is likewise applicable to the case of two horses of unequal strength, to be so yoked, as that each horse may draw a part proportionable to his strength; which is done by dividing the beam so, that the point of traction may be as much nearer to the stronger horse than to the weaker, as the strength of the former exceeds that of the latter.

To this kind of lever may be reduced oars, rudders of ships, doors turning upon hinges, cutting-knives which are fixed at the point of the blade, and the like.

If in this lever we suppose the power and weight to change places, so that the power may be between the weight and the prop, it will become a lever of the third kind: in which, that there may be a balance between the power and the weight, the intensity of the power must exceed the intensity of the weight just as much as the distance of the weight from the prop exceeds the distance of the power from it. Thus, let E be the prop of the lever AB, and W a weight of 1 pound, placed three times as far from the prop, as the power P acts at F, by the cord C going over the fixed pulley D: in this case, the power must be equal to three pounds, in order to support the weight.

To this sort of lever are generally referred the bones of a man's arm: for when we lift a weight by the hand, the muscle that exerts its force to raise that weight, is fixed to the bone about one tenth part as far below the elbow as the hand is. And the elbow being the centre round which the lower part of the arm turns, the muscle must therefore exert a force ten times as great as the weight that is raised.

As this kind of lever is a disadvantage to the moving power, it is never used but in cases of necessity; such as that of a ladder, which, being fixed at one end, is by the strength of a man's arms reared against a wall. And in clock-work, where all the wheels may be reckoned levers of this kind, because the power that moves every wheel, except the first, acts upon it near the centre of motion by means of a small pinion, and the resistance it has to overcome acts against the

Plate CLXXXI.  
fig.

<sup>48</sup>  
The third kind of lever.

Fig. 49

teeth

teeth round its circumference.

<sup>49</sup> The fourth kind of lever differs nothing from the first, but in being bended for the sake of convenience. ABC is a lever of this sort, bended at C, which is its prop, or centre of motion. P is a power acting upon the longer arm AC at F, by means of the cord DE going over the pulley G; and W is a weight of resistance acting upon the end B of the shorter arm BC. If the power be to the weight, as BC is to CF, they are in equilibrium. Thus, suppose W to be 5 pounds acting at the distance of one foot from the centre of motion C, and P to be 1 pound acting at F, five feet from the centre C, the power and weight will just balance each other. A hammer drawing a nail is a lever of this sort.

<sup>50</sup> The second mechanical power is the wheel and axle, in which the power is applied to the circumference of the wheel, and the weight is raised by a rope which coils about the axle as the wheel is turned round. Here it is plain that the velocity of the power must be to the velocity of the weight, as the circumference of the wheel is to the circumference of the axle: and consequently, the power and weight will balance each other, when the intensity of the power is to the intensity of the weight as the circumference of the axle is to the circumference of the wheel. Let AB be a wheel, CD its axle, and suppose the circumference of the wheel to be 8 times as great as the circumference of the axle; then, a power P equal to 1 pound hanging by the cord I, which goes round the wheel, will balance a weight W of 8 pounds hanging by the rope K, which goes round the axle. And as the friction on the pivots or gudgeons of the axle is but small, a small addition to the power will cause it to descend, and raise the weight: but the weight will rise with only an eighth part of the velocity wherewith the power descends, and consequently through no more than an eighth part of an equal space, in the same time. If the wheel be pulled round by the handles S, S, the power will be increased in proportion to their length. And by this means, any weight may be raised as high as the operator pleases.

To this sort of engine belong all cranes for raising great weights; and in this case, the wheel may have cogs all round it instead of handles, and a small lantern or trundle may be made to work in the cogs, and be turned by a winch; which will make the power of the engine to exceed the power of the man who works it, as much as the number of revolutions of the winch exceeds those of the axle D, when multiplied by the excess of the length of the winch above the length of the semidiameter of the axle, added to the semidiameter or half thickness of the rope K, by which the weight is drawn up. Thus, suppose the diameter of the rope and axle taken together to be 12 inches, and consequently half their diameters to be 6 inches; so that the weight W will hang at 6 inches perpendicular distance from below the centre of the axle. Now, let us suppose the wheel AB, which is fixt on the axle, to have 80 cogs, and to be turned by means of a winch 6 inches long, fixt on the axis of a trundle of 8 staves or rounds, working in the cogs of the wheel. Here it is plain, that the winch and trundle would make 10 revolutions for one of the wheel AB, and its axis D, on which the rope K winds in raising the weight W; and

the winch being no longer than the sum of the semidiameters of the great axle and rope, the trundle could have no more power on the wheel, than a man could have by pulling it round by the edge, because the winch would have no greater velocity than the edge of the wheel has, which we here suppose to be ten times as great as the velocity of the rising weight: so that in this case the power gained would be as 10 to 1. But if the length of the winch be 12 inches, the power gained will be as 20 to 1; if 18 inches (which is long enough for any man to work by), the power gained would be as 30 to 1; that is, a man could raise 30 times as much by such an engine, as he could do by his natural strength without it, because the velocity of the handle of the winch would be 30 times as great as the velocity of the rising weight; the absolute force of any engine being in proportion of the velocity of the power to the velocity of the weight raised by it. But then, just as much power or advantage is gained by the engine, so much time is lost in working it. In this sort of machines it is requisite to have a ratchet-wheel G on one end of the axle, with a catch H to fall into its teeth; which will at any time support the weight, and keep it from descending, if the workman should, through inadvertency or carelessness, quit his hold whilst the weight is raising. And by this means, the danger is prevented which might otherwise happen by the running down of the weight when left at liberty.

3. The third mechanical power or engine consists either of one moveable pulley, or a system of pulleys; some in a block or case which is fixed, and others in a block which is moveable and rises with the weight. For though a single pulley that only turns on its axis, and rises not without the weight, may serve to change the direction of the power, yet it can give no mechanical advantage thereto; but is only as the beam of a balance, whose arms are of equal length and weight. Thus, if the equal weights W and P hang by the cord BB upon the pulley A, whose block *b* is fixed to the beam HI, they will counterpoise each other, just in the same manner as if the cord were cut in the middle, and its two ends hung upon the hooks fixed in the pulley at A and A, equally distant from its centre.

But if a weight W hangs at the lower end of the moveable block *p* of the pulley D, and the cord GF goes under the pulley, it is plain that the half G of the cord bears one half of the weight W, and the half F the other; for they bear the whole between them. Therefore, whatever holds the upper end of either rope, sustains one half of the weight: and if the cord at F be drawn up so as to raise the pulley D to C, the cord will then be extended to its whole length, all but that part which goes under the pulley: and consequently, the power that draws the cord will have moved twice as far as the pulley D with its weight W rises; on which account, a power whose intensity is equal to one half of the weight will be able to support it, because if the power moves (by means of a small addition) its velocity will be double the velocity of the weight; as may be seen by putting the cord over the fixed pulley C (which only changes the direction of the power, without giving any advantage to it), and hanging on the weight P, which is equal only to one half of the weight W; in which case there will be an equilibrium, and

<sup>51</sup> The pulley.

Fig. 7.



and a little addition to P will cause it to defend, and raise W through a space equal to one half of that thro' which P defends. Hence, the advantage gained will be always equal to twice the number of pulleys in the moveable or undermost block. So that, when the upper or fixed block *u* contains two pulleys, which only turn on their axes, and the lower or moveable block *U* contains two pulleys, which not only turn upon their axes, but also rise with the block and weight; the advantage gained by this is as 4 to the working power. Thus, if one end of the rope KMOQ be fixed to a hook at *I*, and the rope passes over the pulleys *N* and *R*, and under the pulleys *L* and *P*, and has a weight *T*, of one pound, hung to its other end at *T*, this weight will balance and support a weight *W* of four pounds hanging by a hook at the moveable block *U*, allowing the said block as a part of the weight. And if as much more power be added, as is sufficient to overcome the friction of the pulleys, the power will defend with four times as much velocity as the weight rises, and consequently thro' four times as much space.

The two pulleys in the fixed block *X*, and the two in the moveable block *Y*, are in the same case with those last mentioned; and those in the lower block give the same advantage to the power.

As a system of pulleys has no great weight, and lies in a small compass, it is easily carried about; and can be applied, in a great many cases, for raising weights, where other engines cannot. But they have a great deal of friction on three accounts: 1. Because the diameters of their axes bear a very considerable proportion to their own diameters; 2. Because in working they are apt to rub against one another, or against the sides of the block; 3. Because of the stiffness of the rope that goes over and under them.

4. The fourth mechanical power is the *inclined plane*; and the advantage gained by it is as great as its length exceeds its perpendicular height. Let *AB* be a plane parallel to the horizon, and *CD* a plane inclined to it; and suppose the whole length *CD* to be three times as great as the perpendicular height *GF*: in this case, the cylinder *E* will be supported upon the plane *CD*, and kept from rolling down upon it, by a power equal to a third part of the weight of the cylinder. Therefore, a weight may be rolled up this inclined plane with a third part of the power which would be sufficient to draw it up by the side of an upright wall. If the plane was four times as long as high, a fourth part of the power would be sufficient; and so on in proportion. Or, if a pillar was to be raised from a floor to the height *GF*, by means of the engine *ABDC*, (which would then act as a half wedge, where the resistance gives way only on one side) the engine and pillar would be *in equilibrio* when the power applied at *GF* was to the weight of the pillar as *GF* to *GD*; and if the power be increased, so as to overcome the friction of the engine against the floor and pillar, the engine will be driven, and the pillar raised: and when the engine has moved its whole length upon the floor, the pillar will be raised the whole height of the engine from *G* to *F*.

The force wherewith a rolling body descends upon an inclined plane, is to the force of its absolute gravity, by which it would descend perpendicularly in a

free space, as the height of its plane is to its length. For, suppose the plane *AB* to be parallel to the horizon, the cylinder *C* will keep at rest upon any part of the plane where it is laid. If the plane be so elevated, that its perpendicular height *D* is equal to half its length *AB*, the cylinder will roll down upon the plane with a force equal to half its weight; for it would require a power (acting in the direction of *AB*) equal to half its weight, to keep it from rolling. If the plane *AB* be elevated, so as to be perpendicular to the horizon, the cylinder *C* will defend with its whole force of gravity, because the plane contributes nothing to its support or hindrance; and therefore, it would require a power equal to its whole weight to keep it from descending.

Let the cylinder *C* be made to turn upon slender pivots in the frame *D*, in which there is a hook *e*, with a line *G* tied to it: let this line go over the fixed pulley *H*, and have its other end tied to the hook in the weight *I*. If the weight of the body *I*, be to the weight of the cylinder *C*, added to that of its frame *D*, as the perpendicular height of the plane *LM* is to its length *AB*, the weight will just support the cylinder upon the plane, and a small touch of a finger will either cause it to ascend or descend with equal ease: then, if a little addition be made to the weight *I*, it will descend, and draw the cylinder up the plane. In the time that the cylinder moves from *A* to *B*, it will rise thro' the whole height of the plane *ML*; and the weight will defend from *H* to *K*, thro' a space equal to the whole length of the plane *AB*.

If the plane be made to move upon rollers or friction-wheels, and the cylinder be supported upon it; the same power will draw the plane under the cylinder, which before drew the cylinder up the plane, provided the pivots of the axes of the friction-wheels be small, and the wheels themselves be pretty large. For, let the machine *ABC* (equal in length and height to *ABM*, fig. 12.) be provided with four wheels, whereof two appear at *D* and *E*, and the third under *C*, whilst the fourth is hid from sight by the horizontal board *a*. Let the cylinder *F* be laid upon the lower end of the inclined plane *CB*, and the line *G* be extended from the frame of the cylinder, about six feet parallel to the plane *CB*; and, in that direction, fixed to a hook in the wall; which will support the cylinder, and keep it from rolling off the plane. Let one end of the line *H* be tied to a hook at *C* in the machine, and the other end to a weight *K*, the same as drew the cylinder up the plane before. If this line be put over the fixed pulley *I*, the weight *K* will draw the machine along the horizontal plane *LM*, and under the cylinder *F*: and when the machine has been drawn the whole length *CB*, the cylinder will be raised to *d*, equal to the perpendicular height *AB* above the horizontal part at *A*.

To the inclined plane may be reduced all hatchets, chisels, and other edge-tools which are chamfered only on one side.

From the theory of the inclined plane also may be deduced the doctrine of pendulums; the foundation of which is as follows. A body acquires the same velocity in falling down the oblique side of a plane that it would do if it fell freely through the perpendicular height of it. For, the square of the velocity which

Fig. 9.

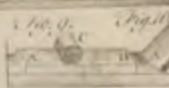
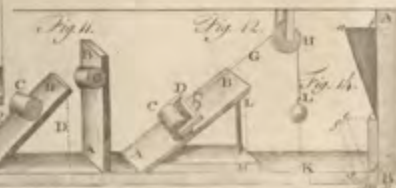
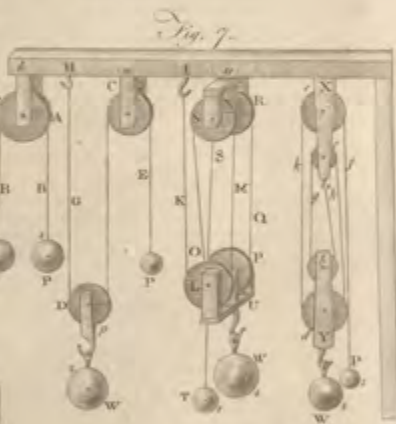
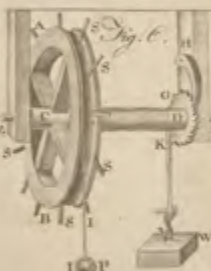
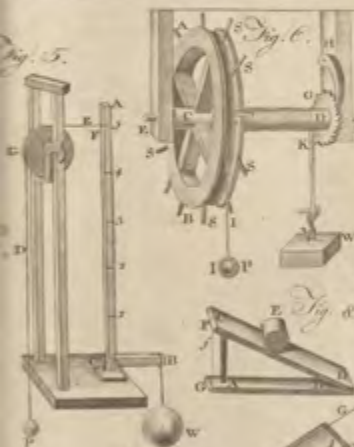
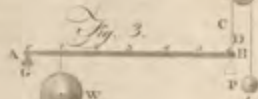
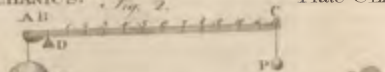
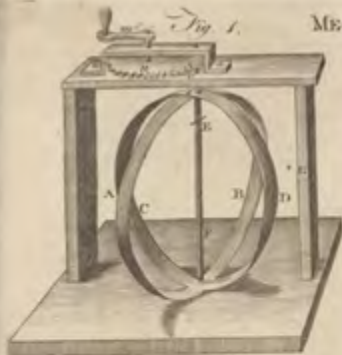
Fig. 10.

Fig. 11.

Fig. 12.

Fig. 13.

52  
The inclined plane.  
Plate CLXXI.  
fig. 8.



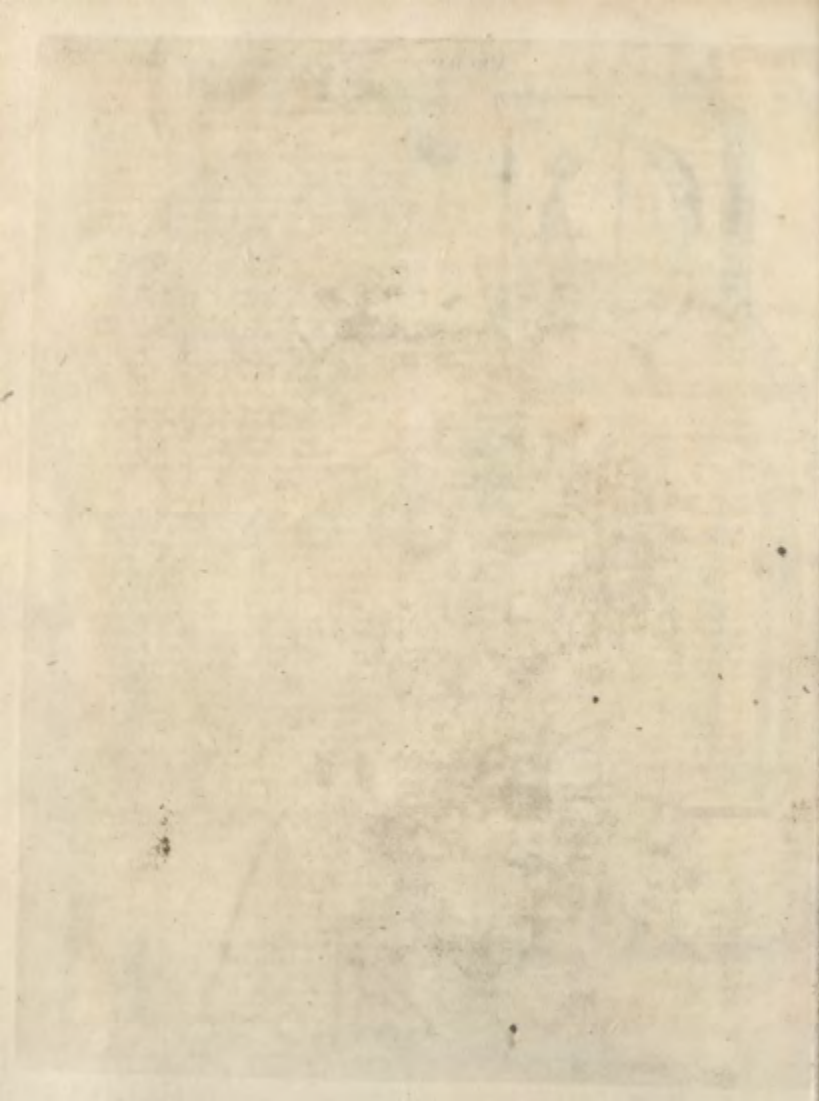




Plate  
CLXVII.  
fig. 3.

a body acquires by falling to C as the space AG is to the space AC, as hath been already shown n<sup>o</sup> 14; that is, (by 8 El. 6. and Def. 10. El. 5.) as AG to ABg; consequently the velocity itself at G is to the velocity itself at C, as AG to AB: But since AG is run over in the same time as AB, the velocity in G is also to the velocity in B as AG to AB; and consequently, since the velocities both in C and B bear the same proportion to that in G, they must be equal to each other.

Again: A body takes up the same time in falling through the chord of a circle, whether long or short, that it does in falling perpendicularly thro' the diameter of the same circle. For, seeing a body will fall from A to G, on the inclined plane ABC, in the same time another would fall freely to B provided AGB is a right angle, in which case AG (by 31 El. 3.) is a chord of that circle of which AB is the diameter; therefore, a body falls thro' the chord of a circle in the same time that it falls thro' the diameter; for the same demonstration will serve for any other chord.

Hence it follows, that if a pendulum could be made to vibrate in the chord of a circle instead of an arch, all its vibrations would be performed in the same time whether they were large or small.

Fig. 4.

This may be illustrated by conceiving the last figure inverted (as in fig. 4.) where supposing the ball suspended in such a manner as to swing in the right line GA instead of the arch GA, it would always fall through it in the same time, however long or short it was; for the inclination of the line GA to the horizontal line BC, is not altered by inverting the figure.

From hence we see the reason, why the shorter arches a pendulum describes, the nearer its vibrations come to an equality, for small arches differ less from their chords than large ones. But if the pendulum is made to vibrate in a curve, which mathematicians call a *cycloid*; each swing will then be performed in the same time, whether the pendulum moves through a larger or lesser space. For the nature of this curve is such, that the tendency of a pendulum towards the lowest point of it is always in proportion to its distance from thence; and consequently let that distance be more or less, it will always be run over by the pendulum in the same time.

Fig. 5.

Upon the right line AB, let the circle CDE be so placed as to touch the line in the point C; then let this circle roll along upon it from C to H, as a wheel upon the ground; then will the point C in one revolution of the circle describe the curve CKH, which is called a *cycloid*. Now suppose two plates of metal bent into the form HK and KC, and placed in the situation LH and LC, in such manner, that the points H and C may be applied to L, and the points answering to K be applied to H and C. This done, if a pendulum as LP, in length equal to LH, be made to vibrate between the plates or cheeks of the cycloid LC and LH, it will swing in the line CKH; and the time of each vibration, whether the pendulum swings through a small or a great part of the cycloid, will be to the time a body takes up in falling perpendicularly through a space equal to IK (half the length of the pendulum), as the circumference of a circle to its diameter, and consequently it will always be the same.

The time of the descent and ascent of a pendulum, supposing it to vibrate in the chord of a circle, is equal to the time in which a body falling freely would descend through eight times the length of the pendulum.

For the time of the descent alone upon the chord is equal to that in which a body would fall through the diameter of the circle; that is, twice the length of the pendulum: but in twice that time (viz. during a whole vibration) the body would fall four times as far; that is, through eight times the length of the pendulum.

The times, that pendulums of different lengths perform their vibrations in, are as the square roots of their lengths.

Fig. 6. 7.

*Dem.* Let there be two pendulums A and B of different lengths, the time the first vibrates in (suppose through a chord) is equal to the time in which a body would fall freely through DA, the diameter of the circle; in like manner the time B vibrates in is that in which a body would fall through FB. Now the times in which bodies fall through different spaces are as the square roots of those spaces, that is, of DA and FB, or of their halves CA and CB, i. e. of the lengths of the pendulums.

The centre of *oscillation*, is a point in which if the whole gravity of a pendulum was collected, the time of its vibration would not be altered thereby.

The rule for finding the centre of oscillation.

Fig. 8.

If the ball AB be hung by the string CD, whose weight is inconsiderable, the centre of oscillation is found thus: suppose E the centre of the globe; take the line K of such a length, that it shall bear the same proportion to ED as ED to EC; then EH being made equal to  $\frac{2}{3}$  of K, the point H shall be the centre of oscillation.

Fig. 9.

If the weight of the rod CD be too considerable to be neglected, divide CD in I, so that DI may be equal to  $\frac{1}{2}$  of CD; and make a line as G, in the same proportion to CI, that the weight of the rod bears to that of the globe; then having found H the centre of oscillation of the globe, as before, divide IH in L, so that IL may bear the same proportion to LH, as the line CH bears to the line G; then will L be the centre of oscillation of the whole pendulum.

This is the point from whence the length of a pendulum is measured, which in our latitude, in a pendulum that swings seconds, is 39 inches and two-tenths.

The squares of the times in which pendulums, acted upon by different degrees of gravity, perform their vibrations in, are to each other, inversely as the gravities.

*Dem.* The spaces falling bodies descend through are as the squares of the times, when the gravity by which they are impelled is given; and as the gravity, when the time is given (for the sum of the velocities produced in any time will always be as the generating forces;) consequently, when neither is given, they are in a ratio compounded of both; the squares of the times are therefore inversely as the gravities. [For if in 3 quantities a, b, c, a is as b c, then b: b  $\frac{a}{c}$ , i. e. if a is given, as  $\frac{1}{c}$  or as c inversely.] But if the squares of the times, in which bodies fall thro' given spaces,

spaces, are inversely as the gravities by which they are acted upon; then the squares of the times, in which pendulums of equal lengths perform their vibrations, will be also in the same ratio, on account of the constant equality between the time of the vibration of a pendulum, and of the descent of a body through eight times its length.

From whence it follows, that a pendulum will vibrate slower when nearer the equator, than the same when nearer the poles; for the gravity of all bodies is less, the nearer they are to the equator; viz. on account of the spheroidal figure of the earth, and its rotation about its axis. To which we may add the increase of the length of the pendulum occasioned by the heat in those parts: (for we find by experiment, that bodies are enlarged in every dimension in proportion to the degree of heat that is given them;) for which reason the vibrations of the pendulum will also be slower.

53  
The wedge  
Plate  
CLXXXII.  
fig. 1.  
Fig. 2.

5. The fifth mechanical power or engine is the *wedge*; which may be considered as two equally inclined planes DEF and CEF, joined together at their bases *EF*: then, DC is the whole thickness of the wedge at its back ABCD, where the power is applied; EF is the depth or height of the wedge; DF the length of one of its sides, equal to CF the length of the other side; and OF is its sharp edge, which is entered into the wood intended to be split by the force of a hammer or mallet striking perpendicularly on its back. Thus, AB *b* is a wedge driven into the cleft CDE of the wood FG.

When the wood does not cleave at any distance before the wedge, there will be an equilibrium between the power impelling the wedge downward, and the resistance of the wood acting against the two sides of the wedge; if the power be to the resistance, as half the thickness of the wedge at its back is to the length of either of its sides; that is, as *Aa* to *Ab*, or *Ba* to *Bb*. And if the power be increased, so as to overcome the friction of the wedge and the resistance arising from the cohesion or stickage of the wood, the wedge will be drove in, and the wood split asunder.

But when the wood cleaves at any distance before the wedge (as it generally does), the power impelling the wedge will not be to the resistance of the wood, as half the thickness of the wedge is to the length of one of its sides, but as half its thickness is to the length of either side of the cleft, estimated from the top or acting part of the wedge. For if we suppose the wedge to be lengthened down from *b* to the bottom of the cleft, at *E*, the same proportion will hold; namely, that the power will be to the resistance, as half the thickness of the wedge is to the length of either of its sides; or, which amounts to the same thing, as the whole thickness of the wedge is to the length of both its sides.

In order to prove what is here advanced concerning the wedge, let us suppose the wedge to be divided lengthwise into two equal parts; and then it will become two equally inclined planes; one of which, as *abc*, may be made use of as a half wedge for separating the moulding *cd* from the wainscot AB. It is evident, that when this half wedge has been driven its whole length *ac* between the wainscot and moulding, its side *ac* will be at *ed*, and the moulding will be se-

parated to *fg* from the wainscot. Now, from what has been already proved of the inclined plane, it appears, that to have an equilibrium between the power impelling the half wedge and the resistance of the moulding, the former must be to the latter as *ab* to *ac*; that is, as the thickness of the back which receives the stroke is to the length of the side against which the moulding acts. Therefore, since the power upon the half wedge is to the resistance against its side, as the half back *ab* is to the whole side *ac*, it is plain, that the power upon the whole wedge (where the whole back is double the half back) must be to the resistance against both its sides, as the thickness of the whole back is to the length of both the sides, supposing the wedge at the bottom of the cleft; or as the thickness of the whole back to the length of both sides of the cleft, when the wood splits at any distance before the wedge. For, when the wedge is driven quite into the wood, and the wood splits at ever so small a distance before its edge, the top of the wedge then becomes the acting part, because the wood does not touch it any where else. And since the bottom of the cleft must be considered as that part where the whole stickage or resistance is accumulated, it is plain, from the nature of the lever, that the farther the power acts from the resistance, the greater is the advantage.

Some writers have advanced, that the power of the wedge is to the resistance to be overcome, as the thickness of the back of the wedge is to the length only of one of its sides; which seems very strange: for, if we suppose AB to be a strong inflexible bar of wood or iron fixed into the ground at C B, and D and E to be two blocks of marble lying on the ground on opposite sides of the bar; it is evident that the block D may be separated from the bar to the distance *d*, equal to *a b*, by driving the inclined plane or half wedge *abc* down between them; and the block E may be separated to an equal distance on the other side, in like manner, by the half wedge *cde*. But the power impelling each half wedge will be to the resistance of the block against its side, as the thickness of that half wedge is to the length of its acting side. Therefore the power to drive both the half wedges is to both the resistances, as both the half backs is to the length of both the acting sides, or as half the thickness of the whole back is to the length of either side. And if the bar be taken away, the blocks put close together, and the two half wedges joined to make one, it will require as much force to drive it down between the blocks, as is equal to the sum of the separate powers acting upon the half wedges when the bar was between them.

To confirm this by an experiment, let two cylinders, as AB and CD, be drawn towards one another by lines running over fixed pulleys, and a weight of 40 ounces hanging at the lines belonging to each cylinder: and let a wedge of 40 ounces weight, having its back just as thick as either of its sides is long, be put between the cylinders, which will then act against each side with a resistance equal to 40 ounces, whilst its own weight endeavours to bring it down and separate them: And here, the power of the wedge's gravity impelling it downward, will be to the resistance of both the cylinders against the wedge, as the thickness of the wedge is to the length of both its sides;

for

for there will then be an equilibrium between the weight of the wedge and the resistance of the cylinders against it, and it will remain at any height between them; requiring just as much power to push it upward as to pull it downward. If another wedge of equal weight and depth with this, and only half as thick, be put between the cylinders, it will require twice as much weight to be hung at the ends of the lines which draw them together, to keep the wedge from going down between them. That is, a wedge of 40 ounces, whose back is only equal to half the length of one of its sides, will require 80 ounces to each cylinder, to keep it in an equilibrium between them: and twice 80 is 160, equal to four times 40. So that the power will be always to the resistance, as the thickness of the back of the wedge is to the length (not of its one side, but) of both its sides.

Plate  
CLXXII.  
fig. 4.

The best way, though perhaps not the neatest, for making a wedge with its appurtenances for such experiments is as follows. Let IKLM and LMNO be two flat pieces of wood, each about 15 inches long, and three or four in breadth, joined together by a hinge at LM; and let P be a graduated arch of brass, on which the said pieces of wood may be opened to any angle not more than 60 degrees, and then fixed at the given angle by means of the two screws *a* and *b*. Then, IKNO will represent the back of the wedge LM, its sharp edge which enters the wood, and the outides of the pieces IKLM and LMNO the two sides of the wedge against which the wood acts in cleaving. By means of the said arch, the wedge may be opened so as to adjust the thickness of its back in any proportion to the length of either of its sides, but not to exceed that length: and any weight, as *p*, may be hung to the wedge upon the hook M; which weight, together with the weight of the wedge itself, may be considered as the impelling power; which is all the same in experiment, whether it be laid upon the back of the wedge to push it down, or hung to its edge to pull it down. Let AB and CD be two wooden cylinders, each about two inches thick, where they touch the outides of the wedge; and let their ends be made like two round flat plates, to keep the wedge from slipping off endwise between them. Let a small cord, with a loop on one end of it, go over a pivot in the end of each cylinder, and the cords S and T belonging to the cylinder AB go over the fixed pulleys W and X, and be fastened at their other ends to the bar *w*<sub>1</sub>, on which any weight as Z may be hung at pleasure. In like manner, let the cords Q and R belonging to the cylinder BC go over the fixed pulleys U and V to the bar *uv*, on which a weight Y equal to Z may be hung. These weights, by drawing the cylinders towards one another, may be considered as the resistance of the wood acting equally against opposite sides of the wedge; the cylinders themselves being suspended near, and parallel to each other, by their pivots, in loops on the lines E, F, G, H; which lines may be fixed to hooks in the ceiling of the room. The longer these lines are the better; and they should never be less than four feet each. The farther also the pulleys WV and WX are from the cylinders, the truer will the experi-

ments be: and they may turn upon pins fixed into the wall.

In this machine, the weights Y and Z, and the weight *p*, may be varied at pleasure, so as to be adjusted in proportion of the length of the wedge's sides to the thickness of its back; and when they are so adjusted, the wedge will be in *equilibrium* with the resistance of the cylinders.

The wedge is a very great mechanical power, since not only wood but even rocks can be split by it; which would be impossible to effect by the lever, wheel and axle, or pulley: for the force of the blow, or stroke, shakes the cohering parts, and thereby makes them separate the more easily.

6. The sixth and last mechanical power is the *screw*; which cannot properly be called a *simple machine*, because it is never used without the application of a lever or winch to assist in turning it: and then it becomes a compound engine of a very great force either in pressing the parts of bodies close together, or in raising great weights. It may be conceived to be made by cutting a piece of paper ABC (fig. 5.) into the form of an inclined plane or half wedge, and then coiling it round a cylinder AB (fig. 6.). And here it is evident, that the winch E must turn the cylinder once round before the weight of resistance D can be moved from one spiral winding to another, as from *d* to *c*; therefore, as much as the circumference of a circle described by the handle of the winch is greater than the interval or distance between the spirals, so much is the force of the screw. Thus, supposing the distance between the spirals to be half an inch, and the length of the winch to be 12 inches; the circle described by the handle of the winch where the power acts will be 76 inches nearly, or about 152 half-inches, and consequently 152 times as great as the distance between the spirals: and therefore a power at the handle, whose intensity is equal to no more than a single pound, will balance 152 pounds acting against the screw; and as much additional force, as is sufficient to overcome the friction, will raise the 152 pounds; and the velocity of the power will be to the velocity of the weight as 152 to 1. —Hence it appears, that the longer the winch be made, and the nearer the spirals are to one another, so much the greater is the force of the screw.

A machine for shewing the force or power of the screw may be contrived in the following manner. Let the wheel C have a screw *ab* on its axis, working in the teeth of the wheel D, which suppose to be 48 in number. It is plain, that for every time the wheel C and screw *ab* are turned round by the winch A, the wheel D will be moved one tooth by the screw; and therefore, in 48 revolutions of the winch, the wheel D will be turned once round. Then, if the circumference of a circle described by the handle of the winch be equal to the circumference of a groove *e* round the wheel D, the velocity of the handle will be 48 times as great as the velocity of any given point in the groove. Consequently, if a line G (above number 48) goes round the groove *e*, and has a weight of 48 pounds hung to it below the pedestal EF, a power equal to one pound at the handle will balance

54  
The screw.  
Fig. 5. 6.

Fig. 7.

and



and support the weight. To prove this by experiment, let the circumferences of the grooves of the wheels C and D be equal to one another; and then if a weight H of one pound be suspended by a line going round the groove of the wheel C, it will balance a weight of 48 pounds hanging by the line G; and a small addition to the weight H will cause it to descend, and so raise up the other weight.

If the line G, instead of going round the groove  $e$  of the wheel D, goes round its axle I; the power of the machine will be as much increased, as the circumference of the groove  $e$  exceeds the circumference of the axle: which, supposing it to be 6 times, then one pound at H will balance 6 times 48, or 288 pounds hung to the line on the axle: and hence the power or advantage of this machine will be as 288 to 1. That is to say, a man, who by his natural strength could lift an hundred weight, will be able to raise 288 hundred, or  $14\frac{4}{5}$  ton weight, by this engine.

Plate  
CLXXII.  
fig. 8.  
55

A combination of  
all the  
mechanical  
powers.

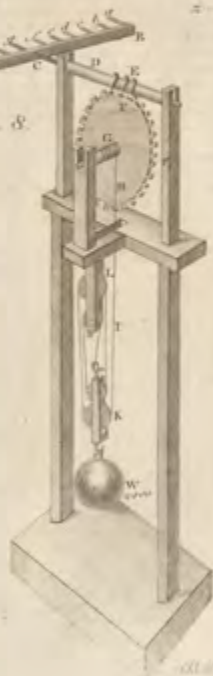
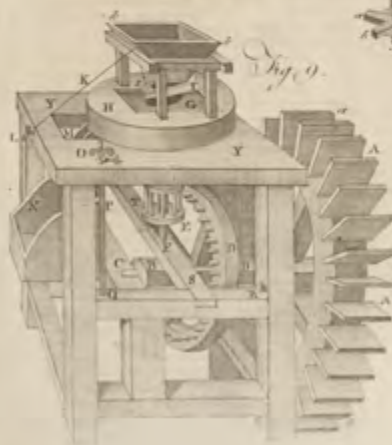
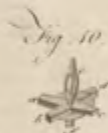
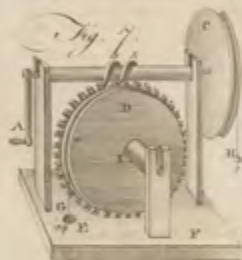
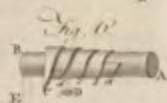
But the following engine is still more powerful, on account of its having the addition of four pulleys: and in it we may look upon all the mechanical powers as combined together, even if we take in the balance. For as the axis D of the bar AB is in its middle at C, it is plain, that, if equal weights are suspended upon any two pins equidistant from the axis C, they will counterpoise each other.—It becomes a lever by hanging a small weight P upon the pin  $n$ , and a weight as much heavier upon either of the pins  $b$ ,  $c$ ,  $d$ ,  $e$ , or  $f$ , as is in proportion to the pins being so much nearer the axis. The wheel and axle FG is evident: so is the screw E; which takes in the inclined plane, and with it the half wedge. Part of a cord goes round the axle, the rest under the lower pulleys K,  $m$ , over the upper pulleys L,  $n$ , and then it is tied to a hook at  $m$  in the lower or moveable block, on which hangs the weight W.

In this machine, if the wheel F has 30 teeth, it will be turned once round in 30 revolutions of the bar AB, which is fixed on the axis D of the screw E: if the length of the bar is equal to twice the diameter of the wheel, the pins  $a$  and  $n$  at the ends of the bar will move 60 times as fast as the teeth of the wheel do: and consequently, one ounce at P will balance 60 ounces hung upon a tooth at  $q$  in the horizontal diameter of the wheel. Then, if the diameter of the wheel F is 10 times as great as the diameter of the axle G, the wheel will have 10 times the velocity of the axle; and therefore one ounce P at the end of the lever AC will balance 10 times 60, or 600 ounces hung to the rope H which goes round the axle. Lastly, if four pulleys be added, they will make the velocity of the lower block K, and weight W, four times less than the velocity of the axle: and this being the last power in the machine, which is four times as great as that gained by the axle, it makes the whole power of the machine 4 times 600, or 2400. So that a man who could lift 100 weight in his arms by his natural strength, would be able to raise 2400 hundred-weight by this engine.

By one or more of these simple powers, all great weights are raised to considerable heights: but in them all, the more they diminish the weight, the more slow they are in their operations, and conse-

quently the more do they retard the workman's dispatch; and universally the more simple they are, the more expeditious. Besides this, their friction or rubbing against each other greatly diminishes their power. The friction in the balance is least, it is more in the lever, increased in the axle and wheel, yet more in the pulley, but most of all in the screw. In general, in combined engines, upon account of this friction, they will require a third part more of power to move them, than the theory allows. For this reason, therefore, it will for ever be impossible to fulfil the boast of Wilkins, who vaunted that he could pull up an oak by the roots with a single horse-hair; for the force requisite to work the machine in pulling it up, would nearly amount to a third part of the force which the machine exerts. The large capstan and pulley, used in lanching a man of war, would in theory do it most effectually. A simple lever, drawn a proper length by the imagination, would do it as well; it would even fulfil the great boast of Archimedes, it would remove the earth itself. The learned often amuse themselves with fancies like these; and it was for this that Cicero called *Archimedes* a trifler.—As the friction of machines, however, forms a very considerable resisting power in mechanics, we shall here subjoin those methods by which it can best be computed.

The doctrine of friction, as ascertained by the latest experiments, may be summed up in the following manner. 1. When one body insists on another upon a horizontal plane, it presses it with its whole weight; which being equally re-acted on, and consequently the whole effect of its gravity destroyed by the plane, it will be absolutely free to move in any horizontal direction by any the least power applied thereto, provided both the touching surfaces be perfectly smooth. 2. But since we find no such thing as perfect smoothness in the surfaces of bodies, but an evident roughness or unevenness of the parts in their surface, arising from their porosity and peculiar texture, it is easy to understand, that, when two such surfaces come together, the prominent parts of one will, in some measure, fall into the concave parts of the other; and therefore, when an horizontal motion is attempted in one, the fixed prominent parts of the other will give more or less resistance to the moving surface, by holding and detaining its parts; and this is what we call *friction*. 3. Now since any body will require a force proportional to its weight to draw it over a given obstacle, it follows, that the friction arising to the moving body will always be in proportion to its weight only, and not the quantity of the surface by which it bears upon the resisting plane or surface. Thus, if a piece of wood four inches wide and one thick, be laid upon another fixed piece of the same wood, it will require the same weight to draw it along, whether it be laid on its broad or narrow side. 4. For though there be four times the number of touching particles on the broad side (*ceteris paribus*), yet each particle is pressed with but  $\frac{1}{4}$  of the weight that those are on the narrow side; and since four times the number, multiplied by  $\frac{1}{4}$  of the weight, is equal to  $\frac{1}{4}$  of the number multiplied by four times the weight, it is plain the resistance is equal in both cases, and so requires the same force to overcome it. 5. The reason why friction is proportional







to the weight of the moving body, is, because the power applied to move the body must raise it over the prominent parts of the surface on which it is drawn; and this motion of the body, as it is not upright, so it will not require a power equal to its whole weight; but being in the nature of the motion on an inclined plane, it will require only a part of its own weight, which will vary with the various degrees of smoothness and asperity. 6. It is found by experiment, that a body will be drawn along by nearly  $\frac{1}{3}$  of its weight; and if the surfaces be hard and well polished, by less than a third part; whereas, if the parts be soft or ragged, it will require a much greater weight. Thus also the cylinder of wood AB, if very smooth, and laid on two well polished supporters C D, (having been first oiled or greased) and then charged with the weight of two pounds in the two equal balls G H, it will require an additional weight  $x$ , equal to about a third part of the two pounds, to give motion to or overcome the friction of the said cylinder. 7. Now this additional weight, as it causes a greater weight of the cylinder, will likewise increase the friction; and therefore require the addition of another weight  $y$ , equal to the third part of its own weight: for the same reason, the weight  $y$  will require another  $z$ , a third part less; and so on *ad infinitum*. Hence, supposing the friction to be precisely a third of the weight, the first weight with all the additional ones, viz.  $2, \frac{2}{3}, \frac{2}{9}, \frac{2}{27}$ , &c. will be a series of numbers in geometrical progression decreasing. Now the sum of all these terms, except the first, is found, by a well-known theorem in arithmetic, to be equal to one pound. So that if the weight of the cylinder be inconsiderable, the readiest way to overcome the friction would be to double the power G, or H, at once. 8. But though we may, at a medium, allow a third part of the weight with which any simple machine is charged, for the friction arising from thence; yet this is very precarious, and seldom is the case: for if ABCD be a piece of brass of six ounces, and EFGH be also a plate of brass, and both the surfaces well ground and polished, the weight P of near two ounces will be required to draw along the body AC alone; but if AC be loaded with 6, 8, or 10 lb. then a sixth part of the weight will be sufficient to draw it along the plane. On the other hand, if the plane be covered with a linen or woollen cloth, then a third or half part, and sometimes more, will be requisite to draw it along on the plane. 9. Yet notwithstanding the difficulty and uncertainty attending the estimation of the quantity of friction, it is still a most useful and necessary inquiry, how and by what means the friction of any machine may be diminished. In order to this, we must consider friction mechanically, or as a force acting against a power applied to overcome it. Thus suppose AB an upright stem or shaft, turning freely in the socket B fixed in the table or plane IKLM; and AC, DE, two arms fixed in the said shaft, the latter of which, DE, has three pins going into a socket in the middle of heavy weights, F, G, or H, in such a manner, that when a power applied at C moves the lever AC, it causes the lever DE to protrude or thrust along the weights at F, G, or H, in a circular manner upon the table. 10. Now since we suppose the weight, all the while it

is in motion, is freely and wholly supported by the plane, it follows that all the resistance it can give to the power applied to C, is only what arises from its friction on the plane. What this friction is, will be found by applying the weight at G, so that BG be equal to AC; for then the power applied to C, acting in a tangent to the circle CRS, that shall just move the weight G, will be equal to its friction. But if the weight be applied at F, because BF is greater than AC, the same power at C, as before, will not move it, by reason its force is here increased by having a greater velocity than the power; as, on the other hand, if placed at H, a less power at C shall move it, because of its having there less velocity than the power, as is evident from the properties of the lever. 11. Hence we understand, that though the weight of a machine remains the same; yet the friction may be diminished, by contriving that the parts on which it moves and rubs, shall have less velocity than the power which moves it: thus, if the cylinder AB (fig. 6.) were to move on the two small pins or gudgeons E, F, the friction would be abated in the proportion of the diameter of the cylinder to that of the pins. 12. The friction on these gudgeons is still farther diminished by causing them to move on the circumference of a wheel: thus, let F be the gudgeon of the cylinder, revolving on the wheel CDE (fig. 9.), the velocity of the wheel's circumference will be the same with that of the gudgeon; but the velocity of the wheel's axis AB (which is now to be considered as the rubbing part) is less than that of the wheel, in proportion as its diameter is less than that of the wheel: for example, if the friction of the cylinder moving on its surface be  $\frac{1}{3}$  part of the weight, and the gudgeon be to the cylinder as 1:10, they will reduce the friction to  $\frac{1}{30}$  part; and if, again, the axis of the wheel be to the wheel as 1:10, the wheel will reduce the friction to  $\frac{1}{300}$  part; and if the axis of this wheel be laid on the perimeter of another wheel, the friction will be reduced to a still lesser part of the weight; so that you may proceed in this manner to diminish the friction *ad infinitum*; and wheels applied in this manner are called *friction-wheels*. 13. Besides what has been already said, somewhat farther is necessary to diminish the friction of wheel-carriages. It was before observed, that friction arose chiefly by lifting the body over the prominent parts of the plane on which it is moved: now if we can contrive to move the body along without lifting or sustaining its weight, we shall move it without much friction; and this may be done by laying the body on any moveable circular subject, as rollers, wheels, &c.: thus let AB (fig. 10.) be the section of any heavy body, laid on a roller EF, upon the plane CD, and drawn by the power P; it is evident, when AB moves, the asperities of its surface will lay hold on those of the roller, and move it likewise; and it is as evident, that when the body AB is drawn against the prominent parts of the roller, they immediately give way, and make no resistance: thus the perpendicular diameter  $ab$  yields into the situation  $ef$ , and  $cd$  succeeds in its place. By this circular motion of the roller, its prominent parts below do only descend and move upon or over, and are not drawn against, the fixed prominent parts of the plane, and so receive no resistance from them. Hence the

the body A B is conveyed along without being lifted up, in the same manner as a wheel is moved by a pinion without any considerable resistance.

#### CHAP. IV. *Of Man, considered as an artificial Machine.*

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Machinery  
of the human  
frame.

MAN has been considered by anatomists as a system of all the artificial machines united in the human fabric; they have found the lever, the pulley, the axle in the wheel, the wedge, and even the screw, or at least something resembling each of them, in his person: thus, his arms have been likened to levers; his head, turning upon its axle; the digastric muscle that assists his swallowing, to a rope running over its pulley; the glands, as lifting up their fluids in the manner of an artificial water-screw; and his teeth have been compared to wedges. But some have not stopp'd here: they have gone on not only to please themselves with the resemblance, but to estimate the force of man through all his vital and involuntary motions, such as the running of the blood through his veins, the drawing his breath, and such like, by the inflexible laws of mechanism. They have even applied geometrical rules to measure objects constantly in change, and built theories upon proportions they were unable to discover. Thus, when Borelli once got the hint of comparing the muscles or fleshy parts to cords, he then readily built this theory, and calculated the human force by considering the thickness of the cords, and the length of the lever. Thus, when another found the similitude between the blood running thro' its channels, and water spouting through pipes, he pursued the speculation, till he at last was taught to believe that vomits would cure a spitting of blood, and bathing in warm water would be a remedy for the dropsy; happy, however, had his theory never been put into practice.

It is as impossible to determine the muscular force of any man by the bare inspection or admeasurement of his muscles, as it is to measure the swiftness of the circulation of his fluids by the spouting of his blood from a vein. Neither can be done, though Cheyne has pretended to demonstrate, that if we compare the muscular strength of two animals, that animal whose fluids circulate twice as swift will be six times as strong. Freind and Wainright adopted his demonstration, for he called it a *demonstration*; and indeed it was drawn up with a sufficient degree of mathematical parade. Martin, however, in a treatise entitled *De similibus animalibus*, has demonstrated that Cheyne's demonstration was false; but it was in order to establish another demonstration of his own. He asserted, that the force in similar animals was as the cube roots of the fourth powers of the limb put into motion. The learner will not perhaps understand the precise meaning of these words; but it is no matter, for his demonstration is as false as the former.

From the mere dimensions of the muscles in two similar animals, it is impossible to determine their force. The strength of the muscle is generally more in proportion to the exercise it has been employed in, than to its size; the legs of a chairman are stronger; the arms of a smith: in short, to use the words of a bully in a Spanish comedy, who mistook his man and

was beaten, we can never know the strength of the muscles till we experience their effects.

But, though we cannot determine, with any precision, of two men which are strongest; yet, in the same man, we can compare the force of his muscles with rather more precision: this at least can be said with great certainty, that those muscles which are inserted into the bone, nearest to the place where it moves upon another, overcome the greatest resistance, and consequently act with the greatest force. But to a learner this wants explanation.

All our flesh is composed of muscles, which (if we may use a vulgar similitude) are like red ribbonds, and almost all have one of their ends fixed into one bone, and another of their ends into some other bone. Thus, if we feel the great ham-string, which is made up of many muscles, we shall find that at one end it is fixed into the bones of the leg, just under the knee, and at the other end it runs upwards, partly to be fixed in the great bone of the thigh. The muscles being thus stretched from one bone to another, have a wonderful power of contracting and shortening themselves at pleasure; and when we choose to put them into action, they swell in the middle, somewhat into the shape of a nine-pin. As these muscles thus contract, they must necessarily draw the two bones, into which they are inserted, their own way: the hamstring, when it contracts, for instance, draws the leg backward toward the thigh; when we want to make the limb straight, there are muscles inserted under the fore-part of the knee, that, contracting, answer this purpose; while, in the mean time, the hamstring suffers itself to be relaxed, in order to let the opposing muscles take effect. This being understood, it will follow, that if we consider any one of the bones, the arm-bone for instance, as a beam, and the muscles that raise it and put it into motion, as the power that agitates and works the instrument, the whole will give us the idea of the third kind of lever, where the prop is at one end, the weight to be sustained at the other, and the strength is applied between them both. Thus, for instance, if you stretch out your arm, the prop is in the joint of the shoulder, the weight is the hand, and the raising power is the muscles, which are fixed into the arm-bone near the shoulder, and go from thence to be inserted into the bones of the trunk of the body. Now the nearer the shoulder these muscles are inserted into the arm-bone, it is evident that the longer will be the lever against which they are to act, and consequently the greater will appear the weight which they are to sustain. To make this quite plain: Suppose a ladder were laid flat on the ground; and suppose that a person, standing at one end, take the nearest round of the ladder in both his hands, and thus, pulling back, attempt to raise the farthest end, keeping the nearest end still steady to the ground. Would not this require immense strength to effect? Pretty similar is the force that the muscles of the arm exert in raising the whole length of the arm, and the weight of the hand beside. They are inserted into the bone close to the shoulder, and support the whole length of the arm in the desired direction. But what is more, they do not only act upon the lever at so disadvantageous a distance, but also they act upon it in a direction the most oblique, and consequently at a greater disadvantage.

disadvantage still. Suppose one attempt to raise the distant end of the ladder by pulling the round nearest him; this, as was said, will be very disadvantageous: but suppose yet farther, that he should first lie upon his back, and then, by drawing the next round to him of the ladder, he should attempt to raise the distant end; the force that would be capable of effecting this, would be incredible. Yet in this very manner it is that the muscles of the shoulder act, in raising the arm. They are not only inserted at the greatest distance from the weight, but they exert their power the most obliquely. The force they exert in keeping the hand and arm extended is great; the force they exert in keeping it extended, while the hand holds a weight of about 20 pounds, is astonishing. Some say that these muscles, upon equal terms, would lift a weight 10,000 times greater. What has been here said of the muscles of the arm is true, in a greater or less degree, of all the muscles in the body; so that this natural machine, thus fashioned by the Great Workman, is infinitely more powerful than any artificial machine that man could form, tho' it took up four times the space.

The muscles, as we said, are supported by bones: these make altogether a single pillar or column, which, though not perfectly straight, but with about five different curvatures or bendings; yet, when perfectly balanced upon itself, will actually support weights that would surprize the inexperienced. La Hire and Desaguliers give us several accounts of the amazing weight some people have sustained, when they were able to fix the pillar of their bones directly beneath it. The latter tells of a German who shewed several feats of this kind at London, and who performed before the king and a part of the royal family. This man, being placed in a proper situation, with a belt which rested upon his head and shoulders, and which was fixed below to a cannon of 4000 weight, had the props which supported the cannon taken away, and by fixing the pillar of his bones immovably against the weight, supported it with seeming unconcern. There are few that have not seen those men, who, catching a horse by the tail, and placing themselves in direct opposition to the animal's motion, have thus stopped the horse, though whipped by his rider to proceed. In all such cases, the pillar of the bones is placed in direct opposition to the weight; they support each other, and are prevented from rubbing or cracking by elastic gristles fixed between each bone; these give way a little upon great pressure, and restore themselves almost instantly when that is removed. Besides these, there is a viscous or slimy liquor that is squeezed in, as if from a sponge, between every joint, and keeps these gristles smooth, moist, and pliant. By means of this fluid all the joints move easily, and obey the impulse of the muscles with greater dispatch. This fluid, and the gristles (or *cartilages*, as anatomists call them,) contribute not a little to the strength of the animal; they resist the burthen with an elastic force, and conform themselves to the inequality of the pressure. In old age both are diminished, the gristles become hard, and this liquor (which anatomists call the *synovia*) is squeezed out in less quantities. The man therefore, in old age, becomes more stiff and more weak, chiefly upon this account; though partly because his muscles become then also more rigid, hard,

and less fleshy, as it is usually called; as those who have eaten the flesh of old animals know. While we are at rest, this fluid or synovia above-mentioned oozes out between the joints, to fit them for the hour of action; when in exercise, the ends of the bones press against their gristles, and these are separated in some measure by the synovia or fluid; but there is still another liquor of an oily nature, which is pressed at the same time from a small fleshy sponge, placed in every joint; and this mixing with the synovia, makes all supple and fit for business. It was said, that the synovia or viscid liquor oozes out between the joints in the hour of rest; it is therefore in greatest quantity between them in the morning, after we have taken our rest the preceding night. So great is the quantity usually separated during sleep between the joints of the back-bone, that some men are an inch taller in the morning than at night; and all men are somewhat taller, as may be quickly found by any who choose to make the experiment upon themselves.

From what has been said it appears, that, in carrying large burdens, the whole art consists in keeping the column of the body as directly under the weight as possible, and the body as upright under the weight as we can. For if the centre of gravity in the burden, falls without this column, it will go near to fall: in fact, if the supporter were an inanimate machine, it would fall inevitably; but human power, in some measure, catches the centre while yet beginning to descend, and restores the balance which it had lost the moment before. A man balancing under a weight, resembles one of those people whom we usually see walking upon a wire: they totter from side to side, for a moment lose the centre of gravity; but by throwing it ward a limb, or distorting their bodies, they recover it again, to the great amusement of every spectator. It is thus that he who carries a weight is obliged to act; on whatever part of his body the weight is placed, he balances it by throwing as much of his column beneath the load as he can. Could the weight be laid and evenly balanced upon him, standing in his natural posture, he could, as we observed before, support an incredible burden; and though he could not move under what he could thus support, yet he could carry a much greater load than if the burden were laid in any other manner. The weight a man could support, when thus evenly laid upon his shoulders, would break the back of the strongest horse in the world. The reason is obvious. In a man, the whole column of bones supports the weight directly; in an horse, the weight is laid upon the column crosswise. The porters of Constantinople are known to carry each a weight of 900 pounds; they lean upon a staff while loaded, and are unloaded in the same manner. The porters of Marseilles in France are found to carry yet more; their manner is this: four of them carry the burden between them, each having a sort of hood that covers the temples and head down to the shoulders; to this are fastened the cords that support the frame or bier, on which the weight is laid. By this contrivance the whole column of the bones acts directly against the load, and an immense weight is thus sustained.

We now therefore at length see the reason why two men carrying a load between them, can sustain a greater weight than what either could separately carry, if



it were divided into two equal parts. The reason is, that two men can bear the load each more upright, and with the column of their bones more opposed against it.

As man bears a weight the better the more upright he stands against it, it must follow necessarily, that the more bendings he makes in supporting weights, the less will be his power. There are three principal bendings in the human column; the first at the hams, the second at the hips, and the third along the backbone, which resembles the oar in pliancy, though it be stronger than the oak. A man of ordinary stature and strength, upon an average, has been computed to weigh 160 pounds; he can support, as we said before, an immense weight if his column acts directly against it; if he bends a little at the hams, such a man may raise from the ground about 170 pounds, provided the weights are placed to the greatest advantage. If he bends at the hips and back, he will lift 30 pounds less. If a weight be placed upon his head, and he be put between the rounds of a ladder placed horizontally and breast-high, he can lift 30 pounds by the strength of the muscles of his shoulders and neck alone.

From this we see, that human strength is not the fourth part as great when the body is bent, as when it is upright. From this also we see, that if a man draws a load after him, as in that case all his muscles act in an oblique direction, he can exert but very little force, when compared to other animals. Delagulier pretends to say, that an horse can draw as much, upon an average, as five English workmen. The French writers say, Dr Barthes in particular, that an horse can draw as much as six Frenchmen, or seven Dutchmen; but if the load were to be placed upon the shoulders, two men will be found to be as strong as an horse. A London porter should carry 300 weight at the rate of three miles an hour; two chairmen carry 150 pounds each, and walk at the rate of four miles an hour: Whereas a travelling horse seldom carries above 200 weight; and a day's journey with such a load, would be apt to disqualify him from travelling the day following.

Man's greatest force, therefore, is directly upward; if he draws a load, he must act at a disadvantage. A man, however, when obliged to draw a load, a rolling stone for instance, hath two methods of doing this. He may either turn his back to the stone, and pushing the frame with his breast, thus go onward, while the stone rolls after; or he may turn his face to the stone, and go backward, drawing the stone with him. This last method may be the most inconvenient, but it gives the workman much the greatest share of power, and that for two reasons. In the first place, by inclining farther back, he can give a greater column of his body to the draught; and in the next place, a greater number of his muscles come into action; particularly the two great deltoid muscles of the arms, the force of which is very great. It is for this reason that men who row a boat, more usually draw the oar to them, than push it from them.

#### CHAP. V. *Of Wheel-Carriages.*

By what we have seen of man considered as a machine, it is easy to observe that his frame is not adapted to drawing carriages; while, on the contrary, in

that of an animal upon all fours, the column of whole bodies, and the situation of whole muscles, act almost directly upon bodies placed behind them, they are perfectly fitted by nature for this kind of service. Horses are usually employed in the draught in Britain; mules, oxen, sheep, and other animals, are sometimes used in other parts of the world. It might incur ridicule if we pretended to inform the learner that each of these will draw a weight or carriage in proportion as they are strong. But notwithstanding this is generally the case, yet we are going to mention what will seem a paradox; namely, that two horses may be found, one stronger than the other, and also better skilled in the draught, yet the weaker shall draw a weight with the very same carriage the stronger one could not remove! This will be effected, if the weakest horse be the heaviest; if he exceeds his antagonist more in weight than he is exceeded in strength. It is known, that the weight re-acts or pulls back the horse, as much as the horse acts upon the weight to pull it forward. Now the horse has two sources of power in drawing the weight along: his strength, which gives him velocity; and his weight, which added gives force; and it is evident that the horse which hath both in the greatest proportion, will draw the heaviest weights. If we should imagine both horses raising an equal weight from a deep pit, and this weight still increased, so as to overcome their strength, it is plain that the lightest horse would soonest be drawn in. We have several instances in ordinary practice, of the great benefit of increasing the horse's weight to promote his draught: for, in many places, horses employed in turning a mill have a small load laid upon their backs, which, though it takes away something from their velocity, adds to their weight, and consequently increases their force.

But supposing the strength, skill, and weight, of two horses to be the same, all the difference then in their drawing the same weights, will arise from the commodiousness of the machine in which they draw. If the load they are to drag after them be breast-high, they can draw it with much greater ease than if it lay along the ground. They can, for instance, draw much greater draughts, if the weights are laid upon a sledge as high as the horse's shoulders, than if the same weights were laid upon a low sledge on the ground. For, in the first case, the column of their bodies acts directly against the weight; in the latter, it acts obliquely; and we have shewn before, that the more directly this column can act, the greater is its force. Even in either going up-hill or down-hill, the sledge breast-high is more commodious than that laid low. For if the low sledge is dragged up an hill, it is plain, that it will be then lower, with respect to the horses, than it was before, and consequently they will be obliged to draw it more obliquely upwards than when they drew it along the plain. If, on the contrary, the low sledge is drawn down an hill, it will then be higher with respect to the horses than when on the plain, and therefore their power of drawing it will be greater; but, in going down an hill, its own gravity conspires with the draught, and will also help the load to descend, so that the horses in this case are permitted to exert their greatest power where there is the least necessity; they can draw the low sledge down-hill

with

with all their power, when, by the natural descending of the load, they are not permitted to exert it. This doctrine, however, simple as it is, is different from what is usually taught by mechanists upon this subject.

Sledges were probably the first machines used in carrying loads; we find them thus employed in Homer, we mean in the original, in conveying wood for the funeral pile of Patroclus. There are some countries also that preserve their use to this day. However, men early began to find how much more easily a machine could be drawn upon a rough road, that run upon wheels, than one that thus went with a sliding motion. And indeed, if all surfaces were smooth and even, bodies could be drawn with as much ease upon a sledge as upon wheels; and in Holland, Lapland, and other countries, they use sledges upon the smooth surface of the ice; for as every surface upon which we travel is usually rough, wheels have been made use of, which rub less against the inequalities than sledges would do. In fact, wheels would not turn at all upon ice, if it were perfectly smooth, for the cause of the wheels turning upon a common road is the obstacles it continually meets. For if we suppose the wheels to be lifted from the ground, and carried along in the air, the wheels in this case would not turn at all, for there would be nothing to put any part into motion rather than another; in the same manner, if they were carried along upon perfectly smooth ice, they would meet nothing to give a beginning to the circulatory motion, and all their parts would rest equally alike. But if we suppose the wheel drawn along a common road, then the parts will receive unequal obstructions, for it meets with obstacles that retard it at bottom: therefore the upper part of the wheel, which is not retarded, will move more swiftly than the lower part, which is; but this it cannot do, unless the wheel moves round. And thus it is that the obstacles in the rough road cause this circulatory motion in the wheel.

This rotation of the wheels about their axle very much diminishes that friction which always attends the weight's being drawn along upon a sledge; and this in so great a proportion, that, according to Helsham, a carriage drawn by four wheels, will be drawn with five times as small an effort as one that slides upon the same surface in a sledge. Still more to diminish the friction in wheel-carriages, an expedient hath been found out, whereby the axle, contrary to what is usual in most carriages, is made to turn round, and its gudgeons or ends, instead of pressing against the boxes as in common wheels, are made to bear on the circumference of moveable wheels; so that by this contrivance, a number of parts are made to roll one over the other, which slid before: such wheels, from their thus diminishing the friction, are called *friction-wheels*.

The structure of *wheel-carriages* is generally so well known, that it would be needless to describe them. And therefore we shall only point out some inconveniences attending the common method of placing the wheels and loading the waggons; and make an observation or two upon the advantages of the use of broad wheels.

In coaches, and all other four-wheeled carriages,

the fore-wheels are made of a less size than the hind ones; both on account of turning short, and to avoid cutting the braces: otherwise, the carriage would go much easier if the fore-wheels were as high as the hind ones; and the higher the better, because their motion would be so much the slower on their axles, and consequently the friction proportionably taken off. But carriers and coachmen give another reason for making the fore-wheels much lower than the hind-wheels; namely, that when they are so, the hind-wheels help to push on the fore ones: which is too unphilosophical and absurd to deserve a refutation; and yet, for their satisfaction, we shall shew by experiment that it has no existence but in their own imaginations.

It is plain that the small wheels must turn as much oftener round than the great ones, as their circumferences are less. And therefore, when the carriage is loaded equally heavy on both axles, the fore-axle must endure as much more friction, and consequently wear out as much sooner than the hind-axle, as the fore-wheels are less than the hind-ones. But the great misfortune is, that all the carriers to a man do obstinately persist, against the clearest reason and demonstration, in putting the heavier part of the load upon the fore-axle of the waggon; which not only makes the friction greater where it ought to be least, but also presses the fore-wheels deeper into the ground than the hind-wheels, notwithstanding the fore-wheels, being less than the hind ones, are with so much the greater difficulty drawn out of a hole or over an obstacle, even supposing the weights on their axles were equal. For the difficulty, with equal weights, will be as the depth of the hole or height of the obstacle is to the semidiameter of the wheel. Thus, if we suppose the small wheel CLXXXIII. D of the waggon AB to fall into a hole of the depth fig. 4. EF, which is equal to the semidiameter of the wheel, and the waggon to be drawn horizontally along; it is evident, that the point E of the small wheel will be drawn directly against the top of the hole; and therefore, all the power of horses and men will not be able to draw it out, unless the ground gives way before it. Whereas, if the hind-wheel C falls into such a hole, it sinks not near so deep in proportion to its semidiameter; and therefore the point G of the large wheel will not be drawn directly, but obliquely, against the top of the hole; and so will be easily got out of it. Add to this, that since a small wheel will often sink to the bottom of a hole, in which a great wheel will go but a very little way, the small wheels ought in all reason to be loaded with less weight than the great ones: and then the heavier part of the load would be less jolted upward and downward, and the horses tired so much the less, as their draught raised the load to less heights.

It is true, that when the waggon-road is much uphill, there may be danger in loading the hind part much heavier than the fore part; for then the weight would overhang the hind-axle, especially if the load be high, and endanger tilting up the fore-wheels from the ground. In this case, the safest way would be to load it equally heavy on both axles; and then as much more of the weight would be thrown upon the hind-axle than upon the fore one, as the ground rises from a level below the carriage. But as this seldom happens, and when it does a small temporary weight laid

upon the pole between the horses would overbalance the danger, and this weight might be thrown into the waggon when it comes to level ground; it is strange that an advantage so plain and obvious as would arise from loading the hind-wheels heaviest, should not be laid hold of, by complying with this method.

To confirm these reasonings by experiment, let a small model of a waggon be made, with its fore-wheels  $2\frac{1}{2}$  inches in diameter, and its hind-wheels  $4\frac{1}{2}$ ; the whole model weighing about 20 ounces. Let this little carriage be loaded any how with weights, and have a small cord tied to each of its ends, equally high from the ground it rests upon; and let it be drawn along a horizontal board, first by a weight in a scale hung to the cord at the fore-part; the cord going over a pulley at the end of the board to facilitate the draught, and the weight just sufficient to draw it along. Then turn the carriage, and hang the scale and weight to the hind-cord, and it will be found to move along with the same velocity as at first: which shews, that the power required to draw the carriage is all the same, whether the great or small wheels are foremost; and therefore the great wheels do not help in the least to push on the small wheels in the road.

Hang the scale to the fore-cord, and place the fore-wheels (which are the small ones) in two holes, cut three eight parts of an inch deep in the board; then put a weight of 32 ounces into the carriage over the fore-axle, and an equal weight over the hind-one: this done, put 44 ounces into the scale, which will be just sufficient to draw out the fore-wheels: but if this weight be taken out of the scale, and one of 16 ounces put into its place, if the hind-wheels are placed in the holes, the 16 ounce weight will draw them out; which is little more than a third part of what was necessary to draw out the fore-wheels. This shews, that the larger the wheels are, the less power will draw the carriage, especially on rough ground.

Put 64 ounces over the axle of the hind-wheels, and 32 over the axle of the fore-ones, in the carriage; and place the fore-wheels in the holes: then put 38 ounces into the scale, which will just draw out the fore-wheels; and when the hind-ones come to the hole, they will find but very little resistance, because they sink but a little way into it.

But shift the weights in the carriage, by putting the 32 ounces upon the hind-axle, and the 64 ounces upon the fore-one; and place the fore-wheels in the holes: then, if 76 ounces be put into the scale, it will be found no more than sufficient to draw out these wheels; which is double the power required to draw them out when the lighter part of the load was put upon them: which is a plain demonstration of the absurdity of putting the heaviest part of the load in the fore-part of the waggon.

Every one knows what an outcry was made by the generality, if not the whole body of the carriers, against the broad-wheel act; and how hard it was to persuade them to comply with it, even though the government allowed them to draw with more horses, and carry greater loads than usual. Their principal objection was, that as a broad wheel must touch the ground in a great many more points than a narrow wheel, the friction must of course be just so much the greater; and consequently, there must be so many more

horses than usual, to draw the waggon. It is believed that the majority of people were of the same opinion; not considering, that if the whole weight of the waggon and load in it bears upon a great many points, each sustains a proportionably less degree of weight and friction, than when it bears only upon a few points; so that what is wanting in one, is made up in the other; and therefore will be just equal under equal degrees of weight, as may be shewn by the following plain and easy experiment.

Let one end of a piece of packthread be fastened to a brick, and the other end to a common scale for holding weights: then, having laid the brick edgewise on a table, and let the scale hang under the edge of the table, put as much weight into the scale as will just draw the brick along the table. Then taking back the brick to its former place, lay it flat on the table, and leave it to be acted upon by the same weight in the scale as before, which will draw it along with the same ease as when it lay upon its edge. In the former case, the brick may be considered as a narrow wheel on the ground; and in the latter, as a broad wheel. And since the brick is drawn along with equal ease, whether its broad side or narrow edge touches the table, it shews that a broad wheel might be drawn along the ground with the same ease as a narrow one, (supposing them equally heavy), even though they should drag, and not roll, as they go along.

As narrow wheels are always sinking into the ground, especially when the heaviest part of the load lies upon them, they must be considered as going constantly up-hill, even on level ground; and their edges must sustain a great deal of friction by rubbing against the ruts made by them. But both these inconveniences are avoided by broad wheels; which, instead of cutting and ploughing up the roads, roll them smooth, and harden them; as experience testifies in places where they have been used, especially either on wet and sandy ground: though, after all, it must be confessed, that they will not do in stiff clayey cross-roads; because they would soon gather up as much cal as would be almost equal to the weight of an ordinary load.

If the wheels are always to go upon smooth and level ground, the best way would be to make the spokes perpendicular to the naves; that is, to stand at right angles to the axles; because they would then bear the weight of the load perpendicularly, which is the strongest way for wood. But because the ground is generally uneven, one wheel often falls into a cavity or rut when the other does not, and then it bears much more of the weight than the other does: in which case, concave or dishing wheels are best; because when one falls into a rut, and the other keeps upon high ground, the spokes become perpendicular in the rut, and therefore have the greatest strength when the obliquity of the load throws most of its weight upon them; whilst those on the high ground have less weight to bear, and therefore need not be at their full strength. So that the usual way of making the wheels concave is by much the best.

The axles of the wheels ought to be perfectly straight, that the rims of the wheels may be parallel to each other; for then they will move easiest, because they will be at liberty to go on straight forwards. But, in the usual way of practice, the axles are bent down-  
ward



Plate  
LXXIII.  
Fig. 5.

ward at their ends; which brings the sides of the wheels next the ground nearer to one another than their opposite or higher sides are: and this not only makes the wheels to drag sidewise as they go along, and gives the load a much greater power of crushing them than when they are parallel to each other, but also endangers the over-turning of the carriage when any wheel falls into a hole or rut; or when the carriage goes in a road which has one side lower than the other, as along the side of a hill. Thus (in the hind-view of a wagon or cart) let AE and BF be the great wheels parallel to each other, on their straight axle K, and HCI the carriage loaded with heavy goods from C to G. Then, as the carriage goes on in the oblique road AaB, the centre of gravity of the whole machine and load will be at C; and the line of direction CdD falling within the wheel BF, the carriage will not overset. But if the wheels be inclined to each other on the ground, as AE and BF are, and the machine be loaded as before, from C to G, the line of direction CdD falls without the wheel BF, and the whole machine tumbles over. When it is loaded with heavy goods (such as lead or iron) which lie low, it may travel safely upon an oblique road so long as the centre of gravity is at C, and the line of direction Cd falls within the wheels; but if it be loaded high with lighter goods (such as wool-packs) from C to L, the centre of gravity is raised from C to K, which throws the line of direction Kk without the lowest edge of the wheel BF, and then the load oversets the wagon.

Fig. 6.

Fig. 5.

Fig. 7.

If there be some advantage from small fore-wheels, on account of the carriage turning more easily and short than it can be made to do when they are large; there is at least as great a disadvantage attending them, which is, that as their axle is below the level of the horses' breasts, the horses not only have the loaded carriage to draw along, but also part of its weight to bear; which tires them sooner, and makes them grow much stiffer in their hams, than they would be if they drew on a level with the fore-axle: and for this reason we find coach-horses soon become unfit for riding. So that on all accounts it is plain, that the fore-wheels of all carriages ought to be so high as to have their axles even with the breast of the horses; which would not only give the horses a fair draught, but likewise cause the machine to be drawn by a less degree of power.

60  
A carriage  
to go with-  
out any o-  
ther force  
than what  
it receives  
from the  
passengers.  
Plate  
CLXXIV.  
Fig. 1.

By means of wheels, some people have contrived carriages to go without horses, or any other moving power than what was given by the passengers, by the wind, &c. One of these is represented by AECD. It is moved by the footman behind it; and the fore-wheels, which act as a rudder, are guided by the person who sits in the carriage (A).

Between the hind-wheels is placed a box, in which is concealed the machinery that moves the carriage. AA, (fig. 2.) is a small axis fixed into the box. B is a pulley, over which runs a rope, whose two ends are fastened to the ends of the two levers or treddles CD, whose other ends are fixed in such manner in the piece E, which is joined to the box, that they can easily move up and down. F, F, are two flat pieces of iron that are joined to the treddles, and take the teeth of

the two wheels H, H, which are fixed on the same axis with the hind-wheels of the carriage, I, I.

It is evident, that when the footman behind presses down one of the treddles, suppose C, with his foot, he must bring down one of the pieces of iron F, and consequently turn the wheel H that is next to it; and at the same time, by means of the rope that goes over the pulley, he must raise the other treddle D, together with its piece F, which being thrust down will turn the other wheel H; and so alternately: and as the great wheels are fixed on the same axis, they must necessarily move at the same time.

It is easy to conceive, that if the ends of the treddles next E, instead of being placed behind the carriage, were turned the opposite way, so as to come under the feet of the person who sits in it, he might move it with equal, or even greater facility, than the footman, as it would then be charged with the weight of one person only.

A machine of this kind will afford a salutary recreation in a garden or park, or on any plain ground; but in a rough or deep road must be attended with more pain than pleasure.

Another contrivance for being carried without draught, is by means of a sailing chariot, or boat fixed on four wheels, as AB; which is driven before the wind by the sails CD, and guided by the rudder E. In a chariot of this kind, the wheels should be farther asunder, and the axle-trees longer, than in other carriages, to prevent overturning.

A machine of this sort was constructed in the last century by Stephinus, at Scheveling in Holland, and is celebrated by many writers. Its velocity with a strong wind is said to be so great, that it would carry eight or ten persons from Scheveling to Putten, which are 42 English miles distant, in two hours.

Carriages of this kind are said to be frequent in China; and in any wide, level country, must be, sometimes, both pleasant and profitable. The great inconvenience attending this machine is, that it can only go in the direction the wind blows, and even not then unless it blow strong; so that, after you have got some way on your journey, if the wind should fail, or change, you must either proceed on foot, or go back. Some remedy for this inconvenience will be found in the next contrivance. The Hollanders have, or had, small vessels, something of this kind, that carry one or two persons on the ice, having a sledge at bottom instead of wheels; and being made in the form of a boat, if the ice break the passengers are secured from drowning.

To sail against the wind: Let ABCD be the body of a sailing chariot; M the mast, to which are fixed the wings or sails EFGH; the two first of which, EF, are here supposed to be expanded by the wind; R is the rudder by which it is guided. Therefore, the wind driving the sails round, with the mast M, and the cog-wheel K, take the teeth, placed perpendicular to the sides of the two fore-wheels of the carriage, and consequently keep it in continual motion.

The body of this machine should not be large, nor placed very high, not only to prevent overturning, but that its motion may not be thereby impeded; for

(A) This machine was invented by M. Richard, a physician of Rochelle, and was exhibited at Paris in the last century. It is described by M. Ozanam in his *Recreations Mathematiques*.

the velocity will be in proportion to the force of the wind on the sails, to that on the body of the machine. Therefore, if they be both equal, it will stand still; or if the force on the body be greatest, it will go backwards; unless there be a contrivance to lock the wheels. The upper part of the machine next *A*, may be made to take off when the wind is contrary, and there may be another set of sails placed between the two hind-wheels, which will considerably increase its velocity. But after all, for general use, a common carriage must be preferable: for this cannot be expected to go up a moderate ascent without great difficulty; nor down a declivity, when there is a strong wind, without danger; and even on level ground, if the road be in any degree rough, its progress must be very slow, attended both with difficulty and danger. In an open country, however, where there is a large tract of level and smooth ground, and frequent strong winds, a machine of this sort will certainly be very convenient; and in most countries, when made of a small size, may be useful to young people, by affording them a pleasant and healthful exercise.

63.  
The un-  
vertible car-  
riage.  
Plate  
CLXXIV.  
fig. 5.

A carriage the body of which is incapable of being overturned may be made as follows. The body must consist of a regular hollow globe, as *AB*, at the bottom of which is to be an immovable weight, and which must be proportioned to the number of persons or the load the machine is intended to carry. Round the globe must go two horizontal iron circles *D*, *E*, and two others *F*, *G*, that are perpendicular to the former. All these circles must be made exactly to fit the globe, that it may move freely in every direction. The two horizontal circles are to be joined on each side by a perpendicular bar, one of which is expressed in the figure by *HI*. All these irons should be lined with leather, to prevent unnecessary friction. The body of the carriage may be either of leather or hard wood; but the latter will be most eligible, as least liable to wear. The wheel on each side is to be fastened to the perpendicular bar by means of a handle *K*, that keeps it steady.

Now, the body of this machine moving freely in the iron circles every way, the centre of gravity will always lie at *C*; therefore, in whatever position the wheels are, or even if they overturn, the body of the carriage will constantly remain in the same perpendicular direction.

At *L* is placed a pin, round which is a hollow moveable cylinder: this pin moves up and down in the groove *MN*, that it may not impede the perpendicular motion of the circles, at the same time that it prevents the body of the machine from turning round in a horizontal direction. *O* is one of the windows, *P* the door, and *QR* the shafts to this machine.

When a carriage of this sort is intended for a single person, or a light weight, it may be hung on swivels, in the same manner as the rolling lamp or the sea-compass, which will make its horizontal motion still more regular: and when it is designed to carry several persons, by adding another perpendicular bar on each side, between the two horizontal circles, it may be placed on four wheels. The body of this machine should be frequently oiled or greased, not only to prevent any disagreeable noise that may arise from its rubbing

against the circles, but to prevent unnecessary wear in the several parts.

This carriage is not intended for smooth roads, or a regular pavement; there certainly, those of the common construction are much preferable; nor should a carriage totally free from irregular motion be sought after by those who are in perfect health: but there are many persons, subject to different disorders, who by being obliged to travel over rough roads in the common carriages, suffer tortures of which the healthful have no idea; to all these, therefore, and to every one who is forced to travel through dangerous roads, a carriage of this sort must doubtless be highly desirable.

As this design may appear to some persons, on a superficial view, impracticable, we shall here insert an account of a similar carriage, which we have taken from the first volume of the abridgment of the Philosophical Transactions, by Lowthorp. There is not, however, any description of the manner in which that machine was constructed. The account is as follows: "A new sort of calash described by Sir R. B. This calash goes on two wheels; carries one person; is light enough. Though it hangs not on braces, yet it is easier than the common coach. A common coach will overturn if one wheel go on a superficies a foot and a half higher than the other; but this will admit of the difference of three feet and one-third in height of the superficies, without danger of overturning. We chose all the irregular banks, and sides of ditches, to run over; and I have this day seen it, at five several times, turn over and over, and the horse not at all disordered. If the horse should be in the least unwell, with the help of one pin you disengage him from the calash without any inconvenience (*a contrivance of this sort may be easily added to the foregoing design.*) I myself have been once overturned, and knew it not till I looked up and saw the wheel flat over my head: and if a man went with his eyes shut, he would imagine himself in the most smooth way, though at the same time there be three feet difference in the height of the ground of each wheel."

#### CHAP. VI. Of Mills and Cranes.

In a common *breast-mill*, where the fall of water may be about ten feet, *AA* is the great wheel, which is generally about 17 or 18 feet in diameter, reckoned from the outermost edge of any float-board at *a* to that of its opposite float at *b*. To this wheel the water is conveyed thro' a channel; and by falling upon the wheel, turns it round. [64] 65  
A common  
Plate  
CLXXII  
fig. 9.

On the axis *BB* of this wheel, and within the mill-house, is a wheel *D*, about 8 or 9 feet diameter, having 61 cogs, which turn a trundle *E* containing ten upright flaves or rounds; and when these are the number of cogs and rounds, the trundle will make 61 revolutions for one revolution of the wheel.

The trundle is fixed upon a strong iron axis called the spindle, the lower end of which turns in a brass foot, fixed at *F*, in the horizontal beam *ST* called the *bridge-tree*; and the upper part of the spindle turns in a wooden bush fixed into the nether-millstone which lies upon beams in the floor *YY*. The top part of the spindle above the bush is square, and goes into a square hole in a strong iron cross *a b c d* (see fig.

fig. 10.) called the *rynd*; under which, and close to the bush, is a round piece of thick leather upon the spindle, which it turns round at the same time that it does the rynd.

The rynd is let into grooves in the under surface of the running millstone G (fig. 9.), and so turns it round in the same time that the trundle E is turned round by the cog-wheel D. This millstone has a large hole quite through its middle, called the *eye of the stone*, through which the middle part of the rynd and upper end of the spindle may be seen; whilst the four ends of the rynd lie hid below the stone in their grooves.

The end T of the bridge-tree TS (which supports the upper millstone G upon the spindle) is fixed into a hole in the wall; and the end S is let into a beam QR called the *brayer*, whose end R remains fixed in a mortise; and its other end Q hangs by a strong iron-rod P, which goes through the floor YY, and has a screw-nut on its top at O; by the turning of which nut, the end Q of the brayer is raised or depressed at pleasure, and consequently the bridge-tree TS and upper millstone. By this means, the upper millstone may be set as close to the under one, or raised as high from it, as the miller pleases. The nearer the millstones are to one another, the finer they grind the corn; and the more remote from one another, the coarser.

The upper millstone G is inclosed in a round box H, which does not touch it any where; and is about an inch distant from its edge all around. On the top of this box stands a frame for holding the hopper *h h*, to which is hung the shoe, I, by two lines fastened to the hind-part of it, fixed upon hooks in the hopper, and by one end of the crook-string K fastened to the fore-part of it at *i*, the other end being twisted round the pin L. As the pin is turned one way, the string draws up the shoe closer to the hopper, and so lessens the aperture between them; and as the pin is turned the other way, it lets down the shoe, and enlarges the aperture.

If the shoe be drawn up quite to the hopper, no corn can fall from the hopper into the mill: if it be let a little down, some will fall; and the quantity will be more or less, according as the shoe is more or less let down. For the hopper is open at bottom, and there is a hole in the bottom of the shoe, not directly under the bottom of the hopper, but forwarder towards the end *i*, over the middle of the eye of the millstone.

There is a square hole in the top of the spindle, in which is put the feeder *e* (fig. 10.) This feeder (as the spindle turns round) jogs the shoe three times in each revolution, and so causes the corn to run constantly down from the hopper, through the shoe, into the eye of the millstone, where it falls upon the top of the rynd, and is, by the motion of the rynd and the leather under it, thrown below the upper stone, and ground between it and the lower one. The violent motion of the stone creates a centrifugal force in the corn going round with it, by which means it gets farther and farther from the centre, as in a spiral, in every revolution until it be thrown quite out; and, being then ground, it falls thro' a spout M, called the *mill-eye*, into the trough N.

When the mill is fed too fast, the corn bears up the stone, and is ground too coarse; and besides, it clogs the mill so as to make it go too slow. When the mill is too slowly fed, it goes too fast, and the stones by their attrition are apt to strike fire against one another: Both which inconveniences are avoided by turning the pin L backward or forwards, which draws up or lets down the shoe, and so regulates the feeding as the miller sees convenient.

The heavier the running millstone is, and the greater the quantity of water that falls upon the wheel, so much the faster will the mill bear to be fed, and consequently so much the more it will grind. And on the contrary, the lighter the stone, and the less the quantity of water, so much slower must the feeding be. But when the stone is considerably wore, and become light, the mill must be fed slowly at any rate; otherwise the stone will be too much borne up by the corn under it, which will make the meal coarse.

The quantity of power required to turn a heavy millstone is but a very little more than what is sufficient to turn a light one: for as it is supported upon the spindle by the bridge-tree ST, and the end of the spindle that turns in the brags foot therein being but small, the odds arising from the weight is but very inconsiderable in its action against the power or force of the water. And besides, a heavy stone has the same advantage as a heavy fly; namely, that it regulates the motion much better than a light one.

In order to cut and grind the corn, both the upper and under millstones have channels or furrows cut into them, proceeding obliquely from the centre towards the circumference. And these furrows are each cut perpendicularly on one side and obliquely on the other into the stone, which gives each furrow a sharp edge, and in the two stones they come as it were against one another like the edges of a pair of scissars; and so cut the corn, to make it grind the easier when it falls upon the places between the furrows. These are cut the same way in both stones when they lie upon their backs, which makes them run cross-ways to each other when the upper stone is inverted by turning its furrowed surface towards that of the lower. For, if the furrows of both stones lay the same way, a great deal of the corn would be driven onward in the lower furrows, and so come out from between the stones without ever being cut.

When the furrows become blunt and shallow by wearing, the running stone must be taken up, and both stones new dressed with a chisel and hammer. And every time the stone is taken up, there must be some tallow put round the spindle upon the bush, which will soon be melted by the heat the spindle acquires from its turning and rubbing against the bush, and so will get in betwixt them: otherwise the bush would take fire in a very little time.

The bush must embrace the spindle quite close, to prevent any shake in the motion; which would make some parts of the stones grate and fire against each other, whilst other parts of them would be too far asunder, and by that means spoil the meal in grinding.

Whenever the spindle wears the bush so as to begin to shake in it, the stone must be taken up, and a chisel drove into several parts of the bush; and when it



is taken out, wooden wedges must be driven into the holes; by which means the bush will be made to embrace the spindle close all around it again. In doing this, great care must be taken to drive equal wedges into the bush on opposite sides of the spindle; otherwise it will be thrown out of the perpendicular, and so hinder the upper stone from being set parallel to the under one, which is absolutely necessary for making good work. When any accident of this kind happens, the perpendicular position of the spindle must be restored by adjusting the bridge-tree ST by proper wedges put between it and the brayer QR.

It often happens, that the rynd is a little wrenched in laying down the upper stone upon it; or is made to sink a little lower upon one side of the spindle than on the other: and this will cause one edge of the upper stone to drag all around upon the other, whilst the opposite edge will not touch. But this is easily set to rights, by raising the stone a little with a lever, and putting bits of paper, cards, or thin clips, betwixt the rynd and the stone.

The diameter of the upper stone is generally about six feet, the lower stone about an inch more: and the upper stone when new contains about  $22\frac{1}{2}$  cubic feet, which weighs somewhat more than 1900 pounds. A stone of this diameter ought never to go more than 60 turns round in a minute; for if it turns faster, it will heat the meal.

The grinding surface of the under stone is a little convex from the edge to the centre, and that of the upper stone a little more concave: so that they are farthest from one another in the middle, and come gradually nearer towards the edges. By this means, the corn at its first entrance between the stones is only bruised; but as it goes farther on towards the circumference or edge, it is cut smaller and smaller; and at last finely ground just before it comes out from between them.

The water-wheel must not be too large, for if it be, its motion will be too slow; nor too little, for then it will want power. And for a mill to be in perfection, the floats of the wheel ought to move with a third part of the velocity of the water, and the stone to turn round once in a second of time.

Such a mill as this, with a fall of water about 7 $\frac{1}{2}$  feet, will require about 32 hogheads every minute to turn the wheel with a third part of the velocity with which the water falls; and to overcome the resistance arising from the friction of the geers and attrition of the stones in grinding the corn.

The greater fall the water has, the less quantity of it will serve to turn the mill. The water is kept up in the mill-dam, and let out by a sluice called the *penstock*, when the mill is to go. When the penstock is drawn up by means of a lever, it opens a passage thro' which the water flows to the wheel: and when the mill is to be stopp'd, the penstock is let down, which stops the water from falling upon the wheel.

A less quantity of water will turn an overshot-mill (where the wheel has buckets instead of float-boards), than a breast-mill, where the fall of the water seldom exceeds half the height AB of the wheel. So that, where there is but a small quantity of water, and a bucket great enough for the wheel to lie under it, the bucket (or overshot) wheel is always used. But where there

is a large body of water, with a little fall, the breast or float-board wheel must take place. Where the water runs only upon a little declivity, it can act but slowly upon the under part of the wheel at *b*; in which case, the motion of the wheel will be very slow: and therefore, the floats ought to be very long, tho' not high, that a large body of water may act upon them; so that what is wanting in velocity may be made up in power: and then the cog-wheel may have a greater number of cogs in proportion to the rounds in the trundle, in order to give the millstone a sufficient degree of velocity.

They who recollect what has been said concerning the acceleration of bodies falling freely by the power of gravity acting constantly and uniformly upon them, may perhaps ask, Why should the motion of the wheel be equable, and not accelerated, since the water acts constantly and uniformly upon it? The plain answer is, that the velocity of the wheel can never be so great as the velocity of the water that turns it; for, if it should become so great, the power of the water would be quite lost upon the wheel, and then there would be no proper force to overcome the friction of the geers and attrition of the stones. Therefore, the velocity with which the wheel begins to move, will increase no longer than till its momentum or force is balanced by the resistance of the machine; and then the wheel will go on with an equable motion.

[If the cog-wheel D be made about 18 inches dia-<sup>66</sup> A hand-meter, with 30 cogs, the trundle as small in proportion, with 10 staves, and the millstones be each about two feet in diameter, and the whole work be put into a strong frame of wood, as represented in the figure, the engine will be a hand-mill for grinding corn or malt in private families. And then, it may be turned by a winch instead of the wheel AA; the millstone making three revolutions for every one of the winch. If a heavy fly be put upon the axle B, near the winch, it will help to regulate the motion.]

If the cogs of the wheel and rounds of the trundle could be put in as exactly as the teeth are cut in the wheels and pinions of a clock, then the trundle might divide the wheel exactly: that is to say, the trundle might make a given number of revolutions for one of the wheel, without a fraction. But as any exact number is not necessary in mill-work, and the cogs and rounds cannot be set in so truly as to make all the intervals between them equal; a skilful mill-wright will always give the wheel what he calls a *hunting cog*; that is, one more than what will answer to an exact division of the wheel by the trundle. And then, as every cog comes to the trundle, it will take the next staff or round behind the one which it took in the former revolution: and by that means will wear all the parts of the cogs and rounds which work upon one another equally, and to equal distances from one another, in a little time; and so make a true uniform motion throughout the whole work. Thus, in the above water-mill, the trundle has 10 staves, and the wheel 61 cogs.

Sometimes, where there is a sufficient quantity of water, the cog-wheel AA turns a large trundle BB,<sup>Plate</sup> on whose axis C is fixed the horizontal wheel D, with cogs all round its edge, turning two trundles E and<sup>CLXXXI</sup>  
<sup>fig. 1.</sup>

F at the same time; whose axes or spindles G and H turn two millstones I and K, upon the fixed stones L and M. And when there is not work for them both, either may be made to lie quiet, by taking out one of the flaves of its trundle, and turning the vacant place towards the cog-wheel D. And there may be a wheel fixed on the upper end of the great upright axle C for turning a couple of boulting-mills; and other work for drawing up the sacks, fanning and cleaning the corn, sharpening of tools, &c.

If, instead of the cog-wheel AA and trundle BB, horizontal levers be fixed into the axle C below the wheel D, then horses may be put to these levers for turning the mill: which is often done where water cannot be had for that purpose.

The working parts of a wind-mill differ very little from those of a water-wheel: only the former is turned by the action of the wind upon four sails, every one of which ought (as is generally believed) to make an angle of  $54\frac{1}{2}$  degrees with a plane perpendicular to the axis on which the arms are fixed for carrying them; it being demonstrable, that when the sails are set to such an angle, and the axis turned end-ways toward the wind, the wind has the greatest power upon the sails. But this angle answers only to the case of a vane or sail just beginning to move: for, when the vane has a certain degree of motion, it yields to the wind; and then that angle must be increased to give the wind its full effect.

Again, the increase of this angle should be different, according to the different velocities from the axis to the extremity of the vane. At the axis it should be  $54\frac{1}{2}$  degrees, and thence continually increase, giving the vane a twist, and so causing all the ribs of the vane to lie in different planes.

Lastly, these ribs ought to decrease in length from the axis to the extremity, giving the vane a curvilinear form; so that no part of the force of any one rib be spent upon the rest, but all move on independent of each other. All this is required to give the sails of a wind-mill their true form: and we see both the twist and the diminution of the ribs exemplified in the wings of birds.

It is almost incredible to think with what velocity the tips of the sails move when acted upon by a moderate gale of wind. We have several times counted the number of revolutions made by the sails in 10 or 15 minutes; and from the length of the arms from tip to tip, have computed, that if a hoop of that diameter was to run upon the ground with the same velocity that it would move if put upon the sail-arms, it would go upwards of 30 miles in an hour.

As the ends of the sails nearest the axis cannot move with the same velocity that the tips or farthest ends do, although the wind acts equally strong upon them; perhaps a better position than that of stretching them along the arms directly from the centre of motion, might be to have them set perpendicularly across the farther ends of the arms, and there adjusted lengthwise to the proper angle. For, in that case, both ends of the sails would move with the same velocity; and being farther from the centre of motion, they would have so much the more power: and then, there would be no occasion for having them so large as they are generally made; which would render them lighter, and

consequently, there would be so much the less friction on the thick neck of the axle where it turns in the wall.

A crane is an engine by which great weights are raised to certain heights, or let down to certain depths. It consists of wheels, axles, pulleys, ropes, and a gib or gibbet. When the rope H is hooked to the weight K, a man turns the winch A, on the axis whereof is the trundle B, which turns the wheel C, on whose axis D is the trundle E which turns the wheel F with its upright axis G, on which the great rope HH winds as the wheel turns; and going over a pulley, I, at the end of the arm *d* of the gib *cde*, it draws up the heavy burden K; which being raised to a proper height, as from a ship to the quay, is then brought over the quay by pulling the wheel Z round by the handles *z, z*, which turns the gib by means of the half wheel *b* fix on the gib-post *cc*, and the strong pinion *a* fix on the axis of the wheel Z. This wheel gives the man that turns it an absolute command over the gib, so as to prevent it from taking any unlucky swing, such as often happens when it is only guided by a rope tied to its arm *d*; and people are frequently hurt, sometimes killed, by such accidents.

The great rope goes between two upright rollers *i* and *k*, which turn upon gudgeons in the fixed beams *f* and *g*; and as the gib is turned towards either side, the rope bends upon the roller next that side. Were it not for these rollers, the gib would be quite unmanageable; for the moment it were turned over so little towards any side, the weight K would begin to descend, because the rope would be shortened between the pulley I and axis G; and so the gib would be pulled violently to that side, and either be broken to pieces, or break every thing that came in its way. These rollers must be placed so that the sides of them round which the rope bends may keep the middle of the bended part directly even with the centre of the hole in which the upper gudgeon of the gib turns in the beam *f*. The truer these rollers are placed, the easier the gib is managed, and the less apt to swing either way by the force of the weight K.

A ratchet-wheel Q is fixt upon the axis D, near the trundle E; and into this wheel falls the catch or click R. This hinders the machine from running back by the weight of the burden K, if the man who raises it should happen to be careless, and so leave off working at the winch A sooner than he ought to do.

When the burden K is raised to its proper height from the ship, and brought over the quay by turning the gib about, it is let down gently upon the quay, or into a cart standing thereon, in the following manner: A man takes hold of the rope *tt* (which goes over the pulley *v*, and is tied to a hook at S in the catch R) and so disengages the catch from the ratchet-wheel Q; and then, the man at the winch A turns it backward, and lets down the weight K. But if the weight pulls too hard against this man, another lays hold of the handle V, and by pulling it downward draws the gripe U close to the wheel Y, which by rubbing hard against the gripe hinders the too quick descent of the weight; and not only so, but even stops it at any time if required. By this means, heavy goods may be either raised or let down at pleasure, without any danger of hurting the men who work the engine.

When part of the goods are craned up, and the rope is to be let down for more, the catch R is first disengaged from the ratchet-wheel Q, by pulling the cord *t*; then the handle *q* is turned half round backward, which, by the crank *nn* in the piece *a*, pulls down the frame *b* between the guides *m* and *m* (in which it slides in a groove) and so disengages the trundle B from the wheel C: and then, the heavy hook *β* at the end of the rope H descends by its own weight, and turns back the great wheel F with its trundle E and the wheel C; and this last wheel acts like a fly against the wheel F and hook *β*, and so hinders it from going down too quick; whilst the weight X keeps up the gripe U from rubbing against the wheel Y, by means of a cord going from the weight, over the pulley *w* to the hook W in the gripe; so that the gripe never touches the wheel, unless it be pulled down by the handle V.

When the crane is to be set at work again for drawing up another burden, the handle *q* is turned half round forwards; which, by the crank *nn*, raises up the frame *b*, and causes the trundle B to lay hold of the wheel C; and then, by turning the wheel A, the burden of goods K is drawn up as before.

The crank *nn* turns pretty stiff in the mortise near *o*, and stops against the farther end of it when it has got just a little beyond the perpendicular; so that it can never come back of itself: and therefore, the trundle B can never come away from the wheel C, until the handle *q* be turned half round.

The great rope runs upon rollers in the lever LM, which keep it from bending between the axle at G and the pulley I. This lever turns upon the axis N by means of the weight O, which is just sufficient to keep its end L up to the rope; so that, as the great axle turns, and the rope coils round it, the lever rises with the rope, and prevents the coilings from going over one another.

The power of this crane may be estimated thus: Suppose the trundle B to have 13 flaves or rounds, and the wheel C to have 78 spur-cogs; the trundle E to have 14 flaves, and the wheel F 56 cogs. Then, by multiplying the flaves of the trundles, 13 and 14, into one another, their product will be 182; and by multiplying the cogs of the wheels, 78 and 56, into one another, their product will be 4368; and dividing 4368 by 182, the quotient will be 24: which shews, that the winch A make 24 turns for one turn of the wheel F and its axle G on which the great rope or chain HIH winds. So that, if the length or radius of the winch A were only equal to half the diameter of the great axle G, added to half the thickness of the rope H, the power of the crane would be as 24 to 1: but the radius of the winch being double the above length, it doubles the said power, and so makes it as 48 to 1: in which case, a man may raise 48 times as much weight by this engine as he could do by his natural strength without it, making proper allowance for the friction of the working parts. Two men may work at once, by having another winch on the opposite end of the axis of the trundle under B; and so make the power still double.

If this power be thought greater than what may be generally wanted, the wheels may be made with more cogs in proportion to the flaves in the trundles; and

so the power may be of whatever degree is judged to be requisite. But if the weight be so great as will require yet more power to raise it (suppose a double quantity), then the rope H may be put under a moveable pulley, as *s*, and the end of it tied to a hook in the gib at *t*; which will give a double power to the machine, and so raise a double weight hooked to the block of the moveable pulley.

When only small burdens are so raised, this may be quickly done by men pushing the axle G round by the handspokes *y, y, y, y*; having first disengaged the trundle B from the wheel C: and then, this wheel will only act as a fly upon the wheel F; and the catch R will prevent its running back, if the men should inadvertently leave off pushing before the burden be unhooked from *β*.

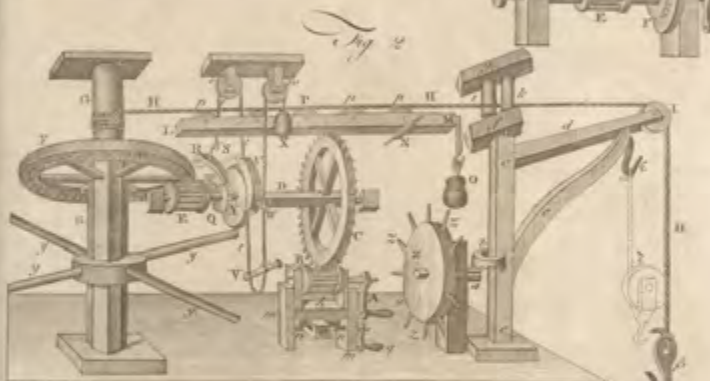
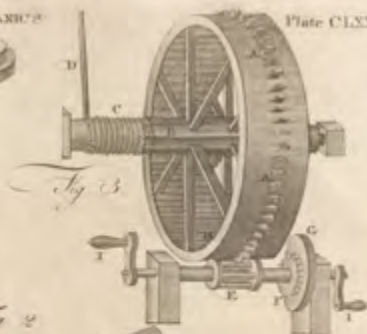
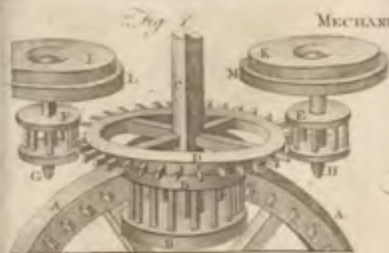
Lastly, when very heavy burdens are to be raised, which might endanger the breaking of the cogs in the wheel F; their force against these cogs may be much abated by men pushing round the handspokes *y, y, y, y*, whilst the man at A turns the winch.

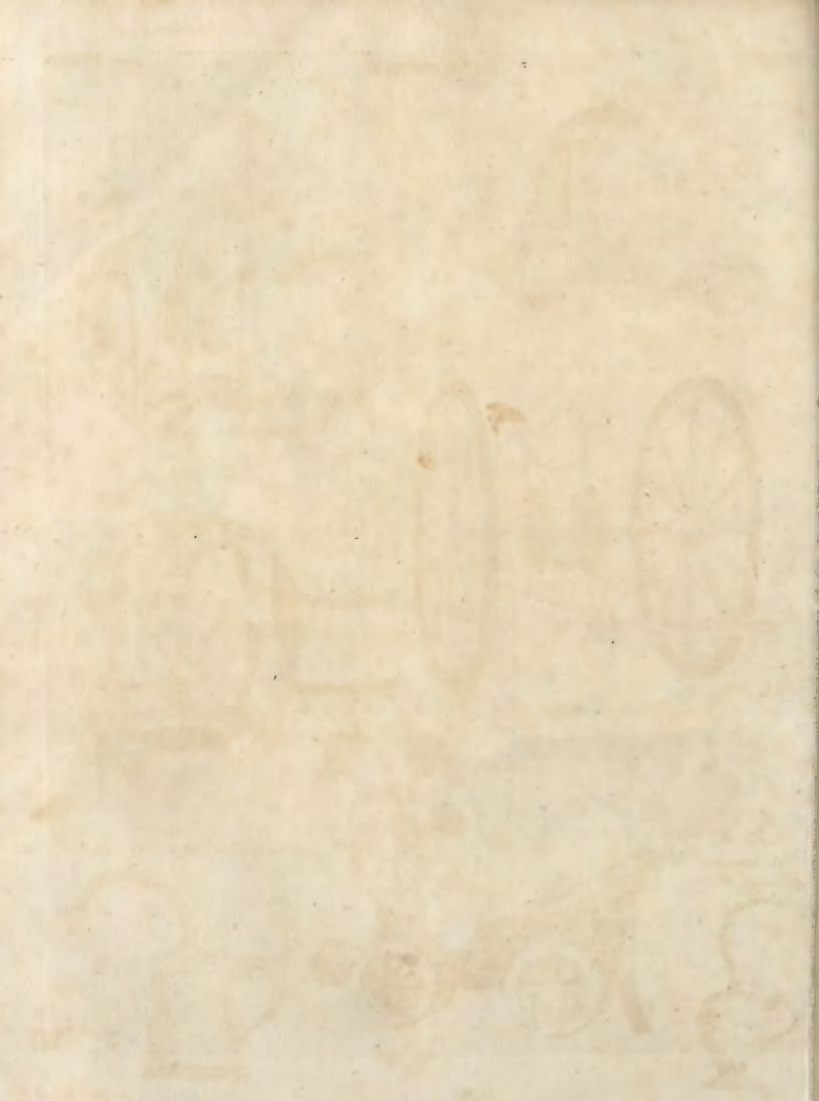
We have only shewn the working parts of this crane, without the whole of the beams which support them; knowing that these are easily supposed, and that if they had been drawn, they would have hid a great deal of the working parts from sight, and also confused the figure.

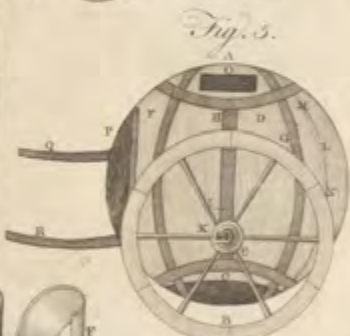
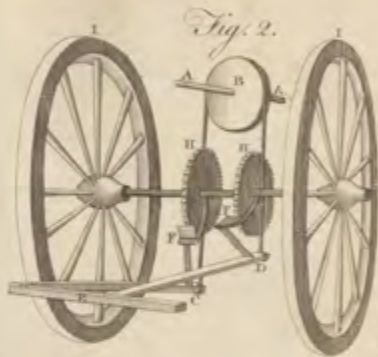
Another very good crane is made in the following manner. AA is a great wheel turned by men walking within it at H. On the part C, of its axle BC, the great rope D is wound as the wheel turns; and this rope draws up goods in the same way as the rope HH does in the above-mentioned crane, the gib-work here being supposed to be of the same fort. But these cranes are very dangerous to the men in the wheel; for, if any of the men should chance to fall, the burden will make the wheel run back and throw them all about within it; which often breaks their limbs, and sometimes kills them. The late ingenious Mr Padmore of Bristol, (whose contrivance the forementioned crane is), observing this dangerous construction, contrived a method for remedying it, by putting cogs all around the outside of the wheel, and applying a trundle E to turn it; which increases the power as much as the number of cogs in the wheel is greater than the number of flaves in the trundle: and by putting a ratchet-wheel F on the axis of the trundle, (as in the above-mentioned crane), with a catch to fall into it, the great wheel is kept from running back by the force of the weight, even if all the men in it should leave off walking. And by one man working at the winch E, or two men at the opposite winches when needful, the men in the wheel are much assisted, and much greater weights are raised, than could be by men only within the wheel. Mr Padmore put also a gripe-wheel G upon the axis of the trundle, which being pinched in the same manner as described in the former crane, heavy burdens may be let down without the least danger. And before this contrivance, the lowering of goods was always attended with the utmost danger to the men in the wheel; as every one must be sensible of who has seen such engines at work. And it is surprising that the masters of wharfs and cranes should be so regardless of the limbs, or even lives of their workmen, that, excepting the late Sir James Creed of Greenwich,

70  
Another  
crane.  
Plate  
CLXXII  
fig. 3.









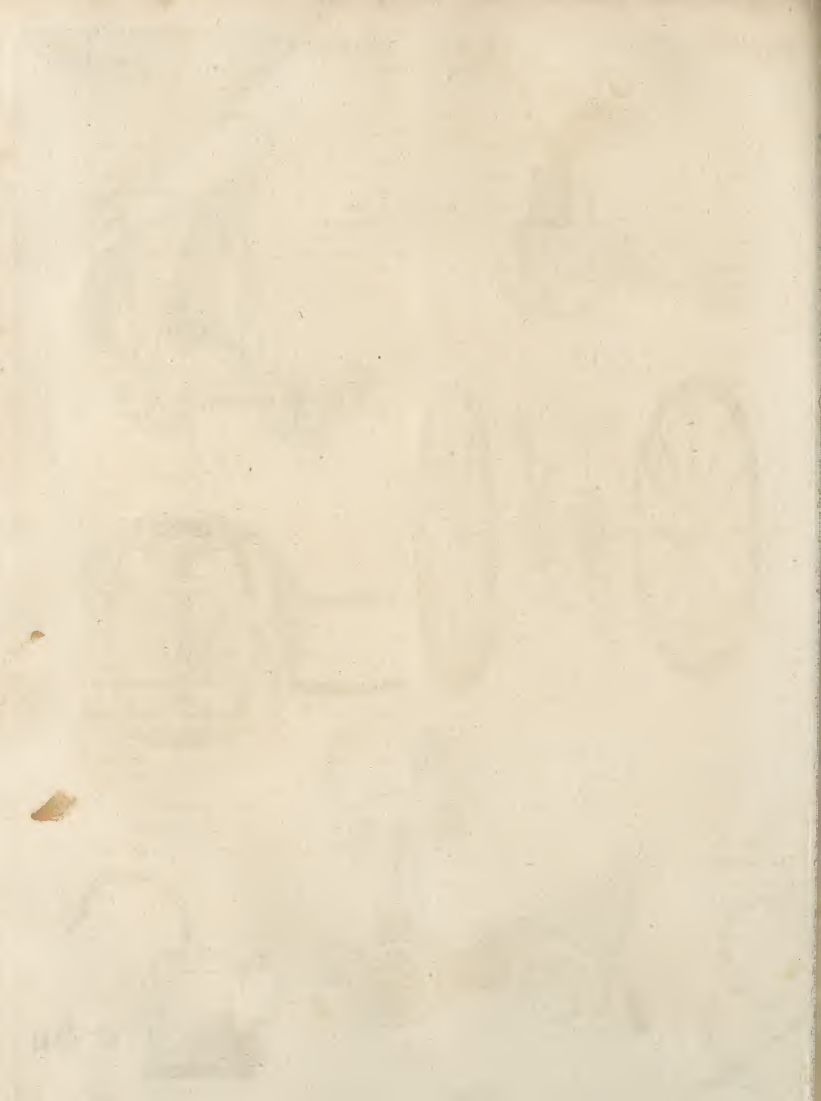
*Fig. 6.*  
The INHALER.  
Improved by M. Aithen



*Fig. 5.*  
The INHALER.  
See that Article and the Index subjoid to Medicine







wich, and some gentlemen at Bristol, there is scarce an instance of any who has used this safe contrivance.

### CHAP. VII. Of the Communication of Motion.

BEFORE we proceed to explain the laws by which bodies communicate their motion from one to another, it is very necessary to make a distinction between motion and velocity; which ought to be well observed, and is as follows.

By the motion of a body (sometimes called its *quantity of motion*, sometimes its *momentum*) is not to be understood the velocity only with which the body moves; but the sum of the motion of all its parts taken together: consequently the more matter any body contains, the greater will be its motion, though its velocity remains the same. Thus, supposing two bodies, one containing ten times the quantity of matter the other does, moving with equal velocity; the greater body is said to have ten times the motion, or momentum, that the other has: for it is evident, that a tenth part of the larger has as much as the other whole body. In short, that quality in moving bodies which philosophers understand by the term *momentum* or *motion*, is no other than what is vulgarly called their *force*, which every one knows to depend on their quantity of matter, as well as their velocity. This is that power a moving body has to affect another in all actions that arise from its motion, and is therefore a fundamental principle in mechanics.

Now, since this momentum, or force, depends equally on the quantity of matter a body contains, and on the velocity with which it moves; the method to determine how great it is, is to multiply one by the other. Thus, suppose two bodies, the first having twice the quantity of matter, and thrice the velocity, which the other has; any two numbers, that are to each other as two to one, will express their quantities of matter (it being only their relative velocities and quantities of matter which we need consider); and any two numbers that are as three to one, their velocities: now multiply the quantity of matter in the first, viz. two, by its velocity three, the product is six; and multiply the quantity of matter in the second by its velocity, viz. one, by one, the product is one; their relative forces therefore or powers will be as six to one, or the moment of one is six times greater than that of the other. Again, if their quantities of matter had been as three to eight, and their velocities as two to three, then would their moments have been as six to twenty-four, that is, as one to four.

This being rightly apprehended, what follows, concerning the laws of the communication of motion by impulse and the mechanical powers, will be easily understood.

#### The Communication of Motion.

##### I. In Bodies not Elastic.

75  
Non-elastic  
bodies.

Those bodies are said to be not elastic, which, when they strike against one another, do not rebound, but accompany one another after impact, as if they were joined. This proceeds from their retaining the impression made upon their surfaces, after the impressing force ceases to act. For all rebounding is occasioned by a certain spring in the surfaces of bodies, whereby those parts, which receive the impression made by the stroke, immediately spring back, and throw off the

impinging body; now, this being wanting in bodies void of elasticity, there follows no separation after impact.

When one body impinges on another which is at rest, or moving with less velocity the same way, the quantity of the motion or momentum in both bodies taken together remains the same after impact as before; for by the third law of nature, the re-action of one being equal to the action of the other, what one gains, the other must lose.

Thus, suppose two equal bodies, one impinging with 12 degrees of velocity on the other at rest: the quantities of matter in the bodies being equal, their moments and velocities are the same; the sum in both 12; this remains the same after impact, and is equally divided between them; they have therefore six a-piece; that is, the impinging body communicates half its velocity, and keeps half.

When two bodies impinge on each other by moving contrary ways, the quantity of motion they retain after impact is equal to the difference of the motion they had before: for by the third law of nature, that which had the least motion, will destroy an equal quantity in the other; after which they will move together with the remainder, that is the difference.

Thus for instance, let there be two equal bodies moving towards each other, the one with three degrees of velocity, the other with five, the difference of their moments or velocities will be two; this remains the same after impact, and is equally divided between them, they have therefore one a-piece: that is, the body which had five degrees of velocity, loses three, or as much as the other had; communicates half the remainder, and keeps the other half.

From these positions it is easy to reduce a theorem, that shall find the velocity of bodies after impact in all cases whatever. Let there be two bodies A and B, the velocity of the first *a*, of the other *b*; then the moment of A will be expressed by *Aa*, and of B by *Bb*; therefore the sum of both will be *Aa+Bb*; and *Aa-Bb* will be the difference when they meet. Now these quantities remain the same after impact; but knowing the quantities of motion and quantities of matter, we have the velocity by dividing the former by the latter: therefore  $\frac{Aa+Bb}{A+B}$  or  $\frac{Aa-Bb}{A-B}$  will in all cases express the velocity of the bodies after impact.

##### II. In Elastic Bodies.

Bodies perfectly elastic are such as rebound, after Elastic Bodies impact, with a force equal to that with which they impinge upon one another; those parts of their surfaces, that receive the impression, immediately springing back, and throwing off the impinging bodies with a force equal to that of impact.

From hence it follows, that the action of elastic bodies on each other (that of the spring being equal to that of the stroke) is twice as much as the same in bodies void of elasticity. Therefore, when elastic bodies impinge on each other, the one loses and the other gains twice as much motion as if they had not been elastic; we have therefore an easy way of determining the change of motion in elastic bodies, knowing first what it would have been in the same circumstances, had the bodies been void of elasticity.

Thus, if there be two equal elastic bodies, the one

one in motion with 12 degrees of velocity impinging on the other at rest, the impinging body will communicate twice as much velocity as if it had not been elastic, that is, 12 degrees, or all it had; consequently it will be at rest, and the other will move on with the whole velocity of the former.

It sometimes happens, that in bodies not elastic, the one loses more than half its velocity, in which case, supposing them elastic, it loses more than all; that is, the excess of what it loses, above what it has, is negative, or in a contrary direction. Thus, suppose the circumstances of impact such, that a body, which has but 12 degrees of velocity, loses 16: the overplus four is to be taken the contrary way; that is, the body will rebound with four degrees of velocity. *v. g.* Let it be required to determine the velocity of a body after impact against an immovable object. Let us first suppose the object and body both void of elasticity: it is evident the impinging body would be stopped or lose all its motion, and communicate none; if they are elastic, it must lose twice as much, and consequently will rebound with a force equal to that of the stroke.

It is sufficient if only one of the bodies is elastic, provided the other be infinitely hard; for then the impression in the elastic body will be double of what it would have been had they both been equally elastic: and consequently the force with which they rebound, will be the same as if the impression had been equally divided between the two bodies.

There are no bodies, that we know of, either perfectly elastic, or infinitely hard: the nearer therefore any bodies approach to perfection of elasticity, so much the nearer do the laws, which they observe in the mutual communication of their motion, approach to those we have laid down.

Sir Isaac Newton made trials with several bodies, and found that the same degree of elasticity always appeared in the same bodies, with whatever force they were struck, so that the elastic power, in all the bodies he made trial upon, exerted itself in one constant proportion to the compressing force. He found the celerity with which balls of wool, bound up very compact, receded from each other, to bear nearly the proportion of five to nine to the celerity wherewith they met; and in steel, he found nearly the same proportion: in cork the elasticity was something less, but in glass much greater; for the celerity, with which balls of that material separated after percussion, he found to bear the proportion of 15 to 16 to the celerity wherewith they met.

We have hitherto supposed the direction, in which bodies impinge upon one another, to be perpendicular to their surfaces: when it is not so, the force of impact will be less, by how much the more that direction varies from the perpendicular; for it is manifest, that a direct impulse is the greatest of all others that can be given with the same degree of velocity.

The force of oblique percussion is to that of direct, as the sine of the angle of incidence to the radius.

*Dem.* Let there be a plane, as AD, against which let a body impinge in the point D in the direction BD: which line may be supposed to express the force of direct impulse, and may be resolved into two others BC and BA; the one parallel, the other per-

pendicular to the plane; but that force which is exerted in a direction parallel to the plane can no way affect it: the stroke therefore arises wholly from the other force expressed by the line BA; but this is to the line BD, as the sine of the angle of incidence ADB to the radius; from whence the proposition is clear.

If the surface of the body to be struck is a curve, then let AD be made a tangent to D the point of incidence, and the demonstration will be the same.

This is the case when bodies impel one another by acting upon their surfaces; but in forces, where the surfaces of bodies are not concerned, as in attraction, &c. we must not consider the relation which the direction of the force has to the surface of the body to be moved, but to the direction in which it is to be moved by that force. Here the force of action will be less, by how much the more these two directions vary from each other.

The force of oblique action is to that of direct, as the co-sine of the angle comprehended between the direction of the force, and that wherein a body is to be moved thereby, to the radius.

*Dem.* Let FD represent a force acting up. Fig. 11. on a body as D, and impelling it towards E; but let DM be the only way in which it is possible for the body to move: the force FD may be resolved into two others FG and FH, or which is equal to GD; but it is evident that only the force GD impels it towards M. Now, FD being the radius, GD is the co-sine of the angle FDG comprehended between the two directions FE and GM; from whence the proposition is clear.

The meaning in both cases will be understood from the instance of a ship under sail. The force by which the wind acts upon the sail, will be less, by how much the more the direction of the wind varies from one that is perpendicular to the surface of the sail: but the force of the sail, to move the ship forward, will be less, by how much the more the direction of the ship's course varies from that in which she is impelled by the sail.

To this we may add the following proposition relating to oblique forces, viz. that if a body is drawn or impelled three different ways at the same time by as many forces acting in different directions; and if the quantity of those forces is such, that the body is kept in its place by them: then will the forces be to each other, as the several sides of a triangle drawn respectively parallel to the directions in which they act.

*Dem.* Let the lines AB, AD, AE, represent Fig. 12. the three forces acting upon the body A in those directions, and by that means keeping it at rest in the point A. Then the forces EA and DA will be equivalent to BA, otherwise the body would be put into motion by them. But these forces are also equivalent to AC, consequently AC may be made use of to express the force AB; and EC, which is parallel and equal to AD, may express the force AD, while AE expresses its own: but ACE is a triangle whose sides are all parallel to the given directions; therefore the sides of this triangle will express the relation of the forces by which the body is kept at rest. Q. E. D.



CHAP. VIII. *Demonstration of the Effects of the Mechanical Powers.*

THOUGH the effects of the powers of mechanifm are apparent to every eye, yet, to give a mathematical demonstration why thefe effects muft always take place, is by no means an eafy matter. The moft elegant and convincing demonstration of this kind is that by Dr Hamilton, profeffor of philofophy in the univerfity of Dublin.—“The moft noted theorem in mechanics (fays he) is this, “When two heavy bodies counterpoife each other by means of any machine, and are then made to move together, the quantities of motion with which one defends and the other afcends perpendicularly will be equal.” An æquilibrium always accompanying this equality of motions, bears fuch a refemblance to the cafe wherein two moving bodies flop each other when they meet together with equal quantities of motion, that many writers have thought that the caufe of an æquilibrium in the feveral machines might be immediately affigned, by faying, that fince one body always lofes as much motion as it communicates to another, two heavy bodies counteracting each other muft continue at reft, when they are fo circumftanced that one cannot defend without caufing the other to afcend at the fame time, and with the fame quantity of motion. For then, fhould one of them begin to defend, it muft instantly lofe its whole motion by communicating it to the other. This argument, however plausible it may feem, I think is by no means fatisfactory; for when we fay that one body communicates its motion to another, we muft neceffarily fuppofe the motion to exit firft in the one and then in the other; but in the prefent cafe, where the two bodies are fo connected that one cannot poffibly begin to move before the other, the defending body cannot be faid to communicate its motion to the other, and thereby make it afcend: But whatever we fhould fuppofe caufes one body to defend, muft be alfo the immediate caufe of the other’s afcending; fince, from the connection of the bodies, it muft act upon them both together as if they were really but one. And therefore, without contradicting the laws of motion, I might fuppofe the fuperior weight of the heavier body, which is in itfelf more than able to fustain the lighter, would overcome the lighter, and caufe it to afcend with the fame quantity of motion with which the heavier defends; efpecially as both their motions, taken together, may be lefs than what the difference of the weights, which is here fuppofed to be the moving force, would be able to produce in a body falling freely.

However, as the theorem above-mentioned is a very elegant one, it ought certainly to be taken notice of in every treatife of mechanics, and may ferve as a very good index of an æquilibrium in all machines: but I do not think that we can from thence, or from any one general principle, explain the nature and effects of all the mechanic powers in a fatisfactory manner; becaufe fome of thefe machines differ very much from others in their ftructures, and the true reafon of the efficacy of each of them is beft derived from its particular ftructure.

“The fimple mechanic powers are ufually reckoned fix; the lever, axle and wheel, pulley, wedge, inclined plane, and fcrew. I fhall confider thefe machines feparately, and explain the nature and property of each of them, by fhewing from its ftructure what weight it will enable any given force to fustain.

“The lever is confidered as an inflexible line, void of weight, and moveable about a fixed point called its *fulcrum* or prop. The property of the lever, expreffed in the moft general terms, is this: “When two weights, or any two forces, act againft each other on the arms of a lever, and are in *æquilibrio*, they will be to each other inverfely as the perpendicular or fhorteft diftances of their lines of direction from the fulcrum.”

“This propofition contains two cafes; for the directions of the forces may either meet in a point, or be parallel to each other. Moft writers begin their demonstration of this propofition with the fecond cafe, which feems to be the fimpleft, and from which the other may be deduced by the refolution of forces. Archimedes, in his demonstration, fets out with a fuppofition, the truth of which may reafonably be doubted: for he fuppofes, that if a number of equal weights be fufpended from the arm of a lever, and at points equidiftant from each other, whether all thefe points be at the fame fide of the fulcrum, or fome of them on the oppofite fide, thefe weights will have the fame force to turn the lever as they would have were they all united and fufpended from a point which lies in the middle between all the points of fufpention, and may be confidered as the common centre of gravity of all the feperate weights. Mr Huygens, in his *Mifcellaneous obfervations on mechanics*, fays, that fome mathematicians have endeavoured, by altering the form of this demonstration, to render its defects lefs fenfible; though without fuccefs. He therefore propofed another proof, which is extremely tedious and prolix, and alfo depends on a poffulatam, that, I think, ought not to be granted on this occafion; it is this: “When two equal bodies are placed on the arms of a lever, that which is furtheft from the fulcrum will prevail and raife the other up.” Now, this is taking it for granted, in other words, that a fmall weight placed further from the fulcrum, will fustain or raife a greater one. The caufe and reafon of which fact muft be derived from the demonstration that follows, and therefore this demonstration ought not to be founded on the fuppofed felf-evidence of what is partly the thing to be proved.

“Sir Ifaac Newton’s demonstration of this propofition is indeed very concise; but it depends on this fuppofition, that when from the fulcrum of a lever feveral arms or radii ifTue out in different directions, all lying in the fame vertical plane, a given weight will have the fame power to turn the lever from which-ever arm it hangs, provided the diftance of its line of direction from the fulcrum remains the fame. Now it muft appear difficult to admit this fuppofition, when we confider that the weight can exert its whole force to turn the lever only on that arm which is the fhorteft, and is parallel to the horizon, and on which it acts perpendicularly; and that the forces which it exerts, or with which it acts perpendicularly, on any one of the oblique arms, muft be inverfely as the length of

of that arm, which is evident from the resolution of forces.

‘ Mr Maclaurin, in his *View of Newton’s philosophy*, after giving us the methods by which Archimedes and Newton prove the property of the lever, proposes one of his own, which, he says, appears to be the most natural one for this purpose. From equal bodies, sustaining each other at equal distances from the fulcrum, he shews us how to infer that a body of one pound (for instance) will sustain another of two pounds at half its distance from the fulcrum; and from thence that it will sustain one of three pounds at a third part of its distance from the fulcrum: and going on thus, he deduces, by a kind of induction, what the proportion is in general between two bodies that sustain each other on the arms of a lever. But this argument, were it otherwise satisfactory, yet as it cannot be applied when the arms of the lever are incommensurable, it cannot conclude generally, and therefore is imperfect.

‘ There are some writers on mechanics, who, from the composition of forces, demonstrate that case of the general proposition relating to the lever, in which the directions of the forces are oblique to each other, and meet in a point: but I do not find that they have had any other way of proving the second case, in which the directions of the forces are parallel, but by considering these directions as making an angle with each other, though an infinitely small one, or as meeting at an infinite distance; which way of reasoning is not to be admitted in subjects of this kind, where the proof should always hinge on, directly from the laws of motion, why the conclusion must be true, in such manner that we might see clearly the force of every step from the first principles down to the conclusion, which we are prevented from doing when any such arbitrary and inconsistent supposition is introduced.

‘ From thus considering the various proofs that have been given of this fundamental proposition in mechanics, we may see the reason why many subsequent writers have appeared dissatisfied with the former demonstrations, and have looked for new ones: I shall now propose two methods of demonstrating it, merely from the composition and resolution of forces. The proposition may be expressed as follows.

“ When three forces act upon an inflexible line, whether straight or crooked, and keep it *in equilibrio*, any two of them will be to each other inversely as the perpendicular distances of their lines of direction from that point to which the third force is applied.”

‘ Let the three forces E, G, F, (fig. 2.) act upon three points A, B, D, in an inflexible line; and first let the directions of the forces E and F (which act on the same side of the line) meet in the point C. Then it is evident that the force, which is compounded of these two, must act upon the line ABD in the direction of a right line that passeth through the point C; consequently the force G, which sustains this compounded force, must be equal thereunto, and must act in a contrary direction; therefore the force G must act in the direction of the line CB. From the point B draw BH and BK perpendicular to the directions of the forces E and F, and draw BM and

and, BN parallel to these directions, forming the parallelogram BMCN; then, since these three forces are *in equilibrio*, they must be to each other respectively as the sides and diagonal of this parallelogram to which their directions are parallel; therefore E is to F as CM to CN or MB, that is, (because the sides of a triangle are as the sines of the opposite angles) as the sine of the angle MBC, or its alternate one BCN, to the sine of the angle BCM; but making CB the radius, BK is the sine of the former angle, and BH of the latter; therefore E is to F as BK to BH; so that the forces E and F are to each other inversely as the perpendicular distances of their lines of direction from the point B, on which the third force G acts. Now to compare the forces F and G together: From the point A, on which the third force acts, draw AB and AL perpendicular to the directions of the forces G and F; then, as was said before, F is to G as MB is to CB; but MB is to CB as AB to AL; because, making CA the radius, AB is the sine of the angle MCB, and AL is the sine of the angle MCN, or CMB its supplement, to two right ones; therefore the forces F and G are to each other inversely as the perpendicular distances of their lines of direction from the point A, on which the third force E acts; and thus the first case of the proposition is proved, in which the forces act against each other in oblique directions.

‘ We must now consider what parts of the forces E and F act against the force G in directions parallel to GC; for it is such parts only that really oppose the force G, and keep it *in equilibrio*; and from thence we shall see what proportion two forces must have to each other when they are *in equilibrio*, and act in parallel directions. Let the three forces act upon the points A, B, and D, (fig. 2.); let them be *in equilibrio*, and Fig. 2. in their lines of direction meet in the point C, as in the preceding case: then if the points A, B, and D, are not in a right line, draw the line AD meeting BC in P, and from P draw PN and PM parallel to the directions of the forces E and F; through the points A and D draw lines parallel to BC; and through B draw a perpendicular to these lines, meeting them in H and K; from the point M draw MO parallel to AD, and meeting BC in O. Now the three forces E, G, and F, that are *in equilibrio*, will be to each other respectively as the sides of the triangle CMP, as in the preceding case; but the force E, which is denoted by the line MC, may be resolved into two forces acting in the directions MO and OC, the former of these only urges the point A towards D, and the latter acts in direct opposition to the force G; in like manner the force F, which is denoted by the line PM, may be resolved into two forces acting in the directions OM and PO, the former of which only urges the point D towards A, and the latter acts in direct opposition to the force G; now it is evident that the force G, which is denoted by the line PC, is sustained only by those parts of the forces E and F which act against it, in directions parallel to BC, and are denoted by the lines OC and PO, which, taken together, are equal to PC; for the other parts of the forces E and F which are denoted by MO, are lost, being equal, and contrary to each other: if, therefore, instead of the forces F and E, we suppose two other forces, R and L, to act on the points

late  
LXVIII.  
5. 2.

D and A, in directions parallel to BC, and to keep the force G *in equilibrio*, it follows, from what has been proved, that R and L taken together will be equal to G, and that these three forces will be to each other respectively as the lines PO, OC, and PC; therefore R will be to L as (PO to OC, that is, as AM to MC, or as AP to PD, or) HB to BK, consequently the forces R and L are to each other inversely as the perpendicular distances of their lines of direction from the point B, to which the third force is applied. Now to compare the forces R and G together; since the forces R and L may be denoted by BH and BK, and are both together equal to G, that force will be denoted by the whole line KH, and therefore R will be to G as BH to KH; so that these forces are also to each other inversely as the perpendicular distances of their lines of direction from the line of direction of the third force L; and thus the second case of the proposition is proved, in which the forces act against each other in parallel directions. If the point in the inflexible line, to which one of the forces is applied, should become a fixed point, or *fulcrum*, round which the line may turn, it is evident that the other two forces will continue *in equilibrio*, as they were before; and therefore the property of the lever, in all cases, is manifestly proved by this proposition.

‘The centre of gravity of a body is said to be that point which being sustained, or prevented from descending, the body will continue at rest. From hence it follows, that when a body hangs freely from a single point and continues at rest, its centre of gravity will lie perpendicularly under the point of suspension; for in that situation only it will be sustained, and can descend no lower.

‘From this property, which agrees likewise to the common centre of gravity of two bodies joined together by an inflexible right line, and which may then be considered as one, I shall shew that their centre of gravity is a point in the line that joins them together, so situated that the distances of the two bodies from it are to each other inversely as their weights. This theorem concerning the position of the common centre of gravity of two bodies, which is a very noted one in mechanics, I have never seen demonstrated otherwise than by inferring it from the general property of the lever: but I think the method I shall now propose of deducing it directly from the definition of the centre of gravity, is the most concise as well as the most natural, and besides it will afford us a very easy way of demonstrating the property of the lever.

‘Let the two bodies A and B be joined by an inflexible right line passing through their centres of gravity, and let them be suspended from the fixed point or pin at P, by the threads AP and BP, so that they may hang freely in such a position as their joint gravity will give them. When these bodies continue at rest, their common centre of gravity must lie directly under the point of suspension, or in the perpendicular line PL, consequently it must be at the point C, the intersection of the lines PL and AB; the position of which point, in the line AB, will be determined by finding out the proportion between the segments CA and CB. If the inflexible line was not interposed between these bodies, they would move till their threads coincided with the perpendicular line PL; since there-

fore, they are kept asunder by this line, they must urge it with certain forces in opposite directions; and these urging forces must be equal, since the line on which they act continues at rest: and therefore the force with which each body urges the other in the direction of this line, may be denoted by the same letter U, and we may denote the weights of the two bodies respectively by the letters A and B. Now the body A is acted upon by three forces, *viz.* by its weight A in the direction PC, by the force U with which the other body urges it in the direction CA, and by the reaction of the pin in the direction AP; and since these three forces are *in equilibrio*, and keep the body at rest, they are to each other respectively as the sides of the triangle PCA; therefore A is to U, as PC to CA. In like manner the body B is urged by three forces, *viz.* its weight B in the direction PC, the urging force U in the direction CB, and the reaction of the pin in the direction BP, which forces are to each other as the sides of the triangle PCB; therefore U is to B, as CB to PC; and therefore (*ex aequo perturbate*) A is to B, as CB to CA; consequently the weights of the bodies A and B are to each other inversely as their distances from the point C, which lies directly under the point of suspension, and is therefore their common centre of gravity.

‘When two bodies are connected by an inflexible line, and this line is supported by a prop so that their centre of gravity cannot descend, the bodies must continue to rest, and will be *in equilibrio*. Therefore it is easy to see how, from the theorem now demonstrated, we may prove the property of the lever in that case where the directions of the forces are parallel; and from thence the other case, in which the directions are oblique to each other, may be deduced by the resolution of forces, as is usually done. And this is the second method by which I laid the general property of the lever might be strictly demonstrated.

‘The lever is the most simple of all the mechanic powers; and to it may be reduced the balance and the *axis in peritrochio*, or axle and wheel: Though I do not consider the balance as a distinct mechanic power, because it is evidently no other than a lever fitted for the particular purpose of comparing the weights of bodies, and does not serve for raising great weights or overcoming resistances as the other machines do.

When a weight is to be raised by means of an axle and wheel, it is fastened to a cord that goes round the axle, and the power which is to raise it is hung to a cord that goes round the wheel. If then the power be to the weight as the radius of the axle to the radius of the wheel, it will just support that weight, as will easily appear from what was proved of the lever. For the axle and wheel may be considered as a lever, whose *fulcrum* is a line passing through the centre of the wheel and middle of the axle, and whose long and short arms are the radii of the wheel and axle which are parallel to the horizon, and from whose extremities the cords hang perpendicularly. And thus an axle and wheel may be looked upon as a kind of perpetual lever, on whose arms the power and weight always act perpendicularly, though the lever turns round its *fulcrum*. And in like manner, when wheels and axles move each other by means of teeth on their peripheries, such a machine is really a perpetual compound lever:

Fig. 3.



lever: and, by considering it as such, we may compute the proportion of any power to the weight it is able to sustain by the help of such an engine. And since the radii of two contiguous wheels, whose teeth are applied to each other, are as the number of teeth in each, or inversely as the number of revolutions which they make in the same time; we may, in the computation, instead of the ratio of these radii, put the ratio of the number of the teeth on each wheel, or the inverse ratio of the number of revolutions they make in the same time.

Some writers have thought the nature and effects of the pulley might be best explained by considering a fixed pulley as a lever of the first, and a moveable pulley as one of the second kind. But the pulley cannot properly be considered as a lever of any kind; for when any power sustains a weight by means of a system of pulleys, that power will sustain the same weight if the pulleys be removed, and the ropes be brought over the axes on which the pulleys turned. And in this case I believe no one would say that these axes could be considered as levers. If the weight was to be raised up, there would in this case be a very great resistance from the friction of the ropes on the axes; and it is merely to avoid this resistance that pulleys are used, which move round the axes with but little friction. I think the best and most natural method of explaining the effects of the pulley (that is, of computing the proportion of any power to the weight it can sustain by means of any system of pulleys), is by considering that every moveable pulley hangs by two ropes equally stretched, which must bear equal parts of the weight; and therefore when one and the same rope goes round several fixed and moveable pulleys, since all its parts on each side of the pulleys are equally stretched, the whole weight must be divided equally amongst all the ropes by which the moveable pulleys hang. And consequently if the power which acts on one rope be equal to the weight divided by the number of ropes, that power must sustain the weight.

Upon this principle the proportion of the power to the weight it sustains by means of any system of pulleys, may be computed in a manner so easy and natural, as must be obvious to every common capacity.

The proportion which any power bears to the resisting force it is able to sustain by means of a wedge, has been laid down differently by different authors as they happened to consider it in particular cases. Without examining their several opinions, I shall endeavour to express this proportion in one general proposition, which may extend to the several cases in which the wedge is applied.

Let the æquilateral triangle ABC represent a wedge, whose base or back is AC, and sides are the lines AB and CB, and whose height is the line BP, which bisects the vertical angle ABC, and also the base perpendicularly in P. When a power is applied to the wedge in order to overcome or remove any resisting forces, it acts perpendicularly on the back of the wedge, and the resisting forces act on its sides, and

they are always supposed to act in directions that make equal angles with the sides. When the resisting forces and the power that acts on the wedge are in *equilibrium*, the former will be to the latter, as the height of the wedge to a line drawn from the middle of the base to one side, and parallel to the direction in which the resisting force acts on that side.

Let E and F represent two bodies, or two resisting forces acting on the sides of the wedge perpendicularly, and whose lines of direction EP and FP meet at the middle point of the base, on which the power P acts perpendicularly, then will EP and FP be equal: let the parallelogram ENFP be completed, its diagonals PN and EF will bisect each other perpendicularly in H. Now when these forces (which act perpendicularly on the sides and base of the wedge,) are in *equilibrium*, they will be to each other as the sides and diagonal of this parallelogram, that is, the sum of the resisting forces will be to the power P, as the sides EP and FP to the diagonal PN, or as one side EP to half the diagonal PH, that is (from the similarity of the right-angled triangles BEP, EHP) as BP, the height of the wedge, to EP the line which is drawn from the middle of the base to the side AB, and is the direction in which the resisting force acts on that side.

From the demonstration of this case, in which the resisting forces act perpendicularly on the sides of the wedge, it appears that the resistance is to the power which sustains it, as one side of the wedge AB is to the half of its breadth AP; because AB is to AP as BP is to EP.

It appears from hence, that if PN be made to denote the force with which the power P acts on the wedge, the lines PE and PF, which are perpendicular to the sides, will denote the force with which the power P protrudes the resisting bodies in directions perpendicular to the sides of the wedge.

Let us now suppose in the second case, that the resisting bodies E and F act upon the wedge in directions parallel to the lines DP and OP, that are equally inclined to its sides, and meet in the point P. Draw the lines EG and FK perpendicular to DP and OP; then making PN denote the force with which the power P acts on the wedge, PE and PF will denote the forces with which it protrudes the resisting bodies in directions perpendicular to the sides of the wedge, as I observed before: now each of these forces may be resolved into two, denoted respectively by the lines PG and GE, PK and KF, of which GE and KF will be lost, as they act in directions perpendicular to those of the resisting bodies; and PG and PK will denote the forces by which the power P opposes the resisting bodies, by protruding them in directions contrary to those in which they act on the wedge; therefore, when the resisting forces are in *equilibrium* with the power P, the former must be to the latter, as the sum of the lines PG and PK is to PN, or as PG is to PH, that is, as PB, the height of the wedge, is to PD (Δ) the line drawn from the middle of the base to one side of the

Plate  
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fig. 4.

(A) [PG is to PH as PB to PD.] The right-angled triangles PGE and PED are similar, having the angle at P common to both; therefore PG is to PE as PE to PD: so likewise the right-angled triangles PHE and PEB are similar, and therefore PH is to PE as PE to PB: therefore the rectangles PG into PD and PH into PB are equal, each of them being equal to the square of PE; consequently their sides are reciprocally proportional, that is, PG is to PH as PB to PD.

the wedge and parallel to the direction in which the resisting force acts on that side.

From what has been demonstrated, we may deduce the proportion of the power to the resistance it is able to sustain in all the cases in which the wedge is applied. First, when in cleaving timber the wedge fills the cleft, then the resistance of the timber acts perpendicularly on the sides of the wedge; therefore in this case, when the power which drives the wedge is to the cohesive force of the timber as half the base to one side of the wedge, the power and resistance will be in equilibrium.

Secondly, when the wedge does not exactly fill the cleft, which generally happens, because the wood splits to some distance before the wedge: Let ELF represent a cleft into which the wedge ABC is partly driven; as the resisting force of the timber must act on the wedge in directions perpendicular to the sides of the cleft, draw the line PD in a direction perpendicular to EL the side of the cleft, and meeting the side of the wedge in D; then the power driving the wedge and the resistance of the timber when they balance, will be to each other as the line PD to PB the height of the wedge.

Thirdly, when a wedge is employed to separate two bodies that lie together on an horizontal plane, for instance two blocks of stone; as these bodies must recede from each other in horizontal directions, their resistance must act on the wedge in lines parallel to its base CA; therefore the power which drives the wedge will balance the resistance when they are to each other as PA, half the breadth of the wedge to PB its height; and then any additional force sufficient to overcome the resistance arising from the friction of the bodies on the horizontal plane will separate them from each other.

The inclined plane is reckoned by some writers among the mechanic powers; and I think with reason, as it may be used with advantage in raising weights.

Let the line AB represent the length of an inclined plane, AD its height, and the line BD we may call its *base*. Let the circular body GEF be supposed to rest on the inclined plane, and to be kept from falling down it by a string CS tied to its centre C. Then the force with which this body stretches the string will be to its whole weight, as the sine of ABD, the angle of elevation, to the sine of the angle which the string contains with a line perpendicular to AB the length of the plane. For let the radius CE be drawn perpendicular to the horizon, and CF perpendicular to AB, and from E draw EO parallel to the string and meeting CF in O: Then, as the body continues at rest and is urged by three forces, viz. by its weight in the direction CE, by the reaction of the plane in the direction FC, and by the reaction of the string in the direction EO; the reaction of the string, or the force by which it is stretched, is to the weight of the body as EO to CE; that is, as the sine of (the angle ECO, which is equal to) ABD the angle of elevation, to the sine of the angle EOC, equal to SCO, the angle which the string contains with the line CF perpendicular to AB, the length of the plane.

When therefore the string is parallel to the length of the plane; the force with which it is stretched, or with which the body tends down the inclined plane, is to its whole weight, as the sine of the angle

of elevation to the radius, or as the height of the plane to the length. And in the same manner it may be shewn, that when the string is parallel to BD the base of the plane, the force with which it is stretched is to the weight of the body as AD to BD, that is, as the height of the plane to its base. If we suppose the string which supports the body CEF, to be fastened at S; and that a force, by acting on the line AD, the height of the plane, in a direction parallel to the base BD, drives the inclined plane under the body, and by that means makes it rise in a direction parallel to AD: Then, from what was proved in the third case of the wedge, it will appear, that this force must be to the weight of the body, as AD to BD, or rather in a proportion somewhat greater; if it makes the plane move on and the body rise.

From this last observation we may clearly shew the nature and force of the screw; a machine of great efficacy in raising weights, or in pressing bodies closely together. For if the triangle ABD be turned round a cylinder whose periphery is equal to BD, then the length of the inclined plane BA will rise round the cylinder in a spiral manner, and form what is called the *thread* of the screw; and we may suppose it continued in the same manner round the cylinder from one end to the other; and AD the height of the inclined plane will be every where the distance between two contiguous threads of this screw, which is called a *convex screw*. And a concave screw may be formed to fit this exactly, if an inclined plane every way like the former be turned round the inside of a hollow cylinder, whose periphery is somewhat larger than that of the other. Let us now suppose the concave screw to be fixed, and the convex one to be fitted into it, and a weight to be laid on the top of the convex screw: then, if a power be applied to the periphery of this convex screw to turn it round, at every revolution the weight will be raised up through a space equal to the distance between the two contiguous threads, that is, to the line AD the height of the inclined plane BA; therefore, since this power applied to the periphery acts in a direction parallel to BD, it must be to the weight it raises as AD to BD, or as the distance between two contiguous threads to the periphery of the convex screw, which distance between two contiguous threads is to be measured by a line parallel to the length of the screw. If we now suppose that a hand-spike or handle is inserted into the bottom of the convex screw, and that the power which turns the screw is applied to the extremity of this handle, which is generally the case; then as the power is removed farther from the axis of motion, its force will be so much increased, and therefore so much may the power itself be diminished. So that the power which, acting on the end of a handle, sustains a weight by means of a screw, will be to that weight as the distance between two contiguous threads of the screw, to the periphery described by the end of the handle. In this case we may consider the machine as composed of a screw and a lever, or, as Sir Isaac Newton expresses it, *cuneus à velle impulsus*.

Of any two or more of these simple machines combined together, all other machines, however complicated, are composed. And their powers and manner of acting may therefore be explained from the principles here laid down.

Mechoacan,  
Mecklen-  
burg.

**MECHOACAN**, a province of Mexico, or New Spain, in America, bounded on the north by Panuco and Guadalupe, on the east by Panuco and Mexico Proper, on the south by the Pacific Ocean, and on the west by Guadalupe and the South Sea. The soil is exceedingly fertile; and the climate so wholesome, that the Spaniards imagine it to be possessed of some peculiarly restorative qualities; for which reason the sick and infirm flock to it from all quarters. The commodities are sulphur, indigo, farfaparilla, safafra, cacao, vanelloes, ambergris, hides, wool, cotton, silk, sugar, the root mechoacan or white jalap, and silver. This province formed an independent kingdom at the time Mexico was reduced by Cortez. The sovereign had long been the inveterate enemy of the Mexicans, and was considered, next to the republic of Tlascala, as the most formidable barrier against the extension of the imperial frontier. However, he submitted to Cortez without striking a blow, being intimidated by the wonders he had performed with a handful of men; and thus Mechoacan became a province of the Spanish empire, and a valuable addition to Mexico. The country at that time was exceedingly populous, but the natives are now much thinned; and that rather by the luxury and effeminacy introduced by the Spaniards, than by their tyranny. The capital of the province is also called *Mechoacan* by the natives, but *Valladolid* by the Spaniards.

**MECHOACAN**, or *White Jalap*. See CONVULVULUS, and the *Table* of the *MATERIA MEDICA*.

**MECKLENBURG**, a duchy of Germany, containing those of Schwerin and Gültro, is bounded by Pomerania on the east, by part of the marquisate of Brandenburg and the duchy of Lunenburg on the south, the Baltic on the north, and Holstein and Saxe-Lawenburg on the west. Their greatest length is about 120 miles, and greatest breadth upwards of 60. With respect to the soil, much cannot be said in favour of it, as it consists in general, either of sand, or large and desolate heaths, interspersed with moors, woods, fens, and lakes. It yields very little wheat, and not a great deal of oats, rye, and barley; but breeds a considerable number of sheep and cattle, has plenty of fish, with stone-quarries, salt-springs, alum, iron, and some copper. The principal rivers here are the Elbe and Stör, which fall into the Elbe as it glides along the borders of this country to the south-west; the Reckenitz, which discharges itself into the Baltic; as do the Peene, the Warnow, and the Stopenitz. This country has only one harbour on the Baltic, namely, that of Rostock. In both duchies, exclusive of Rostock, are 45 great and small cities, with three convents, and a great number of manors and farms, belonging either to the duke, the nobility, or convents. The peasants are in a state of vassalage; but the nobility enjoy very considerable privileges. The states are composed of the nobility and towns; and the diets, which are summoned annually, are held alternately at Sternberg and Malchin. The duchy of Schwerin appoints four provincial counsellors, and that of Gültro as many; who rank, according to seniority, with the duke's actual privy-counsellors, as their marshals do with the colonels. The lesser committee represents the whole body of the nobility and commons, by whom the members are chosen freely

and without controul, and no edict relative to the whole country can be published without their consent, or in prejudice of their rights. The inhabitants of this country are mostly Lutherans, under their superintendants. There are also some Calvinists and Roman Catholics. Besides the grammar-schools in the towns, there is an university at Rostock. The commodities of the duchy are corn, flax, hemp, hops, wax, honey, cattle, butter, cheese, wool, and wood, a part of which is exported, but hardly any manufactures.

Of the house of Mecklenburg, there are two lines still subsisting, viz. that of Schwerin and Strelitz. The latter commenced in duke Adolphus Frederick II. younger brother of the duke of Schwerin, and grandfather of the present duke of Strelitz, Adolphus Frederick IV. who entered on the government in 1752, and whose family hath lately received a great additional lustre by his Britannic majesty's taking his second filer for his consort, and by her own great merit and noble deportment in that high station. Besides the duchy of Strelitz, to this duke belong the principality of Ratzeburg, with the lordship of Stargard, the ancient commanderies of Miro and Nemero, and a yearly pension of 9000 dollars out of the Boitzenburgh toll. The title assumed by both the dukes is *duke of Mecklenburg, prince of Wenden, Schwerin, and Ratzeburg, count of Schwerin and the country of Rostock, and lord of Stargard*. By the agreement concluded at Wittstock in 1442, the elector of Brandenburg, on the extinction of the male-line of the dukes of Mecklenburg, is entitled to their whole succession. The duke of Schwerin has two votes both in the diet of the empire and that of the circle. The matricular assessment for the duchies of Schwerin and Gültro is 40 horse and 67 foot, or 748 florins monthly, including what is paid by Sweden for Wismar, and the bailiwicks of Poll and Neukloster. To the chamber of Wetzlar these two duchies pay each 243 rix-dollars, 43 krutzers. For the government of Mecklenburg, the administration of justice, and the management of the revenue, there is the privy council of regency, the demesne-chamber, the high and provincial court of justice, to which appeals lie in most cases, both from the consistory and the inferior civil courts, and which are common to both the dukes. As to the revenues, those of the Schwerin line must be very considerable, those arising from the demesne-bailiwicks and regalia alone amounting to 300,000 rix-dollars per annum. There is a tax on land that produces no contemptible sum, and that called the *prince's tax* is fixed at 20,000 rix-dollars: besides all these, there are also free-gifts. The whole revenues of the Strelitz branch are estimated at 120,000 rix-dollars. Each of these princes maintains a body of troops.

**MECONIUM**, the excrement contained in the guts of an infant at its birth. If this matter is not soon purged off, it occasions gripes, &c. A tea-spoonful of true castor oil is an excellent purge in this case; but the first milk from the mother's breast is usually sufficient if it flows in due time.

**MECONIUM**, in pharmacy, the extract of British poppies. It has all the virtues of foreign opium, but in a somewhat lower degree. See *OPIMUM*, and *Table*

Mecklen-  
burgh,  
Meconium



of the MATERIA MEDICA.

MEDAL, a piece of metal in the form of coin, such as was either current money among the ancients, or struck on any particular occasion, in order to preserve to posterity the portrait of some great person, or the memory of some illustrious action.

Scaliger deriveth the word *medal* from the Arabic *metallia*; a sort of coin with a human head upon it. But the opinion of Vossius is generally received; viz. that it comes from *metallum*, "metal;" of which substance medals are commonly made.—Some, indeed, apprehend that none of the ancient pieces we now style *medals*, were never current coin, but all struck on particular occasions; like those modern pieces which are called by that name, to distinguish them from common and current coin. Others are of a contrary opinion, as Monsieur Patin and Father Joubert, who endeavour to prove, that they had all a regular and fixed price in payment. But the much greater probability of the middle opinion hath obtained it the general vogue: according to which, medals are distinguished into two sorts. Of the first sort, some are supposed to have been originally intended, either for *missilia*, which were scattered among the people on days of triumph, jubilees, and solemn processions, as is usual among us at the coronation: or for *donativa*, of which presents were made to princes, or their ambassadors, or to others in a way of honorary reward for some worthy action; as our Royal Society present every year a gold medal to one of its members who hath distinguished himself by some valuable discovery in natural philosophy. Others, which are of the most exquisite workmanship, are supposed to be *testimonia probata moneta*; that is, essays of the workmanship of the mint-masters, which were presented to their princes and to persons of the highest quality.

The second sort, of which there is the greatest quantity, are taken to have been originally the current coin of their respective nations, but which thro' their scarcity are now laid up in the cabinets of the curiosus.

Ancient medals are often found in the ruins of great buildings, in Greece, Italy, and other countries; where they are picked up, chiefly after violent showers of rain, when being washed from the dirt, they are more easily discovered. They are often found in the earth, by ploughing or digging; sometimes singly, as having been dropped casually; sometimes in urns, which are filled with them. They are often also found in ancient Roman sepulchres; for instance, in the tumuli, or round mounds of earth, about 10 or 12 feet high, which are seen by the sides of public roads in some parts of England, particularly in Leicestershire. These tumuli are the sepulchres of Roman officers, who were buried there while their legions were in that country; and are generally found cupped at the top, by their having been dug for urns and medals. And for the most part wherever there have been towns or encampments of the Romans, many of their coins are discovered in the earth by ploughing or digging; particularly at Silchester in Hampshire, (the ancient Windomis of the Romans, of which professor Ward has given an account in the Philosophical Transactions, n<sup>o</sup> 490.) great numbers have been found of all metals, and of all sizes. One gentleman in the

neighbourhood is possessed of several hundreds collected from this Roman settlement, and many of them exceedingly well preserved. Nay, so extensive was the commerce of the Roman empire in its most flourishing state, that there is hardly a country in the world where its coins have not been discovered. Nor need we except even America, if we may depend on what Maurinus Sciculus relates in his history of Spain, cap. 19. viz. that a brass medal of the emperor Augustus was found in the gold mines of Brazil, and sent by the archbishop of the province to the pope.

As to the æra of the invention of medals, or coins, see the articles COINS and MONEY.

The matter or substance of ancient medals is commonly one of the three metals signified by the three A's, which, on several coins, are placed after the name of the mint-master; namely, gold, silver, and copper or brass. Some medals, however, are said to have been found of iron. Yet it cannot be supposed, that, if there were such formerly, many of them can be now remaining; because that metal is so subject to decay with rust. There are many silver coins to be met with, debased below the proper standard. In the declension of the Roman empire, when there was a scarcity of the richer metals, this was sometimes done by authority, in order to raise money to pay the army; which at times occasioned seditions among them. For the like purpose, when our king James II. was distressed for money during the war in Ireland, he coined copper shillings and half-crowns. However, among the Romans, this was sometimes done clandestinely, by the knavery of the mint-masters or coiners; notwithstanding it was made a capital crime. Thus Pliny writes, that when M. Antoninus was triumvir, he mixed iron with the denarii, which should have been all silver. But the most common mixture in the base coin is that of copper or brass. We sometimes meet with old coins little better than lead: and some tell us, that Numa stamped money of leather; but no such coins are to be found at this day.

As for the æs, (the first and most common metal used in coinage,) it is distinguished into three sorts, viz. the red copper, the yellow or brass, and the pot-metal, which was copper mixed with tin or lead. Before Alex. Severus, most coins were of the two former sorts; but after him, almost all are of the last.

The second sort, or yellow, is also distinguished into the common brass, or kettle-metal; and the Corinthian brass, which is said by Pliny to be an accidental mixture of metal at the sack and burning of Corinth by Mummius the Roman, when the gold, silver, and brass statues, and all things made of metal, being melted and running together into low places, composed that mixed metal, which is of a much finer colour than common brass, and for its beauty hath been esteemed little inferior to gold. But some refiners, who have strictly examined this metal, can find no gold in it; and therefore justly look upon this account to be fabulous. Whether it was a mixed or simple metal, is not now known. If it was mixed, we have not been able to find so beautiful a composition; if simple, probably the mines that produced it have been long since exhausted.

There are also some medals composed of two different metals, not by melting them together, but either

Medal.

by plating over brass or iron with silver (a sort of false money that had its rise in the triumvirate of Augustus), or by laying a rim of a different metal round the edge of a medal. Medals of this sort, which are all of the larger size, are called by the antiquarians *contorniali*, from which is derived the French word *contour*, signifying the outline that determines and defines a figure. It cannot be supposed these were ever intended for common coin, because the workmanship of them would come to more than they would be worth in currency. Nor are they supposed to be very ancient: Father Hardouin allows them no higher antiquity than the 13th century; others date them from the fifth; and others make them as ancient as the time of Nero.

Secondly, The size of the ancient medals is from three inches to a quarter of an inch. Those of the larger size, or volume, as the medalists express it, some of which weigh two ounces and a half, are called *medallions*: of which sort scarcely any are to be met with in gold, few in silver, but many in copper. These are not supposed to have ever been current coin; but to be struck on such particular occasions, and for such purposes, as our modern medals are. As to the size of other medals, there is almost an endless variety betwixt the greatest and the least. However, they are ranked in three classes, viz. large, middle, and small; though it is sometimes difficult to assign a particular medal to its proper class. The class of a medal is not so much determined by its breadth and thickness, as by the head that is stamped upon it. So that in case one of the first size for breadth and substance bears a head no bigger than one of the middle size, or *bronze* as they call it, it is to be ranked in the middle class.

Thirdly, The shape of medals is round, or rather roundish; for the ancients had not the way of making their money so perfectly round as ours. The two sides or tables of the medal are distinguished into the face and the reverse; the face bearing the chief figure, as the portrait of some emperor, or other illustrious person: the reverse, some emblem, inscription, or other device, of which we shall treat further on.

Medals may be distinguished, 1. By the metal of which they are made. 2. By their different sizes. 3. By the nation to which they belonged. 4. By the ages in which they were struck.

The two former distinctions have been already considered; and as to the third, we propose to treat only of the Greek and Roman medals, and chiefly of the latter. Here again it will be convenient to distinguish medals into two classes, viz. those of the state, and those of particular cities and colonies: for, besides the money coined by the state, it appears, that divers cities and colonies had the privilege of coining; where it is probable the chief magistrate was the mint-master. Father Hardouin has published a large catalogue of Grecian and Roman medals of this sort, in a quarto volume, intitled, *Nummi antiqui populorum et urbium illustrati*: which is a valuable work; but it would have been much more entertaining and useful, if he had explained the devices and inscriptions of all the medals in his catalogue, as he has done of some of them. However, this Mr Vaillant has done in two volumes of the Latin colonies, in which he has

also given us cuts of the medals themselves.

Among the Roman colonies, some had *jus civitatis*, that is, the right of Roman citizens; which consisted in a capacity of standing for all offices of state, and of enjoying all other privileges of the citizens of Rome. Such a colony was called *municipium*. Of this kind was Philippi: therefore the Philippians call themselves *Romani*, Acts xvi. 21.: While other colonies, according to Ulpian, had little more than the name; enjoying only what they call *jus italicum*, or *jus Latii*; that is, they were free from the tributes and taxes paid by the provinces, and were capable of serving in the Roman legions. The former were more properly called *colonies*; the latter, only *free cities*.

The medals belonging to cities were so numerous, that above 200 may still be collected of the Greek cities only. Nay, not only had several cities, both among the Greeks and Romans, the privilege of coining money, but generals of armies frequently did it for the speedy payment of their troops. And it should seem by a passage of Suetonius, in his life of Tiberius, cap. 49. that this liberty was sometimes granted to private persons; for he there speaks of *Veretes immunitates, et jus metallorum et vestigalium pluribus civitatibus et privatim adempta*. But may it not admit of a query, whether the coins thus privately struck were intended as money for public use, or only for such purposes for which medals among us are often struck by private hands. And if the latter be the case, we can the better account for the vast variety of devices and mottos we find upon medals of the same reign, and why so many of them appear without any of those marks of public authority which others have.

4thly, Medals are ranked in different classes according to the ages when they were struck, as the time of the kings, the consuls, and the emperors.

1. Of the first sort, viz. medals of the kings, we have a great many Greek ones; of which M. Vaillant has given us a catalogue, with cuts of above 120 of them. Those of the kings of Macedonia yield in nothing to the most exquisite workmanship of the Romans. There are also coins still extant, of the kings of Pontus, Cappadocia, Bithynia, and many others. But we have no Roman medals struck in the time of their kings; though many with their portraits upon them. These were struck by their descendants in after-ages, in honour of their royal ancestors, and in order to eternize the nobility of their own families. Thus we have a medal of Ancus Marcius, the fourth king of Rome, which was struck by L. Marcius Philippus, one of his descendants, who was consul U. C. 662, about 500 years after the death of Ancus.

2. Consular medals, or those that were struck during the government of the consuls, from the expulsion of Tarquin the last king, to the beginning of the empire under Julius Cæsar, containing the space of 494 years.

The number of Roman medals still extant, supposed to have been struck in this interval, amount to about 1500; most of them silver, and of the smaller size; for of this class we do not find above 50 or 60 in gold, and hardly more than 250 in copper; of which metal there are indeed some of all the three sizes.

As the consular medals have transmitted to us the names of several Roman families, they are called *famili-*

Medal.

Medal.

*mily-medals.* Some supposed these names to be those of the consuls, under whose respective government the medals are coined. But that does not seem to have been the case: for we have no medals that bear the name of the first consuls for more than 200 years. And as for those which bear the name of such persons as we learn from the *Faffi* were consuls, yet they do not seem to have been struck in the time of their consulship; for we have often the letters Q. or P. after the name, signifying *quæstor* or *prætor*, (which was an office incompatible with the consulship,) and sometimes *triumvir*: these names therefore were more probably, either the names of the triumviri, who coined the pieces; or of their illustrious ancestors, many of whom had been consul, whose names and memory they endeavoured by this means to perpetuate.

The consular medals are reckoned to be the most ancient of the Roman coins now extant; and yet those of copper and silver are not supposed to be more ancient than the 484th year of Rome, nor those of gold than the year 546. Whatever medals, therefore, are produced of an older date, are looked upon as spurious.

2. Imperial medals, down from Julius Cæsar, (who put an end, though not to the name, yet to the power of the consuls) to the end of the Roman greatness, are distinguished into those of the Higher and Lower empire: the Higher Empire being reckoned from Julius Cæsar to the 30 tyrants inclusively, or at farthest to the end of the third century of the Christian æra; the Lower Empire from thence to the end of the ninth century, none latter being accounted ancient. Nor are the classes of modern medals reckoned to begin till the 15th century. As for those that were struck in the intermediate ages betwixt the 9th and the 15th, they are so extremely rude and barbarous, that they deserve no regard. It was not till the 13th century that the curiosity of medals, either as to the making or study of them, began to revive; being first set on foot by certain painters, Pisani, Bolduc, and others. Towards the middle of that age some medals were struck with considerable elegance both of design and relief; as one of Ferdinand king of Arragon, anno 1449; and another of John emperor of Constantinople, ten years before. But to return to the ancient medals.

The gradual declension of the Roman taste and politeness is in nothing more sensible than in its coins; which in the time of the Lower Empire, in comparison of what they had been formerly, grow to be very mean. The bulk and size is thin and small; the relief flat and low, and without any thing of that elegance we so justly admire in the device and inscriptions of those which were struck in the time of the Roman greatness. So that after medals came to be regarded and studied by the moderns, few persons troubled themselves with collecting those of the Lower Empire; until, by being neglected, some of them are become scarce, and on that account valuable. The whole number of different imperial medals, still extant, is reckoned by F. Joubert to be about 1000 or 1200 of gold, about 3000 of silver, and 6000 or 7000 of copper and brass.

The two tables or faces of medals are distinguished into the *face* and *reverse*; each of which usually bears a

figure and inscription: sometimes, indeed, you have a figure without any inscription; and sometimes an inscription without any figure.

The circular inscription near the edge of a medal is called the *legend*. That on the face commonly contains the names, titles, offices, &c. of the person whose head it bears: That on the reverse, either some motto, referring to the virtues of the person to whose honour it was struck, to some great action which he has performed, or to the benefits which the public had reaped by him; or else, the legend is the name of some virtue, or deity, represented by the figure; or of some province, or country, represented by some symbol or emblem. Yet this distinction betwixt the two legends does not hold universally; for sometimes we find the titles occupying both tables, and sometimes the motto. I have said the legend is the circular inscription near the edge of the medal; but this is to be understood only in the general: some legends being placed in a right line, either above or below the figure; or part above, and part below; or upon the figure itself; and in several other forms, according to the fancy of the workman. The Latin legends are all read from the left to the right; but the legends of some Greek medals are wrote the contrary way, from the right to the left. The letters on the circular legends are commonly placed with the bottoms inward; but sometimes with the bottoms toward the edge.

Besides the two legends, there is on many medals a short inscription upon the figure on the reverse, called the *exergum* or *exergue*, as being ἐξ ἔργου, "out of the work," from which it is frequently separated by a line over it. This exergue contains sometimes the date of the coin, expressing in what consulship of the emperor it was struck, as C O S. III. upon the reverse of Antoninus. Sometimes it signifies the place where it was struck, and to which the coin properly belonged, as S. M. A. L. for *Signata moneta Alexandria*, upon the reverse of Licinius: sometimes the name of a province, the reduction of which the medal is designed to celebrate; as *Judea*, in the reverse of Vespasian. Sometimes S. C. is put in the exergue; and sometimes other letters, which the modern medallists are not able to explain. Besides the legends and exergue, you often meet with other letters on the table, or field; as the S. C. on the Roman medals; L. on Greek medals, with some other letter or letters expressing the date. The Roman L being the ancient Greek Λ, is here said to stand for ΛΟΚΑΓΓΕΙΟΝ, a poetical word for *anno*.

Let us now attend to the figures we see on ancient coins.

1st. On the face, where we commonly have the portrait of some great and illustrious person; usually, if not always, in profile. The consular medals have commonly the heads of some of their gods; or of their ancient kings; or of Rome, which is a manly face wearing a helmet to express her warlike genius, and winged to denote her speedy and extensive conquests. The heads of the Roman kings are for the most part dressed with a diadem: which was nothing more than a fillet bound round the head, the ends of which, being tied in a knot behind, fell down upon the neck. — This was the proper badge and ornament of kings, and was never worn by any of the emperors till after

Con-

Medal.

Impression  
and form.



Medal. Constantine, when it was enriched with pearls and diamonds.

Julius Cæsar was the first among the Romans who struck his own head upon the coin, in which he was followed by all the succeeding emperors. The proper dress of the imperial head is a crown, for the most part of laurel; the right of wearing which was decreed to Julius Cæsar by the senate, and afterwards continued to his successors. Besides these, several other crowns, of different fashions, are found on medals; such as the rostral crown, composed of the prows of ships, which was given upon a naval victory: The mural crown, composed of towers; the reward of such as had taken cities, and also the ornament of their tutelar deities: Crowns of rays were bestowed on princes when they were deified, either before or after their death; as being properly the ornament of the gods: Some have supposed the Gentiles took the hint of these radiated crowns from some tradition of the shining of Moses's face, which is mentioned, Exod. liv. 29.; and this phenomenon they conceived of as occasioned by beams or rays of light darting from his head. Indeed this seems to have been likewise the notion of the Vulgate translator, who renders the word כֶּרֶן, *cornuta*; not, surely, imagining that Moses was really horned, but that he appeared with rays of light, like horns, emitted from his head.

The emperor Julianian was the first who used an arched crown, surmounted with a cross; such as is worn by Christian kings at this day. Some heads of emperors are wholly naked; there are such of Augustus, Nero, Galba, and some others: Though more commonly a naked head, struck in the imperial ages, is a sign that it is not the head of an emperor, but of one of his sons, or the presumptive heir of the empire.

The heads of the gods are distinguished by their proper crowns; as a crown of ears of corn is a symbol of Ceres; a crown of flowers denotes Flora; a crown of vine-leaves or ivy is the dress of Bacchus; the petasus, or hat with two wings, belongs to Mercury; the hat without brims is the mark of Vulcan, &c.

Heads are not only distinguished by their dress, but sometimes by certain symbols attending them; as when we see the *lituus*, or augural staff, placed by the head; which is the symbol of the pontifex maximus. But such symbols are more commonly found on the reverse, which we shall treat of hereafter.

The ancient coins present us not only with the portraits of kings and emperors, and other great men; but also of queens, and other ladies of high rank, chiefly the wives of the emperors. This honour of having their heads stamped on the coin, was done them either in their lifetime, or after their death; as on occasion of their *apotheosis*, or consecration, signified by peacocks on the reverse. The face of some medals is charged with two heads, which are either set face to face, as on the medals of Severus and the empress Domna; or back to back, as on the medal of Julius Cæsar and Octavianus (afterwards called Augustus) his adopted son and successor; struck by the Colonia Nemausensis, in honour of Augustus, upon his defeating Mark Antony and Cleopatra, whereby he subdued all Egypt to the Roman

power, signified by the device of a crocodile chained to a palm-tree. Some are stamped with three heads, or more, on the face; but these are very uncommon.

We have observed before, that the titles are generally upon the face of the medal; and we now proceed to consider them more particularly.

The titular addition to the proper name of the person whose head the medal bears, usually consists, partly, of mere titles of honour; such as *Imperator*, *Cæsar*, *Augustus*, given to all the Roman emperors after Octavianus. The title of *Augustus* was first decreed to him by the Roman senate, and was assumed by all his successors, as *Augusta* was by their wives. *Cæsar* was originally the cognomen of the first Roman emperor C. Julius Cæsar; who, by a decree of the senate, all succeeding emperors were to bear. But when the title *Augustus* was conferred upon his immediate successor, the title *Cæsar* was given to the second person of the empire, as to the presumptive heir of the crown; notwithstanding it still continued to be applied to the emperor himself. Hence we see the difference betwixt *Cæsar* used simply, and *Cæsar* with the addition of *Imperator Augustus*.

*Imperator* was originally an appellation with which the soldiers complimented a victorious general; but it afterwards came to denote the supreme commander, or head of the empire. However, when we find a number added to *Imperator*, as IMP. III. or IIII. it signifies that he had acted as general in the army, and had been saluted *Imperator* by the soldiers, as many times as the number expresses.

In the lower empire, the title *Dominus* was first assumed by Aurelian, and used by his successors; on whose coins we often see the legend begin with D. N. for *dominus noster*. Other titles, affixed to proper names, are a sort of surnames, which the person's virtues are supposed to have gained him: as *Pius*, a title first given to Antoninus; which Commodus also assumed, and added *Felix* to it; for which a thousand abuses were passed upon him. Again, *Pater Patriæ* was a title first bestowed on Cicero, for his discovering and defeating the conspiracy of Catiline; and was afterwards assumed by the emperors. Pescennius took upon him the surname of *Justus*; and Dioclesian, those of *Beatissimus* and *Felicitissimus*; Trajan had the titles *Optimus* and *Clemens* decreed him by the senate. Constantine called himself *Maximus*; and Victorinus affected the title of *Inuictus*. Other titles, again, are the names of offices; as *Consul*, which, in the time of the emperors, was little, if any thing more than a mere name: however, the people were fond of keeping it up, accounting it some remains or memento of their ancient liberty; and therefore the emperors submitted to be chosen consuls by the people. The number which we often see added to COS. signifies how many times the person had been thus elected: yet it is plain this election was not always made annually, as in the time of the proper consuls; for the emperor Hadrian's medals have for several years together COS. III. upon them.

Another title of office is *Tribunitia Potestas*; which, in the time of the Roman commonwealth, was the highest authority; for the tribunes of the people had power to annul the decrees of the senate, and nothing could

Medal.

could be concluded without their consent: nay, they have sometimes called the consuls and dictators to account for their conduct before the people.—This power and title was first assumed by the emperor Augustus; and afterwards, generally, by his successors.

The year of the tribuneship is commonly expressed after the title, as TRIB. POT. X. or XVI. &c. which yet does not always denote the year of the emperor's reign: for sometimes, though rarely, this power was given to another besides the emperor; as to the presumptive heir of the empire. Hence it is that the year of the TRIB. POT. expressed in the title, is sometimes a much higher number than the year of the emperor's reign. Thus Vespasian gave the *Tribunitia Potestas* to his son Titus, two years after he was made emperor. We therefore see on the medals of Titus, TRIB. POT. X. or XV. though he reigned but three years after his father. Other examples of the same kind occur in Marcus Aurelius, Caracalla, Geta, &c. The office of *Pontifex Maximus* was also constantly assumed by the Roman emperors, and generally expressed among their titles, from Augustus down to Constantine, by whom it was refused. It was afterwards reassumed by Julian, but quite laid aside by Gratian; after whom no emperor has P. M. in his titles. Julius Cæsar assumed the title of *Dictator Perpetuus*. Claudius took upon him the office of *Censor*, and Domitian made himself *Censor Perpetuus*; as appears upon their coins.

It is to be observed, that these names and titles are expressed in different cases. Sometimes in the nominative case, as Cæsar Augustus. Sometimes in the genitive, as *Divi Julii*: which case is chiefly used in the Greek medals, as ΒΑΣΙΛΕΥΣ ΑΛΕΞΑΝΔΡΟΥ; as if *ἱκανὸν* or *τοιοῦτον* was understood; that is, the image or coin of Alexander. Sometimes the name is put in the dative case; as IMP. *Nervæ, Trajano, Germanico*, &c. It is rarely put in the accusative, in the Latin; though there is an instance of that sort in a medal of Gallienus, inscribed *Gallienum Augustum*; but it is more common in the Greek.

The titles are hardly ever wrote at length, but contractedly, by one or more of the initial letters of each word; as A. U. G. for *Augustus*; C. Æ. S. for *Cæsar*; C. Æ. S. S. for *Cæsares*; C. Æ. S. S. for *Consules*; P. P. for *Pater Patriæ*; P. F. for *Pius Felix*, &c. Mr Patin, in his *Historia Numismatum*, hath given us a table of Roman abbreviations used on medals; which Mr Evelyn, in his *Namismata*, hath somewhat enlarged. You have also a table of a great number of these abbreviations at the end of Ainsworth's and Littleton's Dictionaries.

Secondly, We proceed to take a view of the reverse of medals, in which the chief erudition of this science lies.

Of these there is such a vast variety, especially of the imperial medals, that one is at a loss which to single out for a specimen of the whole. As for the consular medals, which we shall treat of in the first place, the same reverse is common to many of them; as Castor and Pollux on horseback, which is said to be the reverse that was first in use; then of Victory, or one of the gods, or the person to whose honour the

medal was struck, driving a chariot with two or four horses, whence the Denarii with these reverses were distinguished into *bigati* and *quadrigati*. The *ratii* also, or ship, or perhaps the prow of the ship, as the emblem of the naval power, was no uncommon reverse on the consular coins; whence the pieces with this impression were called *ratii*. Besides these, such consular medals as bore on the face the impress of their ancient kings, often preserved on the reverse the memory of some worthy action they had performed; as that of king Ancus has, on the reverse, the famous Aqueduct, with the equestrian statue upon it, by which the aqua marcia was brought nine miles to Rome, and which was begun by this Ancus. Medals struck on the occasion of founding colonies, have sometimes, on the reverse, a priest following a yoke of oxen, and perhaps with a plough, signifying the manner in which the boundaries of the colonies were marked out; or some say the oxen are designed to intimate, that the colony was planted by the common people, whereas the trophies we sometimes see on the reverses of these medals signify they were planted by the veteran soldiers.

The reverses of imperial medals are so different and various, according to the humours or fancies of the princes or mint-masters by whose direction they were struck, that one knows not how to range them into any class or order. However, the chief of them may be reduced to three heads, viz. figures, or personages; public monuments, or buildings; and inscriptions.

1. The figures or personages, which we so commonly see on the reverses of medals, are sometimes of princes; sometimes the same in miniature, whose portrait is more at large on the face: as on the reverses of the emperors of the family of Constantine, one often sees the emperor standing with a labarum in his right hand, and a globe surmounted with a Victory in his left. The labarum was the imperial standard, embroidered and set with precious stones; which in the time of the Christian emperors, instead of an eagle formerly embroidered upon it, had the monogram of Jesus Christ; viz. the two first letters of the word *ΧΡΙΣΤΟΣ* expressed in a cipher thus ☩. Sometimes the emperor appears in the reverse, dignified under the figure of some god; as on the reverse of a Dioclesian, who had assumed the name of *Jovius*, he appears in the figure of Jupiter sitting in a chair with a globe in his hand surmounted with a Victory: the legend, Jovī, H. U. CC. i. e. *Hoc voluerunt consules*. Sometimes the figure on the reverse, is some relation of that on the face; as Augustus on the reverse of Julius, and Claudius on the reverse of his mother Antonia. We sometimes see on the reverse the figure of some god, either of him to whose worship the emperor was more especially devoted; or of him whose protection and blessing was in a peculiar manner supplicated for him: as Minerva on the reverse of a Domitian; and on the reverse of a Mar. Aurelius, the goddess Salus, with a patera in her hand, sacrificing to Æsculapius, who was worshipped in the form of a serpent. Again, the virtues for which the emperor was or desired to be celebrated, are not uncommonly expressed by the figures on reverses; as Virtue, or Courage, on the reverse of a Domitian, represented

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by a bold armed woman with a spear in her right hand and a parazonium in her left; the legend, *Vir-tuti Augulli*. Liberty on the reverse of a Commodus, carrying in her right hand the cap of liberty, and in her left the wand called *rudis vindicta*, which was laid on the head of a slave when he was made free: *Equity*, on the reverse of a Vespasian, with a spear in her right hand and a balance in her left.

The virtues of the ladies are also celebrated on the reverses of their medals; as *Piety* on the reverse of a Faustina, in the habit of a vestal virgin, strewing frankincense on an altar; *Fecunditas* on the reverse of another medal of the same lady: *Spes Reipublicæ* on the reverse of Maxima Fausta, second wife of Constantine the Great; expressed by a female figure, with a helmet on to represent the Republic, and two children at her breasts. Mr Addison has given us a collection of these sorts of figures in his first Series.

Provinces are also represented by figures and personages; to signify either the emperor's conquests, or his care of them: as *Judea*, on the reverse of a Vespasian, sitting in a melancholy posture at the bottom of a pillar adorned with trophies, to signify her captive state. *Dacia*, on the reverse of Hadrianus, sitting on a rock, holding an eagle in her right hand, and a branch in her left. *Italia*, on the reverse of Commodus, with a cornucopia in her right hand, to denote her fruitfulness; a crown of towers on her head, to figure out the many cities that stand upon her; a sceptre in her left hand, and sitting on a globe, to shew she is sovereign of nations. See a collection of these sort of figures in Mr Addison's third Series.

Sometimes the figure is intended to immortalize some worthy action of the emperor. As his enriching the nation, or his care about the public coin, is signified, on the reverse of a Domitian, by the goddess *Moneta*, with a cornucopia in her left hand, and a balance in her right. On reverses we have not only a variety of single figures; but sometimes two, three, or more; as *Honos* and *Virtus* on the reverse of Galba, in Mr Addison's first Series, medal the second. And on a medal of Trajan's are seen three kings, and the emperor crowning them. On one of Hadrian's there are eight figures, but without any legend to explain them; and on one of Commodus there are ten.

Before we dismiss this head concerning the figures of medals, it will be proper to take notice of other animals, often met with on reverses, which have also their signification; as the eagle and the peacock denote the consecration of princes and princefesses, when they are admitted into the number of the gods; the crocodile is the symbol of Egypt; a serpent, of Æsculapius; Arabia is marked by a camel; Spain by a rabbit, (a creature which abounds in that country); Mauritania is known by a horse and switch, signifying the swiftness of its couriers; elephants in trappings are to be seen on the reverse of an Antoninus Pius and a Severus, which imports that these emperors procured those creatures to entertain the people at the public shows. We have also fabulous animals and monsters; as the griffon on the reverse of a medal of Gallienus; a centaur on another of the same emperor; and a phoenix on some medals of Constantine and his sons; to denote, what it seems they hoped for and expected, the perpetuity of the

Empire.

2. The second sort of reverses are public monuments and buildings; as the temple of Janus shut, on the reverse of a Nero, to signify the universal peace he gave to the empire; the macellum, (or a view of the shambles which he caused to be built for the convenience of the public), on another of the same emperor; the sumptuous bridge which Trajan built over the Tiber, adorns the reverse of one of his medals; the amphitheatre of Titus, and his naval column, are to be seen on his. The port, or gate of a city, which is found on the reverse of some medals, with the legend *PROVIDENTIA AUGUSTI*, or *CÆSARIS*, is a monument of the emperor's munificence, and care in providing a magazine of corn for the people in a time of scarcity. If a star appears over the gate, it denotes Constantinople. Such a reverse we have on the emperor Constantinus junior, the legend *PROVIDENTIE CÆSS*.

2. The third sort of reverses are inscriptions on the table or field of the medal. Of this sort there are several Latin and Greek imperial medals, which have nothing on the reverse but S. C. or Δ. Ε. for *Σανκτου Κρηστος Ανεως*, inclosed in a crown. Others set forth great occurrences, as *VICTORIA GERMANICA*, IMP. VI. COS. III. on the reverse of M. Aurelius. Others have titles of honour granted to the princes; as S. P. Q. R. *OPTIMO PRINCIPI*, on the reverse of a Trajan, and also of an Antoninus Pius. Other inscriptions have respect to public vows, which were made for the emperor every ten years; or (sometimes in the lower empire) every five years; which, according to Mr Du Cange, had their rise from Augustus's pretending to be desirous of quitting the empire: but, at the request of the senate, he twice consented to continue the government for ten years longer; upon which it became a custom at every ten years, to make public prayers, sacrifices, and games, for the preservation of the emperor. Hence we see on the reverse of a Constantius, *VOTIS XXX, MULTIS XXXX*. importing (probably) not only that he might reign 30 years, or 10 years more, from the time when the vows were made; namely, when he had already reigned 20 years; but that they engaged to make new vows at the expiration of 30 years, that he might reign 40 years; for it cannot mean that he had reigned 30 years at the time when the vows were made, since he died in the 26th year of his reign. This custom lasted until Theodosius; after whom no such epocha is to be found.

Besides the reverses which we have ranged into these three classes, there are many others which cannot be reduced to any of them; such as Addison calls *riddles*. For instance, on the reverse of an Augustus, Mercury in the form of a Terminus, standing on a thunderbolt; which was probably intended for a rebus, to express the sense of that emperor's motto, *Festina lente*. The Terminus was a figure, without either arms, hands, or feet; signifying, says Polybius, that all quarrels and contentions about the limits and boundaries were determined. Instruments of religion were symbols of the *Pontifex Maximus*, and signified the piety of the prince on whose coin they were borne: thus upon a reverse of Nerva, we see the *lituus*, the *simpulum*, the *aspergillum*, &c. Two hands joining one another, holding two ears of corn, and a caduceus betwixt them,

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on the reverses of a Titus, import the good harmony and union between the prince and the public; the peace arising from such an union, and the plenty which is the fruit of such a peace. See a collection of this sort of reverses in Addison's second Series.

The value of medals, in common computation, is rated not by the metal, or size, nor merely by their antiquity, but by their rarity. The metal is of so little consideration, that a copper medal is sometimes valued at a much higher rate than a silver or a gold one: for instance, the copper Otho, of the larger size, called a *singular medal*, because there is supposed to be but one, or however very few of them in the world, is of almost inimitable value; while a gold one shall not sell for above two or three guineas more than its weight: and if a piece of king Numa's leather money could now be found, it would, no doubt, be valued above any gold one. Such a *singular coin* is a silver Greek medallion of Peseennius, which is in the French king's cabinet. Hence the medals of those emperors who reigned a shorter time, are generally more valued than those that reigned longer; because there were fewer of them struck, and they are therefore the rarer. Yet sometimes an uncommon reverse shall give a great value to a medal, whose head, with another reverse, is very common.

In collecting of medals great caution is to be used that we are not imposed upon by counterfeits; especially of such medals as are scarce and rare. For that purpose we must attend to the field, and observe whether it is smooth, and free from marks of the sand which may commonly be seen on cast medals: to the letters and figures, which are never so sharp and clean in cast medals as in stamped ones; to the edges, to observe whether there be any marks of the file, which has been used in a cast medal, especially in that part where the metal ran into the mould. We are to observe again, whether there be any cracks in the edges; for though the absence of them be no certain sign of a counterfeit; yet, when they are found, they are looked upon as pretty good indications of the medal's being genuine. But nothing is more to be regarded than the colour and varnish, especially of copper medals; many of which have a certain inimitable varnish and politure; some green, some blue, others of a reddish brown; which, whether it was given them by art, or has been contracted by age, is not absolutely determined: though the latter seems more probable, since all the art of the falsifiers, whether by sal ammoniac, vinegar, burning paper upon them, burying them in the earth, or any other way, has by no means equalled it. There is indeed a green varnish which is commonly used for this purpose, that is pretty enough; but it is too bright and glaring; so that a little experience will enable a person to distinguish it from the antique.

Secondly, As to the use of ancient medals, besides a thousand little impertinences, as Addison calls them, that are very gratifying to curiosity, such as the dresses of the most celebrated ladies of antiquity, the flattering titles affected by this and the other emperor, and the honours he paid to his family and friends; they serve especially to represent, to us the features and lineaments of many illustrious personages. But besides these and many other like matters of mere, yet very

entertaining curiosity, they are capable of several more substantial uses; concerning which the learned Spanheim has published a large volume, *De Præstantia et usu Numismatum Antiquorum*: for instance, they are of very considerable service in history; for besides, that many facts and events not recorded by any of the ancient historians may be collected from them, they throw great light on several obscure passages in those writers. And indeed there is hardly any considerable event in the Grecian or Roman history, to which some reference may not be found in the coins of those nations. So that a cabinet of medals may be considered as in a manner a body of history; being conversant with which will fix historical facts and circumstances upon the memory with more ease, as well as give a greater degree of certainty concerning them than, books alone will ordinarily do.

Chronology receives not a little aid from medals, as they not only perpetuate the memory of illustrious actions, but often mark the year when they were performed.

Geography has been greatly beholden to this science, for ascertaining the names of ancient places; the founders of cities and colonies; and sometimes their situation, by their neighbourhood of some noted river, mountain, &c. expressed by some device on a medal.

By the help of medals we discover what honours and privileges certain cities were anciently possessed of. For instance, we learn from them what cities, besides Rome, had the privilege of Roman citizens. The honour of a city's being *νεωχώρα*, is celebrated on many Grecian medals; which imports that it had a temple in it, where the solemn sacrifices of the whole province were performed for their prince, and public games were exhibited to his honour, as often as his permission could be obtained for that purpose. Hence we see on some medals ΔΙΟ, ΤΡΙΟ, ΤΕΤΡΑΚΙΟ, &c. ΝΕΩΚΟΡΩΝ, for though the word *νεωχώρα*, derived from *νέω*, *templum*, and *χωρία*, *verro*, *purgo*, doubtless imported originally a mean office, namely, that of *sacristan*, or *sexton*; yet in time it came to be a term or title of honour, importing not only the celebration of the games (as we have said before), but also the religious devotion of a city to some deity: which sense it is applied to the city of Ephesus, *Αἰς* xix. 35. said to be *νεωκωρη της μεγαλης Θειας Αρtemιδος, και του Διουστινιου*; and therefore more properly rendered in that place *placitricem* in the vulgate, and *worshipper* in our English translation, than *adituum*, as in Beza and in some others.

We learn also from medals, in many cases, which was the chief city or metropolis of a province; and in what sense a city is called *πρωτη* when it was not the metropolis, as Philippi is said to be *πρωτη της μεριδος της Μακεδονιας πολις, κορωνια*, *Αἰς* xvi. 12. That Philippi was a Roman colony, appears from a medal struck in the reign of Claudius, with this legend, *COL. AUG. IVL. PHILIP.* that is *Colonia Augusta Julia Philippi*, or *Philippensis*. And in what sense this city was *πρωτη πολις*, though Thessalonica was undoubtedly the metropolis or chief city of the province, may be gathered from the use of the word *πρωτη*, as applied to several other cities on ancient coins: as in the pro-consular Asia, not only Ephesus was the chief city, but Smyrna and Pergamus, have the title *πρωτη*; and

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in Bithynia, not only Nicomedia, which was the metropolis, but Nicaea is also called *πρωτη*. Now, Spanheim shews, that this title, when thus applied to inferior cities, refers to the games which several cities joined in supporting, and of which one was the *πρωτη*. In this sense Philippi was the *πρωτη πολις*, (not *της επικρατειας*, but *της περιου*), of a particular district of Macedonia.

We have not yet mentioned all the arts and sciences which receive light and aid from medals. Sculpture and painting have revived, in later ages, along with this study; to which those arts are greatly indebted for noble hints and patterns. The same may be said of architecture, which now borrows its finest ornaments from the plans and models of ancient temples, ports, triumphal arches, and other public edifices, preserved on medals. Mr Addison has abundantly convinced us of their use to explain numerous passages in the classics. By their means the natural philosopher also acquaints himself with a great variety of foreign plants and animals. And the divine not only finds the usefulness of medals, for explaining and illustrating several texts of Scripture, as we have seen above; but hereby he informs himself of the ancient theology of the Greeks and Romans: here he sees the gods they worshipped, and their attributes expressed in significative emblems; here he sees their altars and adorations, and the instruments with which they performed their sacred rites. Upon the whole, therefore, though it cannot be denied that some persons have carried the study of medals to a ridiculous extravagance, yet it by no means deserves to be treated with the contempt it is by others, or to be wholly neglected.

*Impression of MEDALS.* See CASTING.

MEDALLION, or MEDALION, a medal of an extraordinary size, supposed to be anciently struck by the emperors for their friends, and for foreign princes and ambassadors. But, that the smallness of their number might not endanger the loss of the devices they bore, the Romans generally took care to stamp the subject of them upon their ordinary coins.

Medallions, in respect of the other coins, were the same as modern medals in respect of modern money: they were exempted from all commerce, and had no other value than what was set upon them by the fancy of the owner. Medallions are so scarce, that there cannot be any set made of them, even though the metals and sizes should be mixed promiscuously.

MEDE (Joseph), a very learned English divine of the 17th century, was educated at Cambridge, and soon distinguished himself to great advantage; for by the time he had taken the degree of master of arts in 1610, he had made an uncommon progress in all academical studies. His first appearance as a writer was by an address to Dr Andrews, then bishop of Ely, in a Latin tract *De Sanctitate Relativa*, which was highly approved of by that prelate, who desired him to be his domestic chaplain. This Mr Mede very civilly refused; valuing the liberty of his studies above any hopes of preferment, and esteeming that freedom which he enjoyed in his cell, so he used to call it, as the haven of all his wishes. And indeed these thoughts had possessed him betimes; for when he was a school-boy, he was sent to by his uncle, Mr Richard Mede, a merchant, who, being then without children, offered to

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adopt him for his son if he would live with him: but he refused the offer, preferring, as it should seem, a life of study to a life of gain.

He was not chosen fellow of his college till after he was master of arts, and then not without the assistance of his friend bishop Andrews: for he had been passed over at several elections, on account of a causeless suspicion which Dr Cary, then master of the college, afterwards bishop of Exeter, had conceived of him, that "he looked too much towards Geneva." Being made fellow, he became an eminent and faithful tutor. After he had well grounded his pupils in humanity, logic, and philosophy, so that they were able to walk as it were alone, he used to set every one his daily task; which he rather chose, than to confine himself and them to precise hours for lectures. In the evening they all came to his chamber; and the first question he put to each was, *Quid dubitas*? "What doubts have you met with in your studies to-day?" For he supposed, that to doubt nothing and to understand nothing was just the same thing. This was right, and the best method to make young men exercise their rational powers, and not acquiesce in what they learn mechanically, and by rote, with an indolence of spirit which prepares them to receive and swallow implicitly whatever is offered to them. As to himself, he was so entirely devoted to the study of all excellent knowledge, that he made even the time he spent in his amusements serviceable to his purpose. He allowed himself little or no exercise but walking; and often, in the fields or college garden, would take occasion to speak of the beauty, signatures, virtues, or properties of the plants then in view: for he was a curious florist, an accurate herbarist, and thoroughly versed in the book of nature. The chief delight he took in company was to discourse with learned friends.

Mr Mede was a curious inquirer into the most abstruse parts of learning, and endeavoured after the knowledge of those things which were most remote from the vulgar track. Among other things, he spent no small pains and time in sounding the depths of astrology, and blotted much paper in calculating the nativities of his near relations and fellow-students: but this was in his younger years, and he afterwards discovered the vanity and weakness of this fanciful art. He applied himself to the more useful study of history and antiquities; particularly to those mysterious sciences which made the ancient Chaldeans, Egyptians, and other nations, so famous; tracing them, as far as he could have any light to guide him in their oriental schemes and figurative expressions, as likewise in their hieroglyphics, not forgetting to inquire also into the oneirocritics of the ancients: which he did the rather, because of that affinity he conceived they might have with the language of the prophets. He was a curious and laborious searcher of antiquities relating to religion, ethnic, Jewish, Christian, and Mahometan: to which he added other attendants, necessary for understanding the more difficult parts of Scripture.

In 1620, he refused the provostship of Trinity-college, Dublin, into which he had been elected at the recommendation of archbishop Usher, who was his particular friend; as he did also when it was offered to him a second time, in 1630. The height of his ambition was, only to have had some small donative sinecure

Medes,  
Media.Media  
Mediate.

cure added to his fellowship, or to have been thrown into some place of quiet; where, retired from the noise and tumults of the world, and possessed of a competency of fortune, he might have been intirely at leisure for study and acts of piety. In the mean time, although his circumstances were scanty, for he had nothing but his fellowship and a college lecture, his charity was diffusive and uncommon; and, strange as it may now seem, he devoted the tenth of his income to pious and charitable uses. But his frugality and temperance always afforded him plenty. His prudence or moderation, either in declaring or defending his private opinions, was very remarkable; as was also his freedom from partiality, prejudice or prepossession, pride, anger, selfishness, flattery, and ambition. He was meek, patient, equally remote from superstition and licentiousness of thinking; and, in short, possessed every virtue. This great and good man died in 1638, in his 52d year, having spent above two-thirds of his time in college.

MEDEA, in fabulous history, daughter of Aetæus king of Colchis, who possessed the golden fleece, A. M. 2741. She fell in love with Jason, helped him to the fleece, and then went away with him. She is said to have been a great sorceress, and by her art restored the age of Æson her father-in-law. Jason afterwards forsaking her, in revenge he married Egæus; but was banished Athens, of which he was king.

MEDIA, now the province of GHILAN in Persia, once the seat of a potent empire, was bounded, according to Ptolemy, on the north by part of the Caspian Sea; on the south by Persis, Susiana, and Assyria; on the east by Parthia and Hyrcania; and on the west by Armenia Major. It was anciently divided into several provinces, *viz.* Tropatene, Charomithrene, Dairites, Marciane, Amariace, and Syro-Media. By a later division, however, all these were reduced to two; the one called *Media Magna*, the other *Media Atropatia*, or simply *Atropatene*. Media Magna was bounded by Persis, Parthia, Hyrcania, the Hyrcanian Sea, and Atropatene, and contained the cities of Ecabtan, Laodicea, Apamea, Raga, Rageia, or Ragea, &c. Atropatene lay between the Caspian mountains and the Caspian Sea.

This country originally took its name from Madai, the third son of Japhet; as is plain from Scripture, where the Medes are constantly called *Madai*. Among profane authors, some derive the name *Media*, from one Medus the son of Jason and Medea; others from a city called *Media*. Sextus Rufus tells us that in his time it was called *Medena*, and from others we learn that it was also called *Aria*. The most probable history of the Medes is as follows.

This people lived in subjection to the Assyrians till the reign of Sennacherib, when they threw off the yoke, and lived for some time in a state of anarchy. But at last, rapine and violence, the natural consequences of such a situation, prevailed so much that they were constrained to have recourse to some kind of government that they might be enabled to live in safety. Accordingly, about 699 B. C. one Deioces having procured himself to be chosen king, united the scattered tribes into which the Medes were at that time divided, and having applied himself as much as possible to the civilization of his barbarous subjects, left the throne to

his son Phraortes, after a reign of 53 years.

The new king, who was of a warlike and enterprising disposition, subdued almost all the Upper Asia lying between Mount Taurus and the river Halys which runs through Cappadocia into the Euxine Sea. Elated with this good success, he invaded Assyria, the empire of which was now much declined, and greatly weakened by the revolt of many nations which had followed the example of the Medes. Nebuchodonosor, or Chyniladan, however, the reigning prince, having assembled what forces he could, engaged Phraortes, defeated, took him prisoner, and put him to death; after which, entering Media, he laid waste the country, took the metropolis of Ecabtan itself, and levelled it with the ground.

On the death of Phraortes, his son Cyaxares was placed on the throne. He was no less valiant and enterprising than his father, and had better success against the Assyrians. With the remains of that army which had been defeated under his father, he not only drove the conquerors out of Media, but obliged Chyniladan to shut himself up in Nineveh. To this place he immediately laid close siege; but was obliged to give over the enterprise on account of an irruption of the Scythians into his own country. Cyaxares engaged these new enemies with great resolution; but was utterly defeated; and the conquerors over-ran not only Media, but the greatest part of Upper Asia, extending their conquests into Syria, and as far as the confines of Egypt. They continued masters of all this vast track of country for 28 years, till at last Media was delivered from their yoke by a general massacre at the instigation of Cyaxares.

After this deliverance the Medes soon repossessed themselves of the territories they had lost; and once more extended their frontiers to the river Halys, their ancient boundary to the westward. After this we find the Medes engaged in a war with the Lydians; which, however, ended without any remarkable transaction; but on the conclusion of it, Cyaxares having entered into a strict alliance with Nebuchadnezzar king of Babylon, returned in conjunction with the Babylonians before Nineveh; which they took and levelled with the ground, putting most of the inhabitants to the sword.

After this victory the Babylonian and Median empires seem to have been united; however, after the death of Nebuchadnezzar, or rather in his lifetime, a war ensued, which was not extinguished but by the dissolution of the Babylonian empire. The Medes, under Astyages the son of Cyaxares I. withstood the power of the Babylonian monarchs; and under Cyrus and Cyaxares II. utterly destroyed their empire by the taking of BABYLON, as is related under that article. After the death of Cyaxares, the kingdom fell to Cyrus, by whom the seat of the empire was transferred to PERSIA, under which article the history of Media now falls to be considered, as also the manners, &c. of the inhabitants.

MEDIASINUM, in anatomy. See there, n° 377, d.

MEDIATE, or INTERMEDIATE, something that stands between and connects two or more terms considered as extremes; in which sense it stands opposed to *immediate*.

ME.



**MEDICAGO**, SNAIL-TREFOIL; a genus of the decandria order, belonging to the diadelphia class of plants. There are nine species, though only five are commonly cultivated in this country. They are low trailing plants, adorned with small yellow flowers, succeeded by small, round, snail-shaped fruit, which are downy, and armed with a few short spines. They are all easily propagated by seeds.

**MEDICATED WATERS.** See **WATER**; and **AIR**, Medicated, <sup>Medicinal.</sup>

**MEDICINAL**, anything belonging to medicine.

**MEDICINAL Springs**, a general name for any fountain, the waters of which are of use for removing certain disorders. They are commonly either chalybeate or sulphureous. See **SPRINGS**.

## M E D I C I N E.

**MEDICINE** is the art of preventing and curing diseases.

### HISTORY of Medicine.

This art is in itself so noble, and so generally useful to mankind, that many have thought it came originally from God by express revelation; and, accordingly, we find the heathens with one voice ascribing the origin of the medicinal art to their gods. Most people, however, are now of opinion, that it is of human invention; and that mankind were naturally led to it from casual observations on the diseases to which they found themselves subject.

At what time medicine was first reduced to rules, and began to be practised as an art, is not known. The most ancient physicians we read of were those who embalmed the patriarch Jacob by order of his son Joseph. The sacred writer styles these physicians *servants* to Joseph: from whence we may be assured that they were not *priests*, as the first physicians are generally supposed to have been; for in that age we know the Egyptian priests were in such high favour, that they retained their liberty, when, through a public calamity, all the rest of the people were made slaves to the prince.

It is not probable, therefore, that among the Egyptians religion and medicine were originally conjoined; and if we suppose this people not to have invented the art, but received it from some other nation, it is as little probable that the priests of that nation were their physicians, any more than those of Egypt already mentioned.

That the Jewish physicians were absolutely distinct from their priests is very certain. Yet as the Jews resided for such a long time in Egypt, it is probable they would retain many of the Egyptian customs, from which it would be very difficult to free them. We read, however, that when king Asa was diseased in his feet, "he sought not to the Lord, but to the physicians." Hence we may conclude, that among the Jews the medicinal art was looked upon as a mere human invention; and it was thought that the Deity never cured diseases by making people acquainted with the virtues of this or that herb, but only by his miraculous power; which indeed seems most becoming his exalted character. That the same opinion prevailed among the heathens who were neighbours to the Jews, is also probable from what we read of Ahaziah king of Judah, who having sent messengers to inquire of Baal-zebub God of Ekron concerning his disease, he did not desire any remedy from him or his priests, but simply to know whether he should recover or not.

What seems most probable on this subject therefore

is, that religion and medicine came to be mixed together only in consequence of that degeneracy into ignorance and superstition, which some time or other hath taken place among all nations. The Egyptians, we know, came at last to be sunk in the most ridiculous and absurd superstition; and then, indeed, it is no wonder to find their priests commencing physicians, and mingling charms, incantations, &c. with their remedies. That this was the case, tho' long after the days of Joseph, we are very certain; and indeed it seems as natural for ignorance and barbarism to combine religion with physic, as it for a civilized and enlightened people to keep them separate. Hence we see, that among all modern barbarians their priests or conjurers are their only physicians.

We are so little acquainted with the state of physic among the Egyptians, that it is needless to say much concerning them. They attributed the invention of medicine, as they did also that of many other arts, to Thoth, the HERMES or MERCURY of the Greeks. He is said to have wrote many things in hieroglyphic characters upon certain pillars, in order to perpetuate his knowledge, and render it useful to others. These were transcribed by Agathodemon, or the second Mercury, the father of Tat, who composed books of them, that were kept in the most sacred places of the Egyptian temples. The existence of such a person, however, is very dubious, and many of the books ascribed to him were accounted forgeries as long ago as the days of Galen; there is also great reason to suspect that these books were wrote many ages after Hermes, and when physic had made considerable advances. Many of his books are quite trifling and ridiculous; and though sometimes he is allowed to have all the honour of inventing the art, he is on other occasions obliged to share it with Osiris, Isis, and Apis, or Serapis.

After all, the Egyptian physic appears to have been little else than a heap of absurd superstitions. Origen informs us, that they believed there were 36 demons, or gods of the air, who divided the human body among them; that they had names for all of them; and that by invoking them according to the part affected, the patient was cured. Of natural medicines we hear of none recommended by the father of Egyptian physic; except the herb *moly*, which he gave to Ulysses in order to secure him from the enchantments of Circe; and the herb *mercury*, whose use he first discovered. His successors made use of venesection, cathartics, emetics, cure, and clysters. There is no proof, however, that this practice was established by Hermes; on the contrary, the Egyptians themselves pretended, that the first hint of these remedies was taken from some observations on brute

Physicians not originally priests.

How teller-  
gion and  
medicine  
came to be  
mixed to-  
gether.

Of the  
Egyptian  
physic.

Their shal-  
little else  
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brute animals. Venesection was taught them by the hippopotamus, which is said to perform this operation upon itself. On these occasions, he comes out of the river, and strikes his leg against a sharp-pointed reed. As he takes care to direct the stroke against a vein, the consequence must be a considerable effusion of blood; and this being suffered to run as long as the creature thinks proper, he at last stops up the orifice with mud. The hint of clysters was taken from the ibis, a bird which is said to give itself clysters with its bill, &c. They used venesection, however, but very little, probably on account of the warmth of the climate; and the exhibition of the remedies abovementioned, joined with abstinence, formed the most of their practice.

6  
Origin of  
wedi line  
among the  
Greeks.

The Greeks too had several persons to whom they attributed the invention of physic, particularly Prometheus, Apollo or Pæan, and Æsculapius; which last was the most celebrated of any. But here we must observe, that as the Greeks were a very warlike people, their physic seems to have been little else than what is now called *surgery*, or the cure of wounds, fractures, &c. Hence, Æsculapius, and his pupils Chiron, Machaon, and Podalirius, are celebrated by Homer only for their skill in curing these, without the least mention of their attempting the cures of internal diseases. We are not, however, to suppose, that they confined themselves entirely to surgery. They no doubt would occasionally prescribe for internal disorders; but as they were most frequently conversant with wounds, we may naturally suppose the greatest part of their skill to have consisted in knowing how to cure these. If we may believe the poets, indeed, the knowledge of medicine seems to have been very generally diffused. Almost all the heroes of antiquity are reported to have been physicians as well as warriors. Most of them were taught physic by the centaur Chiron. From him Hercules received instructions in the medicinal art, in which he is said to have been no less expert than in feats of arms. Several plants were called by his name; from whence some think it probable that he found out their virtues, though others are of opinion that they bore the name of this renowned hero on account of their great efficacy in removing diseases. Aristæus king of Arcadia was also one of Chiron's scholars; and is supposed to have discovered the use of the drug called *silphium*, by many thought to be a *asafetida*. Theseus, Ulysses, Jason, Pelæus, and his son Achilles, were all renowned for their knowledge in the art of physic. The last is said to have discovered the use of verdegripe in cleansing foul ulcers. All of them, however, seem to have been inferior in knowledge to Palamedes, who hindered the plague from coming into the Grecian camp after it had ravaged most of the cities of Hellefpont, and even Troy itself. His method was to confine his soldiers to a spare diet, and to oblige them to use much exercise.

8  
The practice  
of their  
ancient  
physicians  
improper.

The practice of these ancient Greek physicians, notwithstanding the praises bestowed on them by their poets, seems to have been very limited, and in some cases even pernicious. All the external remedies applied to Homer's wounded heroes were fomentations; while inwardly their physicians gave them wine, sometimes mingled with cheese scraped down. This last we know

must have been pernicious in many cases by increasing the inflammation; and it is very probable, that such an improper exhibition was merely a consequence of their ignorance; as we see old women in this country will give ardent spirits to those who are seized with inflammatory fevers, in order to prevent their patients from fainting. A great deal of their physic also consisted in charms, incantations, amulets, &c. of which, as they are common to all superstitious and ignorant nations, it is superfluous to take any farther notice.

In this way the art of medicine continued among the Greeks for many ages. As its first professors knew nothing of the animal economy, and as little of the theory of diseases, it is plain, that whatever they did must have been in consequence of mere random trials, or empiricism, in the most strict and proper sense of the word. Indeed, it is evidently impossible that this or almost any other art could originate from another source than trials of this kind. Accordingly, we find, that some ancient nations were accustomed to expose their sick in temples, and by the sides of highways, that they might receive the advice of every one that passed. Among the Greeks, however, Æsculapius, as he was reckoned the most eminent practitioner of his time, so his name continued to be revered after his death; he was ranked amongst the gods; and the principal knowledge of the medicinal art remained with his family to the time of Hippocrates, who reckoned himself the seventeenth in a lineal descent from Æsculapius, and who was truly the first who treated of medicine in a regular and rational manner.

At last, the Grecian philosophers attempted to introduce particular theories into the medicinal art. Pythagoras, who lived about the sixth Olympiad, and founded the Italic school, is the first we read of who began to take these things into consideration. He believed, that, at the time of conception, a certain substance descended from the brain, which contained a warm vapour, from whence the soul and all the senses derived their original; while the flesh, the nerves, tendons, bones, hair, and all the body in general, were made of the blood and other humours which meet in the matrix. According to him, the body of the infant was formed, and became solid in 40 days: but eleven, nine, or more generally ten months, according to the rules of harmony, were requisite to make him perfectly complete, and that all that happened to him during the whole course of his life was then regulated; and that he carried it along with him in a series or chain proportioned to the laws of the same harmony, every thing necessarily falling out afterwards in its own time. He asserted, that the veins, the arteries, and the nerves, are the cords of the soul. According to him, the soul spreads from the heart to the brain; and that part of it which is in the heart is the same from whence the passions proceed, whereas reason and understanding reside in the brain. This is what may be called the *Pythagorean physiology*; and if we please we may call the following his *pathology*. "The air (says he) is all filled with souls, or demons, and heroes, that send dreams, signs, and diseases to men, and even to beasts." As to his practice, we know of no other remedy he esteemed besides *cabbage*; all his other cures consisted of charms or other superstitions. His doctrine concerning abstinence from flesh are too well known.

9  
Art of medicine  
originally  
empiric.

10  
Pythagoras  
introduces  
his theory  
into medicine.

Heracilius's  
strange method of  
curing himself.

known, and too absurd to be insisted on here.

A short time after Pythagoras, the philosopher Heraclitus applied himself to the study of physic. The only patient of his we hear of was himself; and indeed, if we may judge of his practice by the method he took to cure himself, it seems to have been for the good of mankind that he had no more. Being a man of a very austere and morose temper, which occasioned the report that he always wept, he retired into a solitary place to avoid the conversation of mankind; where, living only upon water and herbs, he fell into a dropy. This obliged him to return to inhabited places, where he sent for physicians, not with a design to follow their advice, but to expose their ignorance to the world, and to make them witnesses of the cure he intended to perform upon himself. Accordingly, he shut himself up in a stable, where he covered all his body with dung, hoping by that means to consume the superfluous moisture in his entrails: but in this he did not succeed; for he died of the disease soon after.

This may be a sufficient specimen of the ancient philosophic medicine, of which we shall now take no farther notice, but proceed to give an account of the state in which the art was left by Hippocrates, whose name has been celebrated through so many ages. According to Soranus, Hippocrates was born in the island of Cos, in the first year of the 88th Olympiad; but others make him older, so that the exact time in which he lived cannot be ascertained.

Some books  
falsely attributed  
to him.

The works attributed to him are very voluminous, but evidently done by different persons, as many of them are contradictory to each other, so that it is difficult to determine those which are really his writings, and those which are not. Some indeed are so sceptical on this head, as to deny that we have proper evidence that any of those works really belong to Hippocrates, except a single aphorism. Be this, however, as it will, in most of the writings ascribed to Hippocrates, we find a general principle acknowledged which is called *nature*. To this principle he ascribes a mighty power. "Nature (says he) is of itself sufficient to every animal. She performs every thing that is necessary to them, without needing the least instruction from any one how to do it." Upon this footing, as if nature had been a principle endowed with knowledge, he gives her the title of *just*; and ascribes virtues or powers to her, which are her servants, and by means of which she performs all her operations in the bodies of animals: they distribute the blood, spirits, and heat, through all parts of the body, which by this means receive life and sensation. And in other places he tells us, that it is this faculty which gives nourishment, preservation, and growth, to all things.

He acknowledges one  
general principle  
called Nature.

This principle  
acts by attraction.

The manner in which nature acts, or commands her subversive powers to act, is by attracting what is good and agreeable to each species, and in retaining, preparing, and changing it; and on the other side in rejecting whatever is superfluous or hurtful, after she has separated it from the good. This is the foundation of the doctrine of depuration, concoction, and crisis in fevers, so much insisted upon by Hippocrates and most other physicians. He supposes also, that every thing has an inclination to be joined to what agrees with it, and to remove from every thing contrary to it; and likewise that there is an affinity between the several

parts of the body, by which they mutually sympathize with each other. When he comes to explain what this principle called *nature* is, he is obliged to resolve it into *heat*, which, he says, appears to have something immortal in it.

With regard to the anatomical doctrines of Hippocrates, as they must necessarily have been very erroneous, we shall not spend time in recounting them. The health or sickness of the body he reckoned to consist in the state of the four humours. These are the blood, phlegm, the yellow bile, and the melancholy or black bile. The blood, he says, is naturally hot and moist, of colour red, and sweet to the taste; the phlegm is cold and moist, white, viscid, and saltish; the bile yellow, dry, viscid, bitter, and drawn from the fat part of the blood or aliments; the melancholy, black bile, he said, was cold and dry, very viscid, windy, and fermentative.

On these four humours, as already mentioned, depend health and sickness. Men are well when the humours are in their natural state, or while they balance one another in quality, quantity, and mixture. On the contrary, they are sick when the quantity of any of these is less or greater than it ought to be, or when it is discharged from the rest upon any particular part of the body, and especially when they are not mixed together as they ought to be. Of sickness, however, he gives no definition except in one place, where he calls it *all that incommodes man*. He thought that the blood in good condition, nourished; that it was the fountain of the vital heat; that it caused a fresh colour, and good health. The yellow bile, he thought, preserved the body in its natural state, hindering the small vessels from being stopped, and keeping open the drain of the excrements: it also actuated the senses, and helped to the concoction of the aliment. The black bile was a sort of ground which served as a support and foundation for other humours. The phlegm served to lubricate and facilitate the motion of the nerves, membranes, cartilages, joints, and other parts.

Besides these four qualities of moisture, dryness, heat, and cold, which Hippocrates attributed to the humours, he believed that they had, or might have, abundance of others which all had their use, and were never hurtful but when one prevailed over the rest or was separated from them. In other passages, however, he assigns different causes for diseases. In one of his books, entitled, "Of winds, or spirits," he says, that the air and spirits are the true causes of health and diseases, even in preference to the humours, which are only collateral causes as the spirits mix with them. Hence, health and sickness in general are made to depend on the following causes, viz. On the air which surrounds us; on what we eat and drink; on sleep, watching, exercise; on what goes out of our bodies, and what is kept in; and upon the passions.

The four humours he compares with the four ages of man, with the four seasons, and with the climates. Infancy, the spring, and temperate countries, ought, according to him, to produce blood, and consequently more sanguine dispositions than bilious, pituitous, or melancholic ones. Youth, summer, and hot and dry countries, produce bile, and all the maladies which spring from it. Middle age, autumn, and places of a heavy unequal

His doctrine of the four humours of the body.

Health and sickness, how produced.

Different diseases, produced in different ages and climates.



19  
His direc-  
tions with  
regard to  
diet.

equal air, cause melancholy and melancholic distempers. Old age, winter, and cold moist countries, produce phlegm and phlegmatic distempers. He carefully examines what sorts of food produce blood, bile, &c. He treats also of the effects of sleep, watchings, exercise, and rest, and all the benefit or mischief we may receive from them. Of all the causes of diseases, however, mentioned by Hippocrates, the most general are diet and air. On the subject of diet he has composed several books, and in the choice of this he was exactly careful; and the more so, as his practice turned almost wholly upon it. He also considered the air very much; he examined what winds blew ordinarily or extraordinarily; he considered the irregularity of the seasons, the rising and setting of stars, or the time of certain constellations; also the time of the solstices, and of the equinoxes; those days, in his opinion, producing great alterations in certain distempers.

Hence it may be inferred that Hippocrates looked upon the knowledge of astronomy to be necessary to a physician, and believed that the stars had some influence over our bodies. Some of his ancient commentators also believed that he thought diseases were occasioned by the wrath of the gods. But these commentators are contradicted by Galen, who assures us, that when Hippocrates spoke of something *divine* in diseases, he meant no more than that the cause of them depended on some latent constitution of the atmosphere.

10  
Human  
body com-  
posed of  
three prin-  
ciples.

Hippocrates lays down three principles of which the human body is composed; viz. the solid, the liquid, and the spirits, which he sometimes explains by "that which contains," "that which is contained," and "that which gives the motion." By that which contains is meant the solid parts, as bones, nerves, tendons, ligaments, &c. By that which is contained, he means the four humours already mentioned; and by that which gives the motion, he means the spirits.—The humours and spirits being, as we have already seen, the causes of health and sickness, the solid or containing parts must be the subject of them; because they are found or unfound according to the good or ill disposition which the humours and spirits produce in them, and as the impressions made upon them by foreign bodies is beneficial or mischievous.

21  
His method  
of classing  
distempers.

He does not, however, pretend to explain how, from these causes, that variety of distempers arises which is daily to be observed. All that can be gathered from him with regard to this is, that the different causes above-mentioned, when applied to the different parts of the body, produce a great variety of distempers. Some of these distempers he accounted *mortal*, other *dangerous*, and the rest easily *curable*, according to the cause from whence they spring, and the parts on which they fall. In several places also he distinguishes diseases, from the time of their duration, into *acute* or *short*, and *chronical* or *long*: this likewise is referred to the different causes before mentioned; acute diseases being caught by the bile and the blood, in the flower of man's age, or in spring-time, and summer. The chronical ones, on the contrary, are produced by the phlegm, or melancholy, in old age, and in winter. He likewise distinguishes

diseases by the particular places where they prevail, whether ordinary or extraordinary. The first, that is, those that are frequent and familiar to certain places, he called *endemic* diseases; and the latter which ravaged extraordinarily sometimes in one place, sometimes in another, which seized great numbers at certain times, he called *epidemic*, that is, *popular* diseases; and of this kind the most terrible is the plague. He likewise mentions a third kind, the opposite of the former; and these he calls *sporadic*, or straggling diseases: these last include all the different sorts of distempers which invade at any one season, which are sometimes of one sort, and sometimes of another. He distinguished between those diseases which are hereditary, or born with us, and those which are contracted afterwards; and likewise between those of a *kindly* and such as are of a *malignant* nature, the former of which are easily and frequently cured, but the latter give the physicians a great deal of trouble, and are seldom overcome by all their care.

Hippocrates remarked four stages in distempers; viz. the beginning of the disease, its augmentation, its state or height, and its declination. In such diseases as terminate fatally, death comes in place of the declination. In the third stage, therefore, the change is most considerable, as it determines the fate of the sick person; and this is most commonly done by means of a *crisis*. By this word he understood any

21  
Remarks  
four stages  
in distem-  
pers.

sudden change in sickness, whether for the better or for the worse, whether health or death succeeded immediately. Such a change, he says, is made at that time by *nature*, either abolishing or condemning the patient. Hence we may conclude, that Hippocrates imagined diseases to be only a disturbance of the animal economy, with which Nature was perpetually at variance, and using her utmost endeavours to expel the enemy. Her manner of acting on these occasions is to reduce to their natural state those humours whose discord occasions the disturbance of the whole body, whether in relation to their quantity, quality, mixture, motion, or any other way in which they become offensive. The principal means employed by nature for this end is what Hippocrates calls *convulsion*. By this we can only understand the bringing the morbid matter lodged in the humours to such a state, as to be easily fitted for expulsion by whatever means nature thinks most proper. When matters are brought to this pass, whatever is superfluous or hurtful immediately empties itself, or nature points out to physicians the way by which such an evacuation is to be accomplished. The crises takes place either by bleeding, stool, vomit, sweat, urine, tumours or abscesses, scabs, pimples, spots, &c. But we must take notice that these evacuations are not to be looked upon as the effects of a true crisis, unless they are in considerable quantity; small discharges not being sufficient to make a crisis. On the contrary, small discharges are a sign that nature is depressed by the load of humours, and that she lets them go through weakness and continual irritation. What comes forth in this manner is crude, because the distemper is yet too strong; and while matters remain in this state, nothing but a bad or imperfect crisis is to be expected. This shews that the distemper triumphs, or at least

23  
A crisis,  
what.

is equal in strength to nature, which prognosticates death, or a prolongation of the disease. In this last case, however, nature often has an opportunity of attempting a new crisis more happy than the former, after having made fresh efforts to advance the concoction of the humours.—It must here be observed, however, that, according to Hippocrates, concoction cannot be made but in a certain time, as every fruit has a limited time to ripen; for he compares the humours which nature has digested to fruits come to maturity.

24  
Different times required for concocting the humours.

The time required for concoction depends on the differences among distempers mentioned above. In those which Hippocrates calls *very acute*, the digestion or crisis happens every fourth day; in those which are only *acute*, it happens on the seventh, eleventh, or fourteenth day; which last is the longest period generally allowed by Hippocrates in distempers that are truly acute: though in some places he stretches it to the twentieth or one-and-twentieth, nay, sometimes to the fortieth or sixtieth days. All diseases that exceed this last term are called *chronical*. And whereas in those diseases that exceed fourteen days, every fourth day is critical, or at least remarkable, by which we may judge whether the crisis on the following fourth day will be favourable or not; so in those which come from twenty to forty he reckons only the sevenths, and in those that exceed forty he begins to reckon by twenties; as appears by the following progression, which contains the days particularly marked by Hippocrates. He begins with the fourth; and then he proceeds to the eleventh, the fourteenth, seventeenth, twentieth, seven-and-twentieth, thirty-fourth, the fortieth, the sixtieth, the eightieth, the hundredth, and the hundred-and-twentieth. Beyond this last term the number of days has no power over the crisis. They are then referred to the general changes of the seasons; some terminating about the equinoxes; others about the solstices; others about the rising or setting of the stars of certain constellations; or if numbers have yet any place, he reckons by months, or even whole years. Thus, he says, certain diseases in children have their crisis in the seventh month after their birth, and others in their seventh, or even their fourteenth year.

Though Hippocrates mentions the one-and-twentieth as one of the critical days in acute distempers, as already mentioned; yet, in other places of his works, he mentions also the twentieth. The reason he gives for this in one of those places of his works is, that the days of sickness were not entire. In general, however, he is prodigiously attached to the odd days: inasmuch that in one of his aphorisms he tells us, "The sweats that come out upon the third, fifth, seventh, ninth, eleventh, fourteenth, seventeenth, twenty-first, twenty-seventh, thirty-first, or thirty-fourth days, are beneficial; but those that come out upon other days signify that the sick shall be brought low, that his disease shall be very tedious, and that he shall be subject to relapses." He further says, "That the fever which leaves the sick upon any but an odd day is usually apt to relapse." Sometimes, however, he confesses that it is otherwise; and he gives an instance of a salutary crisis happening on the sixth day. But these are very rare instances, and there-

fore cannot overthrow the general rule.

Besides the crisis, however, or the change which determines the fate of the patient, Hippocrates often speaks of another which only changes the species of the distemper, without restoring the patient to health; as when a pleurisy turns to an inflammation of the lungs, a vertigo to an epilepsy, a tertian fever to a quartan, or to a continual, &c.

But what hath chiefly contributed to procure the <sup>25</sup>His remarkable accuracy in making observations. vast respect generally paid to Hippocrates, is his industry in observing the most minute circumstances of diseases, and his exactness in nicely describing every thing that happened before, and every accident that appeared at the same time with them; as also what appeared to give ease, and what to increase the malady, which is what we call *writing the history of a disease*.—Thus he not only distinguished one disease from another by the signs which properly belonged to each; but by comparing the same sort of distemper which happened to several persons, and the accidents which usually appeared before and after, he could easily foretell a disease before it came, and afterwards give a right judgment of the event of it. In one place, he insinuates, that he is the greatest physician who can put this in practice, or who can tell the patient what shall happen to him in the course of the distemper; which is what we call *giving the prognosics of a disease*. By this way of prognosticating, he came to be exceedingly admired: and this he carried to such a height, that it may justly be said to be his masterpiece; and Celsus, who lived after him, remarks, that succeeding physicians, though they found out several new things relating to the management of diseases, yet were obliged to the writings of Hippocrates for all that they knew of signs."

The first thing Hippocrates considered when called <sup>26</sup>His method of prognosticating from the patient's looks. to a patient, was his looks.—It was a good sign with him to have a visage resembling that of a person in health, and the same with what the sick man had before he was attacked by the disease. As it varied from this, so much the greater danger was apprehended. The following is the description which he gives of the looks of a dying man.—"When a patient (says he) has his nose sharp, his eyes sunk, his temples hollow, his ears cold and contracted, the skin of his forehead tense and dry, and the colour of his face tending to a pale-green, or lead colour, one may give out for certain that death is very near at hand; unless the strength of the patient has been exhausted all at once by long watchings, or by a looseness, or being a long time without eating." This observation has been confirmed by those of succeeding physicians, who have, from him, denominated it the *Hippocratic face*. The lips hanging relaxed and cold, are likewise looked upon by this author as a confirmation of the foregoing prognostic. He took also his signs from the disposition of the eyes in particular. When a patient cannot bear the light; when he sheds tears involuntarily; when, in sleeping, some part of the white of the eye is seen; unless he usually sleeps after that manner, or has a looseness upon him: these signs, as well as the foregoing ones, prognosticate ill. The eyes deadened (as it were with a mist spread over them, or their brightness lost,) likewise preface death, or is a sign of great weakness. The eyes sparkling, fierce,

fierce, and fixed, denote the patient to be delirious, or that he is, or soon will be, seized with a frenzy. When the patient feels any thing red, and like sparks of fire and lightning pass before his eyes, you may expect an hæmorrhage; and this often happens before those crises which are to be attended by a loss of blood.

The condition of the patient is also shewn by his posture in bed. If you find him lying on one side, his body, neck, legs, and arms, a little contracted, which is the posture of a man in health, it is a good sign: on the contrary, if he lies on his back, his arms stretched out, and his legs hanging down, it is a sign of great weakness; and particularly when the patient slides or lets himself fall down towards the feet, it denotes the approach of death. When a patient in a burning fever is continually feeling about with his hands and fingers, and moves them up before his face and eyes as if he was going to take away something that passed before them; or on his bed-covering, as if he was picking or searching for little straws, or taking away some filth, or drawing out little flocks of wool; all this is a sign that he is delirious, and that he will die. Amongst the other signs of a present or approaching delirium, he also adds this: When a patient that naturally speaks little begins to talk more than he used to do, or when one that talks much becomes silent, this change is to be reckoned a sort of delirium, or is a sign that the patient will soon fall into one. The frequent trembling or leaping up of the tendons of the wrist, preface likewise a delirium. As to the different sorts of delirium, Hippocrates is much more afraid of those that run upon doleful subjects, than such as are accompanied with mirth.

When a patient breathes fast, and is oppressed, it is a sign that he is in pain, and that the parts above the diaphragm are inflamed. Breathing long, or when the patient is a great while in taking his breath, shews him to be delirious; but easy and natural respiration is always a good sign in acute diseases. Hippocrates depended much on respiration in making his prognostics; and therefore has taken care in several places to describe the different manner of a patient's breathing. Continual watchings in acute diseases, are signs of present pain, or a delirium near at hand.

Hippocrates also drew signs from all excrements, whatever they are, that are separated from the body of man. His most remarkable ones, however, were from the urine. The patient's urine, in his opinion, is best when the sediment is white, soft to the touch, and of an equal consistence. If it continues so during the course of the distemper, and till the time of the crisis, the patient is in no danger, and will soon be well. This is what Hippocrates called *concocted urine*, or what denotes the concoction of the humours; and he observed, that this concoction of the urine seldom appeared thoroughly, but on the days of the crisis which happily put an end to the distemper. "We ought (said Hippocrates) to compare the urine with the purulent matter which runs from ulcers. As the pus, which is white, and of the same quality with the sediment of the urine we are now speaking of, is a sign that the ulcer is on the point of closing; whereas that which is clear, and of another colour besides

white, and of an ill smell, is a sign that the ulcer is virulent, and by consequence difficult to be cured: so the urines that are like this we have described are only those which may be named good; all the rest are ill, and differ from one another only in the degrees of more and less. The first never appear but when nature has overcome the disease; and are a sign of the concoction of humours, without which you cannot hope for a certain cure. On the contrary, the last are made as long as the crudity remains, and the humours continue unconcocted. Amongst the urines of this last sort the best are reddish, with a sediment that is soft, and of an equal consistence; which denotes, that the disease will be somewhat tedious, but without danger. The worst are those which are very red, and at the same time clear and without sediment; or that are muddy and troubled in the making. In urine there is often a sort of cloud hanging in the vessel in which it is received; the higher this rises, or the farther distant it is from the bottom, or the more different from the colour of the laudable sediment abovementioned, the more there is of crudity. That which is yellow, or of a sandy colour, denotes abundance of bile; that which is black is the worst, especially if it has an ill smell, and is either altogether muddy or altogether clear. That whose sediment is like large ground wheat, or little flakes or scales spread one upon another, or bran, prefaces ill, especially the last. The fat or oil that sometimes swims upon the top of the urine, and appears in a form something like a spider's web, is a sign of a consumption of the flesh and solid parts. The making of a great quantity of urine is the sign of a crisis, and sometimes the quality of it shews how the bladder is affected. We must also observe, that Hippocrates compared the state of the tongue with the urine; that is to say, when the tongue was yellow, and charged with choler, the urine he knew must of course be of the same colour; and accordingly, when the tongue was red and moist, the urine was of its natural colour.

His prognostics from the excretions by stool are as follow. Those that are soft, yellowish, of some consistence, and not of an extraordinary ill smell, that answer to the quantity of what is taken inwardly, and that are voided at the usual hours, are the best of all. They ought also to be of a thicker consistence when the distemper is near the crisis; and it ought to be taken for a good prognostic, when some worms, round and long, are evacuated at the same time with them. The prognosis, however, may still be favourable, though the matter excreted be thin and liquid, provided it make not too much noise in coming out, and the evacuation be not in a small quantity nor too often; nor in too great abundance, nor so often, as to make the patient faint. All matter that is watery, white, of a pale green, or red, or frothy and viscous, is bad. That which is black like grease, or livid like the colour of verdigrise, is the most pernicious. That which is pure black, and nothing else but a discharge of *choler adust*, or black bile, always prognosticates very ill; this humour, from what part soever it comes, never appearing, but it shews at the same time the ill disposition of the intestines. The matter that is of several different colours, denotes the length of the distemper; and, at the same time, that it may be of dangerous consequence.



Hippocrates places in the same class the matter that is bilious or yellow, and mixed with blood, or green and black, or like the dregs or scrapings of the guts. The stools that consist of pure bile, or entirely of phlegm, he also looked upon to be very bad.

31  
From the  
matter  
thrown up  
by vomit.

Matter cast up by vomiting ought to be mixed with choler and phlegm; where one of these humours only is observed, it is worse. That which is black, livid, green, or of the colour of a leek, is of dismal consequence. The same is to be said of that which smells very ill; and if at the same time it is livid, death is not far off. The vomiting of blood is very often mortal.

32  
From dif-  
ferent kinds  
of spittings.

The spittings that give ease in diseases of the lungs and in pleuritis, are those that come up readily and without difficulty; and it is good if they are mixed at the beginning with much yellow: but if they appear of the same colour, or are red, a great while after the beginning of the distemper, are salt and acrimonious, and cause violent coughings, they are not good. Spittings purely yellow are bad; and those that are white, viscous, and frothy, give no ease. Whiteness is a tolerable good sign of concoction in regard to spittings; but they ought not at all to be viscous, nor too thick, nor too clear. We may make the same judgment of the excrements of the nose according to their concoction and crudity. Spittings that are black, green, and red, are of very bad consequence. In inflammations of the lungs, those that are mixed with choler and blood presage well if they appear at the beginning, but are bad if they arise not about the seventh day. But the worst sign in these distempers is, when there is no expectoration at all, and the too great quantity of matter that is ready to be discharged this way makes a rattling in the breast. After spitting of blood next follows the discharge of purulent matter, which brings on a consumption, and at last death.

33  
From the  
sweat.

A kind good sweat is that which arises on the day of the crisis, and is discharged in abundance all over the body, and at the same time from all parts of the body, and thus carries off the fever: A cold sweat is bad, especially in acute fevers, for in others it is only a sign of long continuance. When the patient sweats nowhere but in the head and neck, it is a sign that the disease will be long and dangerous. A gentle sweat in some particular part, of the head and breast, for instance, gives no relief, but denotes the seat of the distemper, or the weakness of the part. This kind of sweat was called by Hippocrates *epididrosis*.

34  
From the  
state of the  
hypocondria.

The hypocondria, or the abdomen in general, ought always to be soft and even as well on the right side as on the left. When there is any hardness or unevenness in those parts, or heat and swellings, or when the patient cannot endure to have it touched, it is a sign the intestines are indispended.

35  
He under-  
stood some-  
thing of the  
pulse.

Hippocrates also inquired into the state of the pulse, or the beating of the arteries. According to Galen, he was the first physician that made use of the word *pulse* in the sense in which it is now commonly taken; that is to say, for the natural and ordinary beating of the arteries. For the most ancient physicians, and even Hippocrates himself, for a long time, by this word understood the violent pulsation that is felt in an inflamed part, without putting the fingers to it. It is

observed, however, by Galen, and other physicians, that Hippocrates touches on the subject of the pulse more slightly than any other on which he treats. But that our celebrated physician understood something even on this subject, is easily gathered from several passages in his writings; as when he observes, that in acute fevers the pulse is very quick and very great; and when he makes mention, in the same place, of trembling pulses, and those that beat slowly; when he observes, that in some diseases incident to women, when the pulse strikes the finger faintly, and in a languishing manner, it is a sign of approaching death. He remarks also, in the *Cocæ Prænotiones*, that he whose vein, that is to say, whose artery of the elbow beats, is just going to run mad, or else that the person is at that time in a very great passion of anger.

From this account of Hippocrates, it will appear, that he was not near so much taken up with reasoning on the phenomena of diseases, as of reporting them. He was content to observe these phenomena exactly, to distinguish diseases by them, and judged of the event by comparing them exactly together. For his skill in prognostics he was indeed very remarkable, as we have already mentioned, inasmuch that he and his pupils were looked upon by the vulgar as prophets. What adds very much to his reputation is, that he lived in an age when physic was altogether buried in superstition, and yet he did not suffer himself to be carried away by it; on the contrary, on many occasions, he expresses his abhorrence of it.

Having thus seen in what Hippocrates makes the difference between health and sickness to consist, and likewise the most remarkable signs from whence he drew his prognostics, we must now consider the means he prescribed for the preservation of health, and the cure of diseases. One of his principal maxims was this, That, to preserve health, we ought not to overcharge ourselves with too much eating, nor neglect the use of exercise and labour. In the next place, That we ought by no means to accustom ourselves to too nice and exact a method of living; because those that have once begun to act by this rule, if they vary in the least from it, find themselves very ill; which does not happen to those who take a little more liberty, and live somewhat more irregularly. Notwithstanding this, he does not neglect to inquire diligently into what those who were in health used for food in his time.

Here we cannot help taking notice of the prodigious disparity between the delicacy of the people in our days, and in those of Hippocrates: for he takes great pains to tell the difference between the flesh of a dog, a fox, a horse, and an ass; which he would not have done if at that time they had not been used for victuals, at least by the common people. Besides these, however, Hippocrates speaks of all other kinds of provisions that are now in use; for example, salads, milk, whey, cheese, flesh as well of birds as of four-footed beasts, fresh and salt fish, eggs, all kinds of pulse, and the different kinds of grain we feed on, as well as the different sorts of bread that are made of it. He also speaks very often of a sort of liquid food, or broth, made of barley-meal, or some other grain, which they steeped for some time, and then boiled in water. With regard to drink, he takes a great deal of pains to distinguish the good waters from the bad.

The

36  
Was but  
little taken  
up with rea-  
soning.

37  
His meth-  
ods for the  
preservation  
of health.

39  
Flesh of  
our dogs, foxes,  
asses, &c.  
anciently  
used for  
food.

The best, in his opinion, ought to be clear, light, without smell or taste, and taken out of the fountains that turn towards the east. The salt-waters, those that he calls hard, and those that rise out of fenny ground, are the worst of all; as also those that come from melted snow. But though Hippocrates makes all these distinctions, he advises those who are in health to drink of the first water that comes in their way. He speaks also of alum waters, and those that are hot; but does not enlarge upon their qualities. He advises to mix wine with an equal quantity of water: and this, he says, is the just proportion; by using which the wine will expel what is hurtful to the body, and the water will serve to temper the acrimony of the humours.

For those that are in health, and likewise for such as are sick, Hippocrates advises exercise. The books, however, which treat on this subject, M. Le Clerc conjectures to have been written by Herodicus, who first introduced gymnastic exercise into medicine, and who is said by Hippocrates himself to have killed several people by forcing them to walk while they were afflicted with fevers and other inflammatory disorders. The advice given in them consist mostly in directions for the times in which we ought to walk, and the condition we ought to be in before it; when we ought to walk slowly, and when to run, &c.; and all this with respect to different ages and temperaments, and with design to bring the body down, or dissipate the humours. Wrestling, although a violent exercise, is numbered with the rest. In the same place also, mention is made of a play of the hands and fingers, which was thought good for health, and called *chironomie*; and of another diversion which was performed round a sort of ball hung up, which they called *coryceus*, and which they thruck forward with both their hands.

With regard to those things which ought to be separated from, or retained in the human body, Hippocrates observes, that people ought to take great care not to load themselves with excrements, or keep them in too long; and besides the exercise abovementioned, which carries off one part of them, and which he prescribed chiefly on this account, he advises people to excite and rouse up nature when she is flugged, and did not endeavour to expel the rest, or take care of the impediments by which she was resisted. For this reason he prescribed meats proper for loosening the belly; and when these were not sufficient, he directed the use of clysters and suppositories. For thin and emaciated persons he directed clysters composed only of milk and oily unctuous substances, which they mixed with a decoction of chick-pease; but for such as were plethoric, they only made use of salt, or sea-water.

As a preservative against distempers, Hippocrates also advised the use of vomits, which he directed to be taken once or twice a month during the time of winter and spring. The most simple of these were made of a decoction of hyssop, with an addition of a little vinegar and salt. He made those that were of a strong and vigorous constitution take this liquor in a morning fasting; but such as were thin and weakly took it after supper.—Venus, in his opinion, is wholesome, provided people consult their strength, and do not pursue it to excess; which he finds fault with on all occasions, and would have it avoided also in relation to

sleep and watching. In his writings are likewise to be found several remarks concerning good and bad air; and he makes it appear that the good or bad disposition of this element does not depend solely on the difference of the climate, but on the situation of every place in particular. He speaks also of the good and bad effects of the passions, and would have us use a great deal of moderation in regard to them.

From what we have already related concerning the opinions of Hippocrates, it may naturally be concluded, that for the most part he would be contented with observing what the strength of nature is able to accomplish without being assisted by the physician. That this was really the case, may be easily perceived from a perusal of his books entitled, “Of epidemically contented distempers;” which are, as it were, journals of the practice of Hippocrates: for there we find him often doing nothing more than describing the symptoms of a distemper, and informing us what has happened to the patient day after day, even to his death or recovery, without speaking a word of any kind of remedy. Sometimes, however, he did indeed make use of remedies; but these were exceedingly simple and few, in comparison of what have been given by succeeding practitioners. These remedies we shall presently consider, after we have given an abridgement of the principal maxims on which his practice is founded.

Hippocrates asserted in the first place, That contraries, or opposites, are the remedies for each other; and this maxim he explains by an aphorism, where he says, that evacuations cure those distempers which come from repletion, and repletion those that are caused by evacuation. So heat is destroyed by cold, and cold by heat, &c. In the second place, he asserted that physic is an addition of what is wanting, and a subtraction or retrenchment of what is superfluous: an axiom which is explained by this, viz. that there are some juices or humours, which in particular cases ought to be evacuated, or driven out of the body, or dried up; and some others which ought to be restored to the body, or caused to be produced there again. As to the method to be taken for this addition or retrenchment, he gives this general caution, That you ought to be careful how you fill up, or evacuate, all at once, or too quickly, or too much; and that it is equally dangerous to heat or cool again on a sudden: or rather, you ought not to do it; every thing that runs to an excess being an enemy to nature. In the fourth place, Hippocrates allowed that we ought sometimes to dilate, and sometimes to lock up: to dilate, or open the passages by which the humours are voided naturally, when they are not sufficiently opened, or when they are closed; and, on the contrary, to lock up or straiten the passages that are relaxed, when the juices that pass there ought not to pass, or when they pass in too great quantity. He adds, that we ought sometimes to smooth, and sometimes to make rough; sometimes to harden, and sometimes to soften again; sometimes to make more fine or supple; sometimes to thicken; sometimes to rouse up, and at other times to stupify or take away the sense; all in relation to the solid parts of the body, or to the humours. He gives also this fifth lesson, That we ought to have regard to the course the humours take, from whence they come, and whither they go; and in consequence of that, when they

they go where they ought not, that we make them take a turn about, or carry them another way, almost like the turning the course of a river: or, upon other occasions, that we endeavour if possible to recal, or make the same humours return back again; drawing upward such as have a tendency downward, and drawing downward such as tend upward. We ought also to carry off, by convenient ways, that which is necessary to be carried off; and not let the humours once evacuated, enter into the vessels again. Hippocrates gives also the following instruction. That when we do any thing according to reason, though the success be not answerable, we ought not too easily, or too hastily, to alter the manner of acting, as long as the reasons for it are yet good. But as this maxim might sometimes prove deceitful, he gives the following as a corrector to it: "We ought (says he) to mind with a great deal of attention what gives ease, and what creates pain; what is easily supported, and what cannot be endured." We ought not to do any thing rashly; but ought to pause, or wait, without doing any thing: by this way, if you do the patient no good, you will at least do him no hurt. In extreme illness we ought to use medicines of the same nature: That which medicines cure not, the sword does; what the sword does not, the fire does; but what the fire cannot cure ought to be looked upon as incurable: And lastly, we ought not to undertake the cure of desperate diseases which are beyond the power of physic.

These are the principal and most general maxims of the practice of Hippocrates, and which proceed upon the supposition laid down at the beginning, viz. that nature cures diseases. We next proceed to consider particularly the remedies employed by him, which will serve to give us further instructions concerning his practice.

Diet was the first, the principal, and oftentimes the only remedy made use of by this great physician to answer the greatest part of the intentions above-mentioned: by means of it he opposed moist to dry, hot to cold, &c.; and what he looked upon to be the most considerable point was, that thus he supported nature, and assisted her to overcome the malady. The dietetic part of medicine was so much the invention of Hippocrates himself, that he was very desirous to be accounted the author of it; and the better to make it appear that it was a new remedy in his days, he says expressly, that the ancients had wrote almost nothing concerning the diet of the sick, having omitted this point, though it was one of the most essential parts of the art. That he spoke the truth in this respect is plain from what we have already observed concerning the treatment of the wounded heroes by the pupils of *Æsculapius*.

The diet prescribed by Hippocrates for patients labouring under acute distempers, differed from that which he ordered for those afflicted with chronic ones. In the former, which require a more particular exactness in relation to diet, he preferred liquid food to that which was solid, especially in fevers. For these he used a sort of broths made of cleansed barley; and to these he gave the name of *ptisan*, which was common as well to these broths as to the flower of the grain of which they were made. The manner in which the ancients prepared a *ptisan* was as follows. They

first steeped the barley in water till it was plumped up; and afterwards they dried it in the sun, and beat it to take off the hulk. They next ground it; and having let the flower boil a long time in the water, they put it out into the sun, and when it was dry they pressed it close. It is properly this flower so prepared that is called *ptisan*. They did almost the same thing with wheat, rice, lentils, and other grain: but they gave these *ptisanes* the name of the grain from whence they were extracted, as *ptisan of lentils, rice, &c.*; whereas the *ptisan* of barley was called simply *ptisan*, on account of the excellency of it. When they had a mind to use it, they boiled one part of it in 10 or 15 of water; and when it began to grow plump in boiling, they added a drop of vinegar, and a very small quantity of anise or leek, to keep it from clogging, or filling the stomach with wind. Hippocrates prescribes this broth for women that have pains in their belly after being brought to bed. "Boil some of this *ptisan*, (says he), with some leek, and the fat of a goat, and give it to the woman in bed." This will not be thought very odd, if we reflect on what has been hinted above, concerning the indelicate manner of living in those times. He preferred the *ptisan* to all other food in fevers, because it softened and moistened much, and was besides of easy digestion. If he was concerned in a continual fever, he would have the patient begin with a *ptisan* of a pretty thick consistence, and go on by little and little, lessening the quantity of barley-flower as the height of the distemper approached; so that he did not feed the patient but with what he called the *juice of the ptisan*; that is, the *ptisan* strained, where there was but very little of the flower remaining, in order that nature being discharged in part from the care of digesting the aliments, she might the more easily hold out to the end, and overcome the distemper, or the cause of it. With regard to the quantity, he caused the *ptisan* to be taken twice a day by such patients as in health used to take two meals a-day, not thinking it convenient that those who were sick should eat oftener than when they were well. He also would not allow eating twice a day to those who eat but once in that time when in health. In the paroxysm of a fever he gave nothing at all; and in all distempers where there are exacerbations, he forbid nourishment while the exacerbations continued. He let children eat more; but those who were grown up to man's estate, or were of an advanced age, less; making allowance, however, for the custom of each particular person, or for that of the country.

But though he was of opinion that too much food ought not to be allowed to the sick, he was not of the mind of some physicians who prescribed long abstinence, especially in the beginning of fevers. The reason he gave for this was, that the contrary practice weakened the patients too much during the first days of the distemper, by which means their physicians were obliged to allow them more food when the illness was at its height, which in his opinion was improper. He complained that "they dried up their patients like herrings, before there was any occasion for it, and destroyed them for want of nourishment." Besides, in acute distempers, and particularly in fevers, Hippocrates made choice of refreshing and moistening nourishment; and amongst other things prescribed orange,  
melon,

41  
Diet his  
principal  
remedy.

42  
Diets for  
patients in  
acute dis-  
tempers.

43  
Did not ap-  
prove of  
long absti-  
nence.



44  
The drink  
prescribed  
by him.

melon, spinach, gourd, and dock. This sort of food he gave to those that were in a condition to eat, or could take something more than a pisan.

The drink he commonly gave to his patients was made of eight parts of water, and one of honey. In some distempers they added a little vinegar; but besides these, they had another sort named *auxury*, or *mixture*. One prescription of this sort we find intended for a consumptive person; it consisted of rue, anise, celery, coriander, juice of pomegranate, the roughest red wine, water, flour of wheat and barley, with old cheese made of goats milk. Hippocrates did not approve of giving plain water to the sick; but though he generally prescribed the drinks above-mentioned, he did not absolutely forbid the use of wine, even in acute distempers and fevers, provided the patients were not delirious nor had pains in their head. The quantity of water he would have them put into it in health, made him judge that it would not be hurtful to such as were sick if taken after the same manner. Besides, he took care to distinguish the wines proper in these cases: preferring to all other sorts, white-wine that is clear and has a great deal of water, with neither sweetness nor flavour.

These are the most remarkable particulars concerning the diet prescribed by Hippocrates in acute distempers: in chronic ones he made very much use of milk and whey; though we are not certain whether this was done on account of the nourishment expected from them, or that he accounted them medicines.

45  
Directions  
concerning  
Bathing.

There were many diseases for which he judged the bath was a proper remedy; and he takes notice of all the circumstances that are necessary in order to cause the patient receive benefit from it, among which the following are the principal. The patient that bathes himself must remain still and quiet in his place without speaking, while the assistants throw water over his head or are wiping him dry; for which last purpose he desired them to keep sponges, instead of that instrument called by the ancients *strigil*, which served to rub off from the skin the dirt and nastiness left upon it by the unguents and oils with which they anointed themselves. He must also take care not to catch cold; and must not bathe immediately after eating and drinking, nor eat or drink immediately after coming out of the bath. regard must also be had whether the patient has been accustomed to bathe while in health, and whether he has been benefited or hurt by it. Lastly, he must abstain from the bath when the body is too open, or too collicive, or when he is too weak; or if he has an inclination to vomit, a great loss of appetite, or bleeds at the nose. The advantage of the bath, according to Hippocrates, consists in moistening and refreshing, taking away weariness, making the skin soft and the joints pliant; in provoking urine, making the nostrils open, and opening the other excretories. He allows two baths in a-day to those who have been accustomed to it in their health.

46  
Approves  
of exercise  
in chronic  
distempers

In chronic distempers Hippocrates approved very much of exercise, though he did not allow it in acute ones; but even in these he did not think that a patient ought always to lie a-bed; but tells us, that "we must sometimes push the timorous out of bed, and rouse up the lazy."

When our physician found that diet and exercise were not sufficient to ease nature of a burden of corrupted humours, he was obliged to make use of other means, of which *purgation* was one. By this word he understood all the contrivances that are made use of to discharge the stomach and bowels; though it properly signifies only the evacuation of the belly by stool. This evacuation he imagined to be occasioned by the purgative medicines attracting the humours to themselves. When first taken into the body, he thought they attracted that humour which was most similar to them, and then the others, one after another.—The purgatives used in his time were mostly emetics also, or at least were very violent in their operation downwards. These were the white and black hellebore; the first of which is now reckoned among the poisons. He used also the Cuidian berries, which are nothing else but the seeds of thymalea or chamælea; cneorum, peplum, which is a sort of milk-thistle; thepsia, the juice of hippophae, a sort of rhamnus; elaterium, or juice of the wild cucumber; flowers of brasa, colquintida, scammony, the magnesian stone, which is a sort of limestone, &c.

49  
On what  
occasions  
he used  
them.

As these purgatives were all very strong, Hippocrates was extremely cautious in their exhibition. He did not prescribe them in the dog-days; nor did he ever purge women with child, and very seldom children or old people. He principally used purgatives in chronic distempers; but was much more wary in acute ones. In his books entitled "Of epidemical distempers," there are very few patients mentioned to whom he gave purgative medicines. He also takes notice expressly, that these medicines having been given in cases of the distempers of which he was treating, had produced very bad effects.—We are not, however, from this to conclude that Hippocrates absolutely condemned purging in acute distempers; for in some places he expressly mentions his having given them with success. He was of opinion, for instance, that purging was good in a pleurisy when the pain was seated below the diaphragm; and in this case he gave black hellebore, or some peplum mixed with the juice of *lasopitium*, which is supposed to have been our asafætida.

The principal rule Hippocrates gives with relation to purging is, that we ought only to purge off the humours that are concocted, and not those that are yet crude, taking particular care not to do it at the beginning of the distemper, lest the humours should be disturbed or stirred up, which happens pretty often. He was not, however, the first who remarked that it would be of ill consequence to stir the humours in the beginning of an acute distemper. The Egyptian physicians had before observed the same thing.—By the *beginning* of a distemper, Hippocrates understood all the time from the first day to the fourth complete.

49  
His rule  
concerning  
their use.

Notwithstanding this, however, it is certain that Hippocrates did sometimes exhibit purgatives at the beginning of acute distempers; and he has an aphorism directly contrary to the precedent one, where he says, *mer.* That in the beginning of distempers we ought to stir the humours, and to purge what we think we have stirred. This aphorism has occasioned no small trouble to physicians of succeeding ages, who have found a

50  
Gives ano-  
ther rule  
contrary to  
the fore-

great

great deal of difficulty in reconciling it with the foregoing. Galen has got off by commenting on the phrase *to stir up*. This, he says, signifies using all the remedies that are necessary for the ease of the patient; among which he reckons particularly bleeding and purging. According to him, therefore, the stirring up mentioned by Hippocrates consists chiefly in bleeding: that is to say, purgation might be admitted at the beginning of distempers sometimes, but very rarely; and in fact we find, that Hippocrates himself did purge some people at the beginning of distempers, though very seldom.

51  
Hydragogue, &c.  
medicines  
whence de-  
nominated.

Hippocrates imagined that each purgative medicine was adapted to the carrying off some particular humour; and hence the distinction of purgatives into hydragogue, cholagogue, &c. which is now justly exploded. In consequence of this notion, which prevailed long after his time, he pretended that we knew if a purgative had drawn from the body what was fit to be evacuated according as we found ourselves well or ill upon it. If we found ourselves well, it was a sign that the medicine had effectually expelled the offending humour. On the contrary, if we were ill, he imagined, whatever quantity of humour came away, that the humour which caused the illness still remained; not judging of the goodness or badness of a purge by the quantity of matters that were voided by it, but by their quality and the effect that followed after it.

52  
His prac-  
tice with  
regard to  
vomits.

Vomits were also pretty much used as medicines by Hippocrates. We have already seen what those were which he prescribed to people in health by way of preventatives. With regard to the sick, he sometimes advised them to the same, when his intentions were only to cleanse the stomach. But when he had a mind to recall the humours, as he termed it, from the inmost recesses of the body, he made use of brisker remedies. Among these was white hellebore; and this indeed he most frequently used to excite vomiting. He gave this root particularly to melancholy and mad people; and from the great use made of it in these cases by Hippocrates and other ancient physicians, the phrase *to have need of hellebore*, became a proverbial expression for being out of one's senses. He gave it also in dejections, which come, according to him, from the brain, and throw themselves on the nostrils or ears, or fill the mouth with saliva, or that cause stubborn pains in the head, and a weariness or an extraordinary heaviness, or a weakness of the knees, or a swelling all over the body. He gave it to consumptive persons in broth of lentils, to such as were afflicted with the dropsy called *leucoplegmia*, and in other chronic disorders. But we do not find that he made use of it in acute distempers, except in the cholera morbus, where he says he prescribed it with benefit. Some took this medicine fasting; but most took it after supper, as was commonly practised with regard to vomits taken by way of prevention. The reason why he gave this medicine most commonly after eating was, that by mixing with the aliments, its acrimony might be somewhat abated, and it might operate with less violence on the membranes of the stomach. With the same intention also he sometimes gave a plant called *sesamoides*, and sometimes mixed it with hellebore. Lastly, in certain cases he gave what he called *soft* or *sweet* hellebore. This term had some relation to the quality of the hel-

lebole, or perhaps to the quantity he gave of it.

When Hippocrates had a mind only to keep the body open, or evacuate the contents of the intestines, <sup>53</sup> *his* he made use of simples; as for example, the herb mercury, or cabbage; the juice or decoction of which he ordered to be drank. For the same purpose he used whey, and also cows and asses milk; adding a little salt to it, and sometimes letting it boil a little. If he gave asses milk alone, he caused a great quantity of it to be taken, so that it must of necessity loosen the body. In one place he prescribes no less than nine pounds of it to be taken as a laxative, but does not specify the time in which it was to be taken. With the same intention he made use of suppositories and clysters. The former were compounded of honey, the juice of herb mercury, of nitre, powder of colocynth, and other sharp ingredients to irritate the anus. These they formed into a ball, or into a long cylindrical mass like a finger. The clysters he made use of for sick people were sometimes the same with those already mentioned as preventatives for people in health. At other times, he mixed the decoction of herbs with nitre, honey, and oil, or other ingredients, according as he imagined he could by that means attract, wash, irritate, or soften. The quantity of liquor he ordered was about 36 ounces; from which it is probable he did not intend that it should all be used at one time.

At some times Hippocrates proposed to purge the head alone. This remedy he made use of, after purging the rest of the body, in an apoplexy, inveterate pains of the head, a certain sort of jaundice, a consumption, and the greatest part of chronic distempers. For that purpose he made use of the juices of several plants, as celery; to which he sometimes added aromatic drugs, making the patients snuff up this mixture into their nostrils. He used also powders compounded of myrrh, the flowers of brais, and white hellebore, which he caused them put up into the nose, to make them sneeze, and to draw the phlegm from the brain. For the same purpose also he used what he calls *tetragonon*, that is, "something having four angles;" but what this was, is now altogether unknown, and was so even in the days of Galen. The latter physician, however, conjectures it to be antimony, or certain flakes found in it.

In the distemper called *empyema*, (or a collection of matter in the breast,) he made use of a very rough medicine. He commanded the patient to draw in his tongue as much as he was able; and when that was done, he endeavoured to put into the hollow of the lungs a liquor that irritated the part, which, raising a violent cough, forced the lungs to discharge the purulent matter contained in them. The materials that he used for this purpose were of different sorts; sometimes he took the root of arum, which he ordered to be boiled with a grain of salt, in a sufficient quantity of water and oil, dissolving a little honey in it. At other times, when he intended to purge more strongly, he took the flowers of copper and hellebore: after that he shook the patient violently by the shoulders, the better to loosen the pus. This remedy, according to Galen, he received from the Cuidian physicians; and it has never been used by the succeeding ones, probably because the patients could not suffer it.

Blood-

56  
Blood-let-  
ting, when  
prescribed.

Blood-letting was another method of evacuation pretty much used by Hippocrates. Another aim he had in this, besides the mere evacuation, was to divert or recal the course of the blood when he imagined it was going where it ought not. A third end of bleeding was to procure a free motion of the blood and spirits, as we may gather from the following passage: "When any one becomes speechless of a sudden, (says he), it is caused by the shutting of the veins, especially when it happens to persons otherwise in good health, without any outward violence. In this case the inward vein of the right-arm must be opened, and more or less blood taken away, according to the age or constitution of the patient. Those that lose their speech thus have great flushings in their face, their eyes are stiff, their arms are distended, their teeth gnash, they have palpitations of the arteries, cannot open their jaws, the extremities are cold, and the spirits are intercepted in the veins. If pain ensues, it is by the accession of the black bile and sharp humours. For the internal parts being vellicated or irritated by these humours, suffer very much; and the veins, being also irritated and dried, distend themselves extraordinarily, and are inflamed, and draw all that can flow to them; so that the blood corrupting, and the spirits not being able to pass through the blood by their ordinary passages, the parts grow cold by reason of this stagnation of the spirits. Hence come giddiness, loss of speech, and convulsions, if this disorder reaches to the heart, the liver, or to the great veins. From hence come also epilepsies and palsies, if the distensions fall upon the parts last mentioned; and that they dry up, because the spirits are denied a passage through them. In this case, after fomentation, a vein must be opened, while the spirits and humours are yet suspended and unsettled."

Hippocrates had also a fourth intention for bleeding, and this was refreshment. So in the iliac passion, he orders bleeding in the arm and in the head; to the end, says he, that the superior venter, or the breast, may cease to be overheated. With regard to this evacuation, his conduct was much the same as to purging, in respect of time and persons. We ought, says he, to let blood in acute diseases, when they are violent, if the party be lusty and in the flower of his age. We ought also to have regard to the time, both in respect to the disease and to the season in which we let blood. He also informs us, that blood ought to be let in great pains, and particularly in inflammations. Among these he reckons such as fall upon the principal viscera, as the liver, lungs, and spleen, as also the quinsy and pleurisy, if the pain of the latter be above the diaphragm. In these cases he would have the patients bled till they faint, especially if the pain is very acute; or rather he advises that the orifice should not be closed till the colour of the blood alters, so that from livid it turn red, or from red, livid. In a quinsy he bled in both arms at once. Difficulty of breathing he also reckons among the distempers that require bleeding; and he mentions another sort of inflammation of the lungs, which he calls a swelling, or tumours of the lungs arising from heat; in which case he advises to bleed in all parts of the body; and directs particularly to the arms, tongue, and nostrils. To make bleeding the more useful in all pains, he directed to

open the vein nearest the part affected; in a pleurisy he directs to take blood from the arm of the side affected; and for the same reason, in pains of the head, he directs the veins of the nose and forehead to be opened. These directions, however, we now know to be almost entirely superfluous, and to have proceeded from Hippocrates's ignorance of the blood's circulation. When the pain was not urgent, and bleeding was advised by way of prevention, he directed the blood to be taken from the parts farthest off, with a design to divert the blood insensibly from the seat of pain. The highest burning fevers which shew neither signs of inflammation nor pain, he does not rank among those distempers that require bleeding. On the contrary, he maintains that a fever itself is in some cases a reason against bleeding. If any one, says he, has an ulcer in the head, he must bleed, *unless he has a fever*. He says further, those that lose their speech of a sudden must be bled, unless they have a fever. Perhaps he was afraid of bleeding in fevers because he supposes that they were produced by the bile and pituita, which grew hot, and afterwards heated the whole body, which is, says he, what we call *fever*, and which, in his opinion, cannot well be evacuated by bleeding. In other places also he looks upon the presence or abundance of bile to be an objection to bleeding; and he orders to forbear venesection even in a pleurisy, if there is bile. To this we must add, that Hippocrates distinguished very particularly between a fever which followed no other distemper, but was itself the original malady, and a fever which came upon inflammation. In the early ages of physic, the first were only properly called *fevers*: the others took their names from the parts affected; as *pleurisy*, *peripneumony*, *hepatitis*, *nephritis*, &c. which names signify that the pleura, the lungs, the liver, or the kidneys, are diseased, but do not intimate the fever which accompanies the disease. In this latter sort of fever Hippocrates constantly ordered bleeding, but not in the former. Hence, in his books Of Epidemic Distempers, we find but few directions for bleeding in the acute distempers, and particularly in the great number of continual and burning fevers there treated of. In the first and third book we find but one single instance of bleeding, and that in a pleurisy; in which, too, he staid till the eighth day of the distemper. Galen, however, and most other commentators on Hippocrates, are of opinion that the latter did generally blood his patients plentifully in the beginning of acute disorders, though he takes no notice of it in his writings. But had this been the case, he would not perhaps have had the opportunity of seeing so many fevers terminate by crises, or natural evacuations, which happen of themselves on certain days. Hippocrates, in fact, laid so much weight upon the assistance of nature and the method of diet, which was his favourite medicine, that he thought if they took care to diet the patients before-mentioned, according to rule, they might leave the rest to nature. These are his true principles, from which he never deviates; so that his pieces Of Epidemical Diseases seem to have been composed only with an intention to leave to posterity an exact model of management in pursuance of these principles.

With regard to the rules laid down by Hippocrates for bleeding, we must further take notice, that in all



diseases which had their seat above the liver, he bled in the arm, or in some of the upper parts of the body; but for those that were situated below it, he opened the veins of the foot, ankle, or ham. If the belly was too laxative, and bleeding was thought necessary, he ordered the looseness to be stopped before bleeding.

Almost all these instances, however, regard scarce any thing but acute distempers; but we find several concerning chronic diseases. "A young man complained of great pain in his belly, with a rumbling while he was fasting, which ceased after eating: this pain and rumbling continuing, his meat did him no good; but, on the contrary, he daily wasted and grew lean. Several medicines, as well purges as vomits, were given him in vain. At length it was resolved to bleed him, by intervals, first in one arm and then in the other, till he had scarce any blood left, and by this method he was perfectly cured."

Hippocrates let blood also in a dropy, even in a tympany; and in both cases he prescribes bleeding in the arm. In a disease occasioned by an overgrown spleen, he proposes bleeding several times repeated at a vein of the arm which he calls the *splenic*; and in a kind of jaundice, he proposes bleeding under the tongue. On some occasions he took away great quantities of blood, as appears from what we have already observed. Sometimes he continued the bleeding till the patient fainted: at other times he would blood in both arms at once; at others, he did it in several places of the body, and at several times. The veins he opened were those of the arm, the hands, the ankles on both sides, the hams, the forehead, behind the head, the tongue, the nose, behind the ears, under the breasts, and those of the arms; besides which, he burnt others, and opened several arteries. He likewise used cupping-vessels, with intent to recall or withdraw the humours which fell upon any part. Sometimes he contented himself with the bare attraction made by the cupping vessels, but sometimes also he made scarifications.

<sup>57</sup> When bleeding and purging, which were the principal and most general means used by Hippocrates for taking off a plethora, proved insufficient for that purpose, he had recourse to diuretics and sudorifics. The former were of different sorts, according to the constitution of the persons: sometimes baths, and sometimes sweet wine, provoke urine; sometimes the nourishment which we take contributes to it: and amongst those herbs which are commonly eaten, Hippocrates recommends garlic, leeks, onions, cucumbers, melons, gourds, fennel, and all other things which have a biting taste and a strong smell. With these he numbers honey, mixed with water or vinegar, and all salt meats. But, on some occasions, he took four cantharides, and, pulling off their wings and feet, gave them in wine and honey. These remedies were given in a great number of chronic distempers after purging, when he thought the blood was overcharged with a sort of moisture which he calls *ichor*; or in suppressions of urine, and when it was made in less quantity than it ought. There were also some cases in which he would force sweat as well as urine; but he neither mentions the diseases in which sudorifics are proper, nor lets us know what medicines are to

be used for this purpose, except in one single passage, where he mentions sweating, by pouring upon the head a great quantity of water till the feet sweat; that is, till the sweat diffuses itself over the whole body, running from head to foot. After this he would have them eat boiled meat, and drink thereupon pure wine, and, being well covered with clothes, lay themselves down to rest. The disease for which he proposes the above-mentioned remedy is a fever; which is not, according to him, produced by bile or pituita, but by mere lassitude, or some other like cause; from whence we may conclude that he did not approve of sweating in any other kind of fever.

Other remedies which Hippocrates tells us he made <sup>58</sup> use of were those that purged neither bile nor phlegm, but act by cooling, drying, heating, moistening, or by <sup>He sometimes used</sup> hypnotics, <sup>by hypnotics,</sup> closing and thickening, resolving and dissipating. These medicines, however, he does not particularly mention; and it is probable they were only some particular kinds of food. To these he joined *hypnotics*, or such things as procure sleep; but these last were used very seldom, and, it is most probable, were only different preparations of poppies.

Lastly, besides the medicines already mentioned, <sup>59</sup> And <sup>speci-</sup> which acted in a sensible manner, Hippocrates made <sup>fics.</sup> use of others called *specifics*; whose action he did not understand, and for the use of which he could give no reason besides his own experience, or that of other physicians. These he had learned from his predecessors the descendants of *Æsculapius*, who, being *empirics*, did not trouble themselves about inquiring into the operation of their remedies, provided their patients were cured.

Of the external remedies prescribed by Hippocrates, fomentations were the chief. These were of <sup>60</sup> His external applica- <sup>tions.</sup> two kinds. The one was a sort of bath, in which the patient sat in a vessel full of a decoction of simples appropriated to his malady; so that the part affected was soaked in the decoction. This was chiefly used in distempers of the womb, of the arms, the bladder, the reins, and generally all the parts below the diaphragm. The second way of fomenting was, to take warm water and put it into a skin or bladder, or even into a copper or earthen vessel, and to apply it to the part affected; as, for example, in a pleurisy. They used likewise a large sponge, which they dipped in the water, or other hot liquor, and squeezed out part of the liquor before they applied it. The same use they made of barley, vetches, or bran, which were boiled in some proper liquor, and applied in a linen bag. These are called *moist fomentations*. The dry ones were made of salt or millet, heated considerably, and applied to the part. Another kind of fomentation was the vapour of some hot liquor; an instance of which we find in his first book of *Womens distempers*. He cast, at several times, bits of red-hot iron into urine, and, covering up the patient close, caused her to receive the steam below. His design in these kinds of fomentations was to warm the part, to resolve or dissipate, and draw out the peccant matter, to mollify and assuage pain, to open the passages, or even to shut them, according as the fomentations were emollient or astringent.

Fumigations were likewise very often used by Hippocrates. In the quinsey, he burned hyssop with sulphur

sulphur and pitch, and caused the smoke to be drawn into the throat by a funnel; and by this means he brought away abundance of phlegm through the mouth, and through the nose. For this purpose he took nitre, marjoram, and cress-seeds, which he boiled in water, vinegar, and oil, and, while it was on the fire, caused the patient to draw in the steam by a pipe. In his works we find a great number of fumigants for the distempers of women, to promote the menstrual flux, to check it, to help conception, and to ease pains in the matrix, or the suffocation of it. On these occasions he used such aromatics as were then known, viz. cinnamon, cassia, myrrh, and several odoriferous plants; as likewise some minerals, such as nitre, sulphur, and pitch, and caused them to receive the vapours through a funnel into the uterus.

Gargles, a kind of fomentations for the mouth, were also known to Hippocrates. In the quinsy he used a gargle made of marjoram, savory, celery, mint, and nitre, boiled with water and a little vinegar. When this was strained, they added honey to it, and washed their mouths frequently with it.

Oils and ointments were likewise much used by Hippocrates, with a view to mollify and abate pain, to ripen boils, resolve tumours, refresh after weariness, make the body supple, &c. For this purpose, sometimes pure oil of olives was used; sometimes certain simples were infused in it, as the leaves of myrtle and roses; and the latter kind of oil was in much request among the ancients. There were other sorts of oils sometimes in use, however, which were much more compounded. Hippocrates speaks of one called *susinum*, which was made of the flowers of the iris, of some aromatics, of an ointment of narcissus made with the flowers of narcissus and aromatics infused in oil. But the most compounded of all his ointments was that called *netopum*, which he made particularly for women; and consisted, according to Hefychius, of a great number of ingredients. Another ointment, to which he gave the name of *ceratum*, was composed of oil and wax. An ointment which he recommends for the softening of a tumour, and the cleansing of a wound, was made by the following receipt: "Take the quantity of a nut of the marrow or fat of a sheep, of mastic or turpentine the quantity of a bean, and as much wax; melt these over a fire, with oil of roses, for a *ceratum*." Sometimes he added pitch and wax, and, with a sufficient quantity of oil, made a composition somewhat more consistent than the former, which he called *cerapifus*.

*Cataplasms* were a sort of remedies less consistent than the two former. They were made of powders or herbs steeped or boiled in water or some other liquor, to which sometimes they added oil. They were used with a view to soften or resolve tumours, ripen abscesses, &c. though they had also cooling cataplasms made of the leaves of beets or oak, fig or olive-trees, boiled in water.

Lastly, to complete the catalogue of the external remedies used by Hippocrates, we shall mention a sort of medicine called *collyrium*. It was compounded of powders, to which was added a small quantity of some ointment, or juice of a plant, to make a solid or dry mals; the form of which was long and round, which was kept for use. Another composition of

much the same nature was a sort of lozenge of the bigness of a small piece of money, which was burnt upon coals for a perfume, and powdered for particular uses. In his works we find likewise descriptions of powders for several uses, to take off fungous flesh, and to blow into the eyes in ophthalmies, &c.

These were almost all the medicines used by Hippocrates for external purposes. The compound medicines given inwardly were either liquid, solid, or *lambitive*. The liquid ones were prepared either by decoction or infusion in a proper liquor, which, when strained, was kept for use; or by macerating certain powders in such liquors, and so taking them together, or by mixing different kinds of liquors together. The solid medicines consisted of juices inspissated; of gums, resins, or powders, made up with them or with honey, or something proper to give the necessary consistence to the medicine. These were made up in a form and quantity fit to be swallowed with ease. The lambitive was of a consistence between solid and fluid; and the patients were obliged to keep it for some time to dissolve in the mouth, that they might swallow it leisurely. This remedy was used to take off the acrimony of those humours which sometimes fall upon this part, and provoke coughing and other inconveniences. The basis of this last composition was honey. It is worth our observation, that the compound medicines of Hippocrates were but very few, and composed only of four or five ingredients at most; and that he not only understood pharmacy, or the art of compounding medicines, but prepared such as he used himself, or caused his servants prepare them in his house by his directions.

The first physician of eminence who differed considerably in his practice from Hippocrates was Praxagoras. From some authors we learn that he accounted for diseases from the qualities of the humours, of which he reckoned ten sorts, whereas Hippocrates supposed only four. Cælius Aurelianus acquaints us, that he made great use of vomits in his practice, inasmuch as to exhibit them in the iliac passion till the excrements were discharged by the mouth. In this distemper he also advised, when all other means failed, to open the belly, cut the intestine, take out the indurated fæces, and then to sew up all again; but this practice hath not been followed by any subsequent physician.

We must now take notice of a capital distinction among the ancient physicians into the two classes of divided into *dogmatists* and *empirics*; or into those who proceeded according to rules derived from reasoning, and those who, without paying any regard to theory or reasoning, trusted solely to the observations arising from their own experience, or that of others. From what has already been said concerning the theories of Hippocrates, it is very easy to see that the dogmatists were in very great danger of committing errors, if they reasoned from such false and absurd hypotheses as were invented by the philosophers in those ages. The natural fondness of mankind, however, for their own theories, prompted the philosophers to explode experience as much as possible; and accordingly we find, that in the time of Philip, father of Alexander the Great, one Chryssippus, a physician of Cnidos, attempted

61  
His com-  
pound me-  
dicines.

62  
Praxagoras  
the first  
who differ-  
ed from  
Hippo-  
crates.

63  
Physicians  
divided into  
Dogmatists  
and Empi-  
rics.

64  
Chryssippus  
attempted  
to explode the  
ancient  
practice.

tempted to overthrow the practice which had been established on the experience of all the ancient physicians, merely by his talent at declamation and reasoning. He disapproved of venesection and purgatives, though he sometimes made use of purgatives and clysters; but the reasons he had for his conduct cannot now be known, as his books are totally lost.

65  
Doctrines  
of Eras-  
tratus.

Erasistratus, the scholar of Chrysippus, was a physician of great eminence, and flourished in the time of Seleucus Nicator. According to Galen, he entirely banished venesection from medicine; though some affirm that he did not totally discard it, but only used it less frequently than other physicians. His reasons for disapproving of venesection are as follow: "It is difficult to succeed in venesection, because we cannot always see the vein we intend to open, and because we are not sure but we may open an artery instead of a vein. We cannot ascertain the true quantity to be taken. If we take too little, the intention is by no means answered. If we take too much, we run a risk of destroying the patient. The evacuation of the venous blood also is succeeded by that of the spirits, which on that occasion pass from the arteries into the veins. It must likewise be observed, that as the inflammation is formed in the arteries by the blood coagulated in their orifices, venesection must of course be useless and of no effect."

67  
And pur-  
ging.

As Erasistratus did not approve of venesection, so neither did he of purgatives, except very rarely, but exhibited clysters and vomits; as did also his master Chrysippus. He was of opinion, however, that the clysters should be mild; and condemned the large quantity and acrid quality of those used by the ancients. The reason why purgatives were not much used by him was, that he imagined purging and venesection could answer no other purpose than diminishing the fulness of the vessels, and for this purpose he asserted that there were more effectual means than either phlebotomy or purging. He asserted that the humours discharged by cathartics were not the same in the body that they appeared after the discharge; but that the medicines changed their nature, and produced a kind of corruption in them. This opinion has since been embraced by a great number of physicians. He did not believe that purgatives acted by attraction; but substituted in the place of this principle what Mr Le Clerc imagines to be the same with Aristotle's *fuga vacui*. The principal remedy substituted by him in place of purging and venesection was abstinence. When this, in conjunction with clysters and vomits, was not sufficient to eradicate the disease, he then had recourse to exercise. All this was done with a view to diminish the plenitude, which, according to him, was the most frequent cause of all diseases. Galen also informs us, that Erasistratus had so great an opinion of the virtues of fucory in diseases of the viscera and lower belly, and especially in those of the liver, that he took particular pains to describe the method of boiling it, which was, "to boil it in water till it was tender; then to put it into boiling water a second time, in order to destroy its bitterness; afterwards to take it out of the water, and preserve it in a vessel with oil; and lastly, when it is to be used, add a little weak vinegar to it." Nay, so minute and circumstantiate was Erasistratus with regard to the preparation of his fa-

69  
Recom-  
mends ab-  
stinence.

vourite fucory, that he gave orders to tie several of the plants together, because that was the more commodious method of boiling them. The rest of Erasistratus's medicines consisted almost entirely of regimens; to which he added some topical remedies, such as cataplasms, fomentations, and unctions. In short, as he could neither endure compounded medicines, nor superfluous and fine-spun reasonings, he reduced medicine to a very simple and compendious art. But, though hitherto Erasistratus seems to have been a dogmatist, he agreed with the empirics in asserting that we cannot always discover the specific or latent causes of distempers, yet he maintained that in many cases we could discover the immediate causes; and that where we could do so, we ought to employ our reason in order to remove the cause, and thus to cure the distemper.

With regard to surgery, Erasistratus appears to have been very bold; and as an anatomist he is said to have been exceedingly cruel, inasmuch that he dissected criminals while yet alive \*. In a scirrhus li- \* See An-  
ver, or in tumours of that organ, Cælius Aurelianus<sup>10m</sup>, Hist. observes, that Erasistratus made an incision thro' the skin and integuments, and having opened the abdomen he applied medicines immediately to the part affected. But though he was thus bold in performing operations on the liver, yet he did not approve of the paracentesis or tapping in the dropsy; because (said he) the waters being evacuated, the liver, which is inflamed and become hard like a stone, is more pressed by the adjacent parts which the waters kept at a distance from it, so that by this means the patient dies. He declared also against drawing teeth which were not loose, and used to tell those who talked with him on this operation, That in the temple of Apollo there was to be seen an instrument of lead for drawing teeth; in order to intimate that we must not attempt the extirpation of any but such as are loose, and call for no greater force for their extirpation than what may be supposed in an instrument of lead.

Herophilus, the disciple of Praxagoras, and cotem-  
porary of Erasistratus, is said to have been the first physician of the dogmatic sect who made so great an use of medicines both simple and compound, that neither he nor his disciples would undertake the cure of any disorder without them. He seems also to have been the first who treated accurately of the doctrine of pulses, of which Hippocrates, as already observed, had but a superficial knowledge. Galen, however, affirms, that on this subject he involved himself in difficulties and advanced absurdities; which indeed we are not greatly to wonder at, considering the time in which he lived. He took notice of a disease at that time pretty rare, and to which he ascribes certain sudden deaths. He calls it a *palsy of the heart*; and perhaps it may be the same disease with what is now termed the *angina pectoris*.

According to Celsus, it was about this time that medicine was first divided into three branches, viz. the dietetic, the pharmaceutical, and the chirurgurgical medicine. The first of these employed a proper regimen in the cure of diseases; the second, medicines; and the third, the operation of the hands: and the same author informs us, that these three branches became now the business of as many distinct classes of men; so that from this time we may

69  
Was a bold  
surgeon.

70  
Herophilus  
made great  
use of me-  
dicines.

71  
Medicine  
divided in-  
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branches;



may date the origin of the three professions of physicians, apothecaries, and surgeons.— Before this division, those called *physicians* discharged all the several offices belonging to the three professions; and there were only two kinds of them, viz. one called *ἀγρίστοιχοι*, who only gave their advice to the patients, and directions to those of an inferior class, who were called *ἐμπειροί*, and worked with their hands either in the performing operations, or in the composition and application of remedies.

72  
Empiric  
sect found-  
ed by Sera-  
pion.

The first grand revolution which happened in the medicinal art after the days of Herophilus and Erasistratus was occasioned by the founding of the empiric sect by Serapion of Alexandria about 287 years before Christ. The division into dogmatists and empirics had indeed subsisted before, as already mentioned; but about this time the latter party began to grow strong, and to have champions publicly asserting its cause. Galen informs us, that Serapion used Hippocrates very ill in his writings, in which he discovered an excess of pride, self-sufficiency, and contempt for all the physicians that went before him. We have some sketches of his practice in Celsus Aurelianus, from which we may infer that he retained the medicines of Hippocrates and the other physicians who went before him, though he rejected their reasoning. We know not what arguments he advanced for the support of his sentiments, since his works are lost, as well as those of the other empirics; and we should know nothing at all of any of them, if their adversaries had not quoted them in order to confute them.

73  
Doctrine of  
the Empir-  
ics.

The empirics admitted only one general method of obtaining skill in the medical art, which was by experience, called by the Greeks *ἐμπειρία*. From this word they took their name, and refused to be called after the founder or any champion of their sect. They defined experience “a knowledge derived from the evidence of sense.” It was either fortuitous, or acquired by design. For acquiring practical skill they recommended what they called *τῆρσις*, or one's own observation, and the reading of histories or cases faithfully related by others. Hence they thought that we are enabled to know a disease by its resemblance to others; and, when new diseases occurred, to conclude what was proper to be done from the symptoms they had in common with others that were before known. They asserted, that observation ought principally to be employed in two different ways; first in discovering what things are salutary, and what are of an indifferent nature; and, secondly, what particular disease is produced by a certain concurrence of symptoms; for they did not call every symptom a disease, but only such a combination of them as from long experience they found to accompany each other, and produced such disorders as began and terminated in the same manner.

74  
Of the Dog-  
matics.

On the other hand, the dogmatist affirmed, that there was a necessity for knowing the latent as well as the evident causes of diseases, and that the physician ought to understand the natural actions and functions of the human body, which necessarily presupposes a knowledge of the internal parts. By secret or latent causes they meant such as related to the elements or principles of which our bodies are composed, and which are the origins of a good or bad state of

health. They asserted that it was impossible to know how to cure a disease without knowing the cause whence it proceeded; because undoubtedly it behoved them to vary prodigiously in themselves according to the different causes by which they were produced.

The next remarkable person in the history of physic is Asclepiades, who flourished in the century immediately preceding the birth of Christ. He introduced the philosophy of Democritus and Epicurus into medicine, and ridiculed the doctrines of Hippocrates. He asserted, that matter considered in itself was of an unchangeable nature; and that all perceptible bodies were composed of a number of smaller ones, between which there were interspersed an infinity of small spaces totally void of all matter. He thought that the soul itself was composed of these small bodies. He laughed at the principle called *nature* by Hippocrates, and also at the imaginary faculties said by him to be subservient to her; and still more at what he called *attraction*. This last principle Asclepiades denied in every instance, even in that of the loadstone and steel, imagining that this phenomenon proceeded from a concurrence of corpuscles, and a particular disposition or modification of their pores. He also maintained, that nothing happened or was produced without some cause; and that what was called *nature* was in reality no more than *matter* and *motion*. From this last principle he inferred that Hippocrates knew not what he said when he spoke of nature as an intelligent being, and ascribed qualities of different kinds to her. For the same reason he ridiculed the doctrine of Hippocrates with regard to crises; and asserted that the termination of diseases might be as well accounted for from mere matter and motion. He maintained, that we were deceived if we imagined that nature always did good; since it was evident that she often did a great deal of harm. As for the days particularly fixed upon by Hippocrates for crises, or those on which we usually observe a change either for the better or the worse, Asclepiades denied that such alterations happened on those days rather than on others. Nay, he asserted that the crisis did not happen at any time of its own accord, or by the particular determination of nature for the cure of the disorder, but that it depended rather on the address and dexterity of the physician; that we ought never to wait till a distemper terminates of its own accord, but that the physician by his care and medicines must hasten on and advance the cure.— According to him, Hippocrates and other ancient physicians attended their patients rather with a view to observe in what manner they died than in order to cure them; and this under pretence that nature ought to do all herself, without any assistance.

The physiology of Asclepiades, or what we may call such, is as follows. “The particular assemblage, (says he), of the various corpuscles above-mentioned, and represented as of different figures, is the reason why there are several pores or interstices within the common mass, formed by these corpuscles; and why these pores are of a different size. This being taken for granted, as these pores are in all the bodies we observe, it must of course follow that the human body has some peculiar to itself, which, as well as those of all other bodies, contain other minute bodies, which pass and repass by those pores that communicate with

75  
Doctrine of  
Asclepi-  
ades.

76  
Contradicts  
Hippocra-  
tes.

with each other; and as these pores or interstices are larger or smaller, so the corpuscles which pass through them differ proportionably as to largeness and minuteness. The blood consists of the largest of these corpuscles, and the spirits, or the heat, of the smallest."

From these principles the following pathology is deducible: "As long as the corpuscles are freely received by the pores, the body remains in its natural state; and, on the contrary, it begins to recede from that state, when the corpuscles find any obstacle to their passage. Health therefore depends on the just proportion between the pores and the corpuscles they are destined to receive and transmit; as diseases, on the contrary, proceed from a disproportion between these pores and the corpuscles. The most usual obstacle on this occasion proceeds from the corpuscles embracing each other, and being retained in some of their ordinary passages, whether these corpuscles arrive in too large a number, are of irregular figures, move too fast or too slow, &c.

Among the disorders produced by the corpuscles stopping of their own accord, Aesclepiades reckoned phrenesies, lethargies, pleurisies, and burning fevers. Pains, in particular, are classed among the accidents which derive their origin from a stagnation of the largest of all the corpuscles of which the blood consists. Among the disorders produced by the bad state and disposition of the pores, he placed deliquiums, languors, extenuations, leanness, and dropsies, &c. These last disorders he thought proceeded from the pores being too much relaxed and opened: the dropy in particular proceeds from the flesh being perforated with various small holes, which convert the nourishment received into them into water. Hunger, and especially that species of it called *sames canina*, proceeds from the opening the large pores of the stomach and belly; and thirst from an opening of their small ones. Upon the same principles he accounted for intermittent fevers. Quotidian fevers are caused by a retention of the largest corpuscles, those of the tertian kind by a retention of corpuscles somewhat smaller, and quartan fevers are produced by a retention of the smallest corpuscles of all.

77  
Account of  
his prac-  
tice.

The practice of Aesclepiades was suited to remove these imaginary causes of disorders. He composed a book concerning common remedies, which he principally reduced to three, viz. gestation, friction, and the use of wine. By various exercises he proposed to render the pores more open, and to make the juices and small bodies, which cause diseases by their retention, pass more freely; and whereas the former physicians had not recourse to gestation till towards the end of long-continued disorders, and when the patients, tho' entirely free from fever, were yet too weak to take sufficient exercise by walking, Aesclepiades used gestation from the very beginning of the most burning fevers. He laid it down as a maxim, that one fever was to be cured by another; that the strength of the patient was to be exhausted by making him watch and endure thirst to such a degree, that, for the two first days of the disorder, he would not allow them to cool their mouths with a drop of water. Celsus also observes, that though Aesclepiades treated his patients like a butcher during the first days of the disorder, he indulged

them so far afterwards as even to give directions for making their beds in the softest manner. On several occasions Aesclepiades used frictions to open the pores. The dropy was one of the distempers in which this remedy was used; but the most singular attempt was, by this means, to lull phrenetic patients asleep. But though he enjoined exercise so much to the sick, he denied it to those in health; a piece of conduct not a little surprising and extraordinary. He allowed wine freely to patients in fevers, provided the violence of the distemper was somewhat abated. Nor did he forbid it to those who were afflicted with a phrenzy: nay, he ordered them to drink it till they were intoxicated, pretending by that means to make them sleep; because, he said, wine had a narcotic quality and procured sleep, which he thought absolutely necessary for those who laboured under that disorder. To lethargic patients he used it on purpose to excite them, and rouse their senses: he also made them smell strong-scented substances, such as vinegar, castor, and rue, in order to make them sneeze; and applied to their heads cataplasms of mustard made up with vinegar.

Besides these remedies, Aesclepiades enjoined his patients abstinence to an extreme degree. For the first three days, according to Celsus, he allowed them no aliment whatever; but on the fourth began to give them victuals. According to Caelius Aurelianus, however, he began to nourish his patients as soon as the accession of the disease was diminished, not waiting till an entire remission; giving, to some, aliments on the first, to others on the second, to others on the third, and so on to the seventh day. It seems almost incredible to us, that people should be able to fast till this last mentioned term; but Celsus assures us, that abstinence till the seventh day was enjoined by the predecessors of Aesclepiades, and by Heraclides Tarentinus.

The next great revolution which happened in the medicinal art, was brought about by Themison, the disciple of Aesclepiades, who lived not long before the time of Celsus, during the end of the reign of Augustus, or beginning of that of Tiberius. The sect founded by him was called *methodic*, because he endeavoured to find a method of rendering medicine more easy than formerly.

78  
Methodic  
sect found-  
ed by The-  
mison.

He maintained, that a knowledge of the causes of Their disorders was not necessary, provided we have a due regard to what diseases have in common and analogous to one another. In consequence of this principle, he divided all diseases into two, or at most three, kinds. The first included diseases arising from stricture; the second, those arising from relaxation; and the third, those of a mixed nature, or such as partook both of stricture and relaxation.

Themison also asserted, that diseases are sometimes acute, and sometimes chronic; that for a certain time they increase; that at a certain time they are at their height; and that at last they were observed to diminish. Acute diseases, therefore, according to him, must be treated in one way, and chronic ones in another; one method must be followed with such as are in their augmentation, another with such as are at their height, and a third with such as are in their declension. He asserted, that the whole of medicine consisted in the observation of that small number of rules which are founded upon things altogether evident. He

79  
Their doc-  
trines.

said

said, that all disorders, whatever their nature was, if included under any of the kinds abovementioned, ought to be treated precisely in the same way, in whatever country and with whatever symptoms they happen to arise. Upon these principles, he defined medicine to be "a method of conducting to the knowledge of what diseases have in common with each other, and which at the same time is evident."

Themison was old when he laid the foundation of the Methodic sect; and it was only brought to perfection by Themisalus, who lived under the emperor Nero. Galen and Pliny accuse this physician of intolerable insolence and vanity; and report, that he gave himself the air of despising all other physicians: and so intolerable was his vanity, that he assumed the title of *the conqueror of physicians*, which he caused to be put upon his tomb in the Appian way. "Never was mountebank (says Pliny) attended by a greater number of spectators than Themisalus had generally about him; and this circumstance is the less to be wondered at, if we consider that he promised to teach the whole art of medicine in less than six months. In reality, the art might be learned much sooner if it comprehended no more than what the methodists thought necessary: for they cut off the dogmatics examination of the causes of diseases; and substituted in the room of the laborious observations of the empirics, indications drawn from the analogy of diseases, and the mutual resemblance they bear to each other. The most skilful of all the methodic sect, and he who put the last hand to it, was Soranus. He lived under the emperors Trajan and Adrian, and was a native of Ephesus."

One of the most celebrated medicinal writers of antiquity was the Celsus whom we have already had occasion to mention. Most writers agree, that he lived in the time of Tiberius, but his country is uncertain. It is even disputed whether or not he was a professed physician. Certain it is, however, that his books on medicine are the most valuable of all the ancients next to those of Hippocrates. From the latter, indeed, he hath taken so much, as to acquire the name of the *Latin Hippocrates*; but he hath not attached himself to him so closely as to reject the assistance of other authors. In many particulars he has preferred Asclepiades. With him he laughs at the critical days of Hippocrates, and ascribes the invention of them to a foolish and superstitious attachment to the Pythagorean doctrine of numbers. He also rejected the doctrine of Hippocrates with regard to venesection, of which he made a much more general use; but did not take away so much at a time, thinking it much better to repeat the operation than weaken the patient by too great an evacuation at one time. He used cupping also much more frequently, and differed from him with regard to purgatives. In the beginning of disorders, he said, the patients ought to endure hunger and thirst: but afterwards they were to be nourished with good aliments; of which, however, they were not to take too much, nor fill themselves all of a sudden, after having fasted. He does not specify how long the patient ought to practise abstinence; but affirms, that in this particular it is necessary to have a regard to the disease, the patient, the season, the climate, and other circumstances of a like nature.—The signs drawn from the pulse he looked upon to be very precarious

and uncertain. "Some (says he) lay great stress upon the beating of the veins or the arteries; which is a deceitful circumstance, since that beating is slow or quick, and varies very much, according to the age, sex, and constitution of the patient. It even sometimes happens that the pulse is weak and languid when the stomach is disordered, or in the beginning of a fever, though in other respects the body be in a good state; so that we might, in this latter case, be induced to believe, that a man is very weak, when he is just entering into a violent paroxysm, has strength enough left, and may be easily recovered from it. On the contrary, the pulse is often high, and in a violent commotion, when one has been exposed to the sun, or comes out of a bath, or from using exercise; or when one is under the influence of anger, fear, or any other passion. Besides, the pulse is easily changed by the arrival of the physician, in consequence of the patient's anxiety to know what judgment he will pass upon his case. To prevent this, the physician must not feel the patient's pulse on his first arrival: he must first sit down by him, assume a cheerful air, inform himself of his condition; and if he is under any dread, endeavour to remove it by encouraging discourse; after which he may examine the beating of the artery. This nevertheless does not hinder us from concluding, that if the sight of the physician alone can produce so remarkable a change in the pulse, a thousand other causes may produce the same effect."

About the 131st year after Christ, in the reign of the emperor Adrian, lived the celebrated Galen, a native of Pergamus, whose name makes such a conspicuous figure in the history of physic. At this time the dogmatic, empiric, methodic, and other sects, had each their abettors. The methodics were held in great esteem, and looked upon to be superior to the dogmatics, who were strangely divided among themselves, some of them following Hippocrates, others Erasistratus, and others Asclepiades. The empirics made the least considerable figure of any. Galen undertook the reformation of medicine, and restored dogmatism. He seems to have been of that sect which was called *eclectic*, from their choosing out of different authors what they esteemed good in them, without being particularly attached to any one more than the rest. This declaration he indeed sets out with; but, notwithstanding this, he follows Hippocrates much more than any of the rest, or rather follows nobody else but him. Though before his time several physicians had commented on the works of Hippocrates, yet Galen pretends that none of them had understood his meaning besides himself. His first attempt therefore was to explain the works of Hippocrates; with which view he wrote a great deal, and after this let about composing a system of his own. In one of his books entitled, "Of the establishment of medicine," he defines the art to be one which teaches to preserve health and cure diseases. In another book, however, he proposes the following definition: "Medicine (says he) is a science which teaches what is found, and what is not so; and what is of an indeterminate nature, or holds a medium between what is found and what is the reverse." He affirmed, that there are three things which constitute the object of medicine, and which the physician ought to consider as found, as

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This sect  
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81  
Doctrine of  
Celsus.

82  
Account of  
Galen.

82  
He put no  
confidence  
in signs  
drawn from  
the pulse.



not found, or of a neutral and indifferent nature. These are the body itself, the signs, and the causes. He esteems the human body found, when it is in a good state or habit with regard to the simple parts of which it is composed, and when besides there is a just proportion between the organs formed of these simple parts. On the contrary, the body is reckoned to be unbound, when it recedes from that state, and the just proportion abovementioned. It is in a state of neutrality or indifference, when it is in a medium between soundness and its opposite state. The salutary signs are such as indicate present health, and prognosticate that the man may remain in that state for the time to come. The insalubrious signs, on the contrary, indicate a present disorder, or lay a foundation for suspecting the approach of one. The neutral signs, or such as are of an indifferent nature, denote neither health nor indisposition, either for the present, or for the time to come. In like manner he speaks of causes salutary, unsalutary, and indifferent.

These three dispositions of the human body, that is, soundness, its reverse, and a neutral state, comprehend all the differences between health, and disorder, and indisposition: and each of these three states or dispositions has a certain extent peculiar to itself. A sound habit of body, according to the definition of it already given, is very rare, and perhaps never to be met with; but this does not hinder us to suppose such a model for regulating our judgment with respect to different constitutions. On this principle Galen establishes eight other principal constitutions, all of which differ more or less from the perfect model abovementioned. The four first are such as have one of the four qualities of hot, cold, moist, or dry, prevailing in too great a degree; and accordingly receive their denomination from that quality which prevails over the rest. The four other species of constitutions receive their denominations from a combination of the abovementioned; so that, according to his definition, there may be a hot and dry, a hot and moist, a cold and moist, and a cold and dry constitution. Besides these differences, there are certain others which result from occult and latent causes, and which, by Galen, are said to arise from an *idiosyncrasy* of constitution. It is owing to this *idiosyncrasy*, that some have an aversion to one kind of aliment and some to another, that some cannot endure particular smells, &c. But though these eight last mentioned constitutions fall short of the perfection of the first, it does not thence follow, that those to whom they belong are to be classed among the vultuinary and diseased. A disease only begins when the deviation becomes so great as to hinder the action of the parts.

Galen describes at great length the signs of a good or bad constitution, as well as those of what he calls a *neutral habit*. These signs are drawn from the original qualities of cold, hot, moist, and dry, and from their just proportion or disproportion with respect to the bulk, figure, and situation, of the organical parts. With Hippocrates he establishes three principles of an animal-body; the parts, the humours, and the spirits. By the parts he properly meant no more than the solid parts; and these he divided into similar and organical. Like Hippocrates he also acknowledged four humours; the blood, the phlegm, the yellow and

black bile; and of these he gave the same definitions with those already taken notice of under Hippocrates. He established three different kinds of spirits; the vital, the animal, and the natural. The first of these are, according to him, nothing else but a subtle vapour arising from the blood, which draws its origin from the liver, the organ, or instrument of sanguification. After these spirits are conveyed to the heart, they, in conjunction with the air we draw into the lungs, become the matter of the second species, that is, of the vital spirits, which are again changed into those of the animal kind in the brain. He supposed that these three species of spirits served as instruments to three kinds of faculties, which reside in the respective parts where these faculties are formed. The natural faculty is the first of these, which he placed in the liver, and imagined to preside over the nutrition, growth, and generation, of the animal. The vital faculty he lodged in the heart, and supposed that by means of the arteries it communicated warmth and life to all the body. The animal faculty, the noblest of all the three, and with which the reasoning or governing faculty was joined, according to him, has its seat in the brain; and, by means of the nerves, distributes a power of motion and sensation to all the parts, and presides over all the other faculties. The original source or principle of motion in all these faculties, Galen, as well as Hippocrates, defines to be *Nature*.

Upon these principles Galen defined a disease to be "such a preternatural disposition or affection of the parts of the body, as primarily, and of itself, hinders their natural and proper action." He established three principal kinds of diseases: the first relates to the similar parts; the second, to the organical; and the third is common to both these parts. The first kind of diseases consists in the intemperature of the similar parts; and this is divided into an intemperature *without matter*, and an intemperature *with matter*. The first discovers itself when a part has more or less heat or cold than it ought to have without that change of quality in the part being supported and maintained by any matter. Thus, for instance, a person's head may be overheated and indisposed by being exposed to the heat of the sun, without that heat being maintained by the continuance or congestion of any hot humour in the part. The second sort of intemperature is when any part is not only rendered hot or cold, but also filled with a hot or cold humour, which are the causes of the heat or cold felt in the part. Galen also acknowledged a simple intemperature: that is, when one of the original qualities, such as heat or cold, exceeds alone and separately; and a compound intemperature, when two qualities are joined together, such as heat and dryness, or coldness and humidity. He also established an equal and unequal temperature. The former is that which is equally in all the body, or in any particular part of it, and which creates no pain, because it is become habitual, such as dryness in the hectic constitution. The latter is distinguished from the former, in that it does not equally subsist in the whole of the body, or in the whole of a part. Of this kind of intemperature we have examples in certain fevers, where heat and cold, equally, and almost at the same time, attack the same part; or in other fevers, which render the surface of the body cold as ice, while the

inter-

internal parts burn with heat; or lastly, in cases where the stomach is cold and the liver hot.

The second kind of disorders, relating to the organical parts, results from irregularities of these parts, with respect to the number, bulk, figure, situation, &c.; as when one has six fingers, or only four; when one has any part larger or smaller than it ought to be, &c. The third kind, which is common both to the similar and the organical parts, is a solution of continuity, which happens when any similar or compound part is cut, bruised, or corroded.

Like Hippocrates, Galen distinguished diseases into acute and chronic; and, with respect to their nature and genius, into benign and malignant; also into epidemic, endemic, and sporadic.

After having distinguished the kinds of diseases, Galen comes to explain the causes; which he divides into external and internal. The external causes of diseases, according to him, are six things, which contribute to the preservation of health when they are well disposed and properly used, but produce a contrary effect when they are imprudently used or ill disposed. These six things are, the air, aliments and drink, motion and rest, sleeping and watching, retention and excretion, and lastly the passions. All these are called the *procatartetic* or *beginning* causes, because they put in motion the internal causes; which are of two kinds, the *antecedent* and the *consequent*. The former is discovered only by reasoning; and consists for the most part in a peccancy of the humours, either by plenitude or cacochymy, *i. e.* a bad state of them. When the humours are in too large a quantity, the case is called a *plethora*; but we must observe, that this word equally denotes too large a quantity of all the humours together, or a redundancy of one particular humour which prevails over the rest. According to these principles, there may be a sanguine, a bilious, a pituitous, or a melancholy plenitude; but there is this difference between the sanguine and the three other plenitudes, that the blood, which is the matter of the former, may far surpass the rest; whereas, if any of the three last mentioned ones do so, the case is no longer called *plenitude*, but *cacochymy*; because these humours, abounding more than they ought, corrupt the blood. The causes he also divides into such as are manifest and evident, and such as are latent and obscure. The first are such as spontaneously come under the cognizance of our senses when they act or produce their effects: the second are not of themselves perceptible, but may be discovered by reasoning; the third sort, *i. e.* such as he calls *occult* or *concealed*, cannot be discovered at all. Among this last he places the cause of the hydrophobia.

He next proceeds to consider the symptoms of diseases. A symptom he defines to be "a preternatural affection depending upon a disease, or which follows it as a shadow does a body." He acknowledged three kinds of symptoms: the first and most considerable of these consisted in the action of the parts being injured or hindered; the second in a change of the quality of the parts, their actions in the mean time remaining entire; the third related to defects in point of excretion and retention.

After having treated of symptoms, Galen treats of the signs of diseases. These are divided into *diag-*  
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*nostic* and *prognostic*. The first are so called because they enable us to know diseases, and distinguish them from each other. They are of two sorts, *pathognomic* and *adjunct*. The first are peculiar to every disease, make known its precise species, and always accompany it, so that they begin and end with it. The second are common to several diseases, and only serve to point out the difference between diseases of the same species. In a pleurisy, for instance, the pathognomic signs are a cough, a difficulty of breathing, a pain of the side, and a continued fever. The adjunct signs are the various sorts of matter expectorated, which are sometimes bloody, sometimes bilious, &c.—The diagnostic signs were drawn from the defective or disordered disposition of the parts, or from the diseases themselves; secondly, from the causes of diseases; thirdly, from their symptoms; and lastly, from the particular dispositions of each body, from things which prove prejudicial and those that do service, and from epidemical diseases.—The prognostic signs he gathered from the species, virulence, and peculiar genius of the disease; but as we have already spoken so largely concerning the prognostics of Hippocrates, it is superfluous to be particular on those of Galen.—His method of cure differed little from that of Hippocrates: but from the specimen already given of Galen's method of teaching the medicinal art, it is evident that his system was little else than a heap of speculations, distinctions, and reasonings; whereas that of Hippocrates was founded immediately upon facts, which he had either observed himself, or had from the observation of others.

In consequence of the establishment of such a system, the medicinal art, as well as others during the dark ages of popery, came to be reduced to a heap of quibbling distinctions and metaphysical nonsense.—After the days of Galen, however, the knowledge of medicine did not immediately decline. Dr Freind is of opinion that it continued to advance till the year 600. He censures Mr Le Clerc for placing the physicians Oribasius, Aëtius, Alexander, and Paulus Aegineta, all without any distinction, in the fourth century; and still more for placing Diocles Carystius 500 years after Christ, when he should, according to him, have been placed 300 years before him.

Oribasius flourished about the year 360, and was physician to the emperor Julian. He speaks very fully of the effects of bleeding by way of scarification, a thing little taken notice of by former writers: from his own experience he assures us that he had found it successful in a suppression of the menses, distensions of the eyes, headach, and straitness of breathing even when the person was extremely old. He tells his own case particularly, when the plague raged in Asia, and he himself was taken ill, that the second day he scarified his leg, and took away two pounds of blood; by which method he entirely recovered, as did several others who used it. In this author also we find the first description of a surprising and terrible distemper called *λυκαῦνθρονια*, a species of melancholy and mad-ness, which he describes thus. "The persons affected go out of their houses in the night-time, and in every thing imitate wolves, and wander among the sepulchres of the dead till day break. You may know them by these symptoms: Their looks are pale; their eyes

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between the  
Hippocratic  
and Galenic  
systems.

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Account of  
Oribasius.

86

New dis-  
temper de-  
scribed by  
him.

heavy, hollow, dry, without the least moisture of a tear; their tongue exceedingly parched and dry, no spittle in their mouth, extreme thirst; their legs, from the falls and the bruises they receive, full of incurable sores and ulcers." Aëtius adds, that at day-break they return home, and come to their senses. This description resembles that of the demoniac cured by our Saviour, and this man's *possession* was probably a species of the same madness.

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Aëtius.

Aëtius lived very near the end of the fifth, or in the beginning of the sixth century. Many passages in his writings serve to shew us how much the actual and potential cautery were used by the physicians of that age. In a palsy, he says from the works of another physician, that he should not at all hesitate to make an eschar either way, and this in several places; one in the nape, where the spinal marrow takes its rise, two on each side of it; three or four on the top of the head, one just in the middle, and the three others round it. He adds, that in this case, if the ulcers continue running a good while, he should not doubt of a perfect recovery. He is still more particular when he comes to order this application for an inveterate asthma, after all other remedies have been tried in vain. One, he says, should be made on each side near the middle of the joining of the clavicle, taking care not to touch the wind-pipe: two other little ones are then to be made near the carotids under the chin, one on each side, so that the caustic may penetrate no further than the skin; two others under the breasts, between the third and fourth ribs; and again, two more backwards towards the fifth and sixth ribs. Besides these there ought to be one in the middle of the thorax near the beginning of the xiphoid cartilage over the orifice of the stomach; one on each side between the eighth and ninth ribs; and three others in the back, one in the middle, and the two others just below it, on each side of the vertebrae. Those below the neck ought to be pretty large, not very superficial, nor very deep; and all these ulcers should be kept open for a very long time.

The use of issues was indeed known to Hippocrates. They used both the actual and potential cautery for making them; the former of which is preferred by many, because the eschar made by it separates much sooner than the other. The most considerable difference between the ancient and modern practice with regard to issues is, that the ancient physicians sometimes made them near a bone, as in the nape, the clavicles, &c. where if any thing is put in to keep the issue open, it must press upon the periosteum, and create great pain; besides that in such a part the discharge, on which the cure chiefly depends, can never be so considerable. As for that particular species of issues called *stanni*, we find them plainly described by Langfranc, above 400 years ago; and if we examine into the writers before Langfranc, we shall find the practice still more ancient. Roland, who lived in the 13th century, not only mentions the thing, but uses the very word, and gives a description how the needle with the thread should be passed.

Aëtius takes notice of the worms bred in different parts of the body called *dracunculi*, which were unknown to Galen.—He seems also to be the first Greek

writer among the Christians who gives us any specimen of medicinal spells and charms; such as that of a finger of St Blasius for removing a bone which sticks in the throat, and another in relation to a fistula. He gives a remedy for the gout, which he calls the *grand drier*: the patient is to use it for a whole year, and observe the following diet each month. "In September, he must eat and drink milk: in October, he must eat garlic; in November, abstain from bathing; in December, he must eat no cabbage; in January, he is to take a glass of pure wine in the morning; in February, to eat no beet; in March, to mix sweet things both in eatables and drinkables; in April, not to eat horse-radish, nor in May the fish called *polypus*; in June, to drink cold water in a morning; in July, to avoid venery; and lastly, in August to eat no mallows." This may sufficiently shew the quackery of those times, and how superstition was beginning to mix itself with the art.

Alexander, who flourished in the reign of Justinian, is a more original author than either of the two former. He confines himself directly to the describing the signs of diseases, and the methods of cure, without meddling with anatomy, the materia medica, or surgery, as all the rest did. He employs a whole book in treating of the gout. One method he takes of relieving this disease is by purging; and in most of the purges he recommends hermodactyls, of which he has a great opinion.—In a caufus, or burning fever, where the bile is predominant, the matter fit for evacuation, and the fever not violent, he prefers purging to bleeding, and says that he has often ordered purging in acute fevers; which method, says Dr Freind, when used with judgment, is frequently attended with surprising success.—In the caufus also, if a syncope happens from crude and redundant humours, he recommends bleeding. In a syncope succeeding the suppression of any usual evacuation, he recommends bleeding, with frictions. The diagnostics upon which he founds this practice are the following; viz. a face paler and more swelled than usual, a bloated habit of body, with a little sluggish pulse, having long intervals between the strokes.—In tertian, and much more in quartan fevers, he recommends vomits above all other remedies, and asserts that by this remedy alone he has cured the most inveterate quartans.—On the bulimus, or canine appetite, he makes a new observation, viz. that it is sometimes caused by worms. He mentions the case of a woman who laboured under this ravenous appetite, and had a perpetual gnawing at her stomach and pain in her head: after taking *hiera*, she voided a worm above a dozen of cubits long, and was entirely cured of her complaints.—He is also the first author who takes notice of *rhubarb*; which he recommends in a weakness of the liver and dysentery.—Alexander is recommended by Dr Freind as one of the best practical writers among the ancients, and well worthy the perusal of any modern.

Paulus was born in the island Aëgina, and lived in Paulus the 7th century. He transcribes a great deal from Aëginus the Alexandrian and other physicians. His descriptions are short and full. He treats particularly of womens disorders; and seems to be the first instance upon record of a professed *man-midwife*, for so he was called by the Arabians: and accordingly he begins his book with

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Alexander.

89

Paulus Aëginus.



with the disorders incident to pregnant women. He treats also very fully of surgery; and gives some directions, according to Dr Freind, not to be found in the more ancient writers.

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Account of  
the Arabian  
physicians.

With this physician closes the period of the Greek classical physicians. As for the western parts of the world, every art and science had been long lost in them, by the inundation of Goths and other barbarous nations who over-ran the Roman empire. The Arabians, who about this time over-ran the eastern parts of the world, were at first as great enemies to learning of all kinds as the Goths; but at length they applied themselves to the study of several sciences, particularly medicine. They were for the most part, indeed, only copiers of the Greeks; we are, however, indebted to them for some improvements. They were the first who introduced chemical remedies, though of these they used but few, nor did they make any considerable progress in the chemical art. Anatomy was not in the least improved by them, nor did surgery receive any advancement till the time of Albucasis, who lived, probably, in the 12th century. They added a great deal to botany and the materia medica, by the introduction of new drugs, of the aromatic kind especially, from the east, many of which are of considerable use. They also found out the way of making sugar; and by help of that, syrups; which two new materials are of great use in mixing up compound medicines.

91  
Dispute  
concerning  
blood let-  
ting.

With regard to their practice, in some few particulars they deviated from the Greeks. Their purging medicines were much milder than those formerly in use; and even when they did prescribe the old ones, they gave them in a much less dose than formerly. The same reflection may be made concerning their manner of bleeding, which was never to that excessive degree practised by the Greeks. They deviated from Hippocrates, however, in one very trivial circumstance, which produced a terrible controversy. The question was, Whether blood in a pleurisy ought to be drawn from the arm of the affected side, or the opposite. Hippocrates had directed it to be drawn from the arm of the affected side; but the Arabians, following some other ancient physicians, ordered it to be drawn from the opposite one. Such was the ignorance of those ages, that the university of Salamanca in Spain made a decree, that no one should dare to let blood but in the contrary arm; and endeavoured to procure an edict from the emperor Charles V. to second it; alleging that the other method was of no less pernicious consequence to medicine, than Luther's heresy had been to religion.

92  
Arabian  
physicians  
mostly ap-  
plauded.

By reason of the general decay of learning in the western parts of the world, the Greek writers became totally forgot, because nobody could read the language; and the Arabians, though mostly copiers from them, enjoyed all the reputation that was due to the others. The Arabian physic was introduced into Europe very early, with the most extravagant applause; and not only this, but other branches of their learning came into repute in the west; inasmuch that in the 11th century, the studies of natural philosophy and the liberal arts were called *the studies of the Saracens*. This was owing partly to the crusades undertaken against them by the European princes; and

partly to the settlement of the Moors in Spain, and the intercourse they and other Arabians had with the Italians. For, long before the time of the crusades, probably in the middle of the 7th century, there were Hebrew, Arabic, and Latin professors of physic settled at Salerno: which place soon grew into such credit, that Charles the Great thought proper to found a college there in the year 802; the only one at that time in Europe. Constantine the African flourished here towards the latter end of the 11th century. He was a native of Carthage; but travelled into the east, and spent 30 years in Babylon and Bagdad, by which means he became master of the oriental languages and learning. He returned to Carthage; but being informed of an attempt against his life, made his escape into Apulia, where he was recommended to Robert Guiscard, created, in 1060, duke of that country, who made him his secretary. He was reputed to be very well versed in the Greek, as well as the eastern tongues; and seems to have been the first who introduced either the Greek or Arabian physic into Italy. His works, however, contain nothing that is new, or material; though he was then counted a very learned man, and for that age no doubt was so.

93  
College of  
Salernum  
founded.

From this time to the end of the 15th and beginning of the 16th century, the history of physic furnishes us with no interesting particulars. This period, however, is famous for the introduction of chemistry into medicine, and the discovery of three new dilemperers, the sweating sickness, the venereal disease, and the scurvy. The sweating sickness began in 1483, in the army of Henry VII. upon his landing at Milford-haven, and spread itself at London from the 21st of September to the end of October. It returned here five times, and always in summer; first in 1485, then in 1506, afterwards in 1517, when it was so violent that it killed many in the space of three hours, so that numbers of the nobility died, and of the commonalty in several towns often the one-half perished. It appeared the fourth time in 1528, and then proved mortal in six hours; many of the courtiers died of it, and Henry VIII. himself was in danger. In 1529, and only then, it infected the Netherlands and Germany, in which last country it did much mischief. The last return of it was in 1551, and in Westminster it carried off 120 in a day. Dr Caius describes it as a pestilent contagious fever, of the duration of one natural day: the sweat he reckoned to be only a natural symptom, or crisis of the dilemper. It first affected some particular part, attended with inward heat and burning, unquenchable thirst, restlessness, sickness at stomach but seldom vomiting, head-ach, delirium, then faintness, and excessive drowsiness. The pulse was quick and vehement, and the breath short and labouring. Children, poor and old people, were less subject to it. Of others, scarce any escaped the attack, and most of them died. Even by travelling into France or Flanders they did not escape; and, what is still more strange, the Scots were not affected: abroad the English only were seized, and foreigners in England were free. At first the physicians were much puzzled how to treat this disease. The only cure they ever found, however, was to carry on the sweat for a long time; for, if stopped, it was dangerous or fatal. The way

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Appear-  
ance of the  
sweating  
sickness.

therefore was to be patient and lie still, and not catch cold. If nature was not strong enough to force out the sweat, it was necessary to assist her by art, with cloaths, wine, &c. The violence of the distemper was over in 15 hours; but there was no security for the patient till 24 were passed. In some strong constitutions there was a necessity to repeat the sweating; even to 12 times. The removing out of bed was attended with great danger; some who had not sweated enough fell into very ill fevers. No flesh-meat was to be allowed in all the time of the distemper; nor drink for the first five hours. In the seventh, the distemper increased; in the ninth the delirium came on, and sleep was by all means to be avoided. However terrible this distemper appeared at first, it seldom proved obdurate if treated in the above-mentioned manner.

<sup>95</sup> Chemistry introduced into medicine by Paracelsus. In the beginning of the 16th century, the famous chemist Paracelsus introduced a new system into medicine, founded on the principles of his art. The Galenical system had prevailed till his time; but their practice had greatly degenerated, and was become quite trifling and frivolous. The physicians rejected the use of opium, mercury, and other efficacious remedies. Paracelsus, who made use of these, had therefore greatly the advantage over them; and now all things relating to medicine were explained on imaginary chemical principles. It will easily be conceived that a practice founded in this manner could be no other than the most dangerous quackery. At this time, however, it was necessary; for now a new disease over-ran the world, and threatened greater destruction than almost all the old ones put together, both by the violence of its symptoms, and its baffling the most powerful remedies at that time known.—

<sup>96</sup> Appearance of the venereal disease. This was the venereal disease, which is said to have been imported from the West-Indies by the companions of Christopher Columbus. Its first remarkable appearance was at the siege of Naples in 1494, from whence it was soon after propagated through Europe, Asia, and Africa. The symptoms with which it made the attack at that time were exceedingly violent, much

more so than they are at present; and consequently were utterly unconquerable by the Galenists. The quacks and chemists, who boldly ventured on mercury, though they no doubt destroyed numbers by their excessive use of it, yet shewed that a remedy for this terrible distemper was at last found out, and that a proper method of treating it might soon be fallen upon. Shortly after, the West-Indian specific, guaiacum, was discovered: the materia medica was enriched with that and many other valuable medicines, both from the East and West-Indies; which contributed considerably to the improvement of the practice of physic. The scurvy likewise began to spread during the course of this century. It had first appeared, in 1486, in Misnia; where it not only proved very dangerous, but was also contagious. It probably owed its origin to an unwholesome sea-diet. The mariners of Saxony called it *scharbock*, which, in their language, signifies inflammation; and this it seems was one way in which it at first appeared, and terminated often in a gangrene. It broke out among the Portuguese sailors in some of their voyages to the East-Indies, and in 1600 spread itself through the most of Europe; nor were the proper remedies for it discovered till very lately.

The revival of learning, which now took place throughout Europe, the appearance of these new distempers, and the natural fondness of mankind for novelty, contributed greatly to promote the advancement of medicine as well as other sciences. It was not, however, till the year 1628 that a foundation of the was laid for a solid and rational system. This was blood discovered. done by Dr Harvey, who discovered the circulation of the blood; which may justly be reckoned the most capital discovery that ever was made with regard to the practice of medicine. The immediate consequences of it were, that all the vain and fanciful theories of the ancients were thrown aside, and others more rational established in their place. How far these have yet been ascertained, so as to be safely taken for a direction to the practical physician in all cases, we now proceed to inquire.

## PART I. THEORY OF MEDICINE.

### SECT. I. General account of Theories to the time of HOFFMAN.

<sup>97</sup> Mathematical or mechanical theory. BEFORE the time of Harvey, who discovered the circulation of the blood, though every physician had some kind of theory of his own, yet, as all of these were built upon principles in themselves erroneous, and inconsistent with what has been since discovered concerning the structure of the human body, they are now quite unworthy of notice. But, on the discovery of the circulation of the blood, matters took a different turn, and physicians began to aim at establishing a theory of medicine upon more solid and consistent principles. It was generally agreed, that the circulation was the capital and vital function of the body, and that upon it the life and health did immediately depend. The blood was considered as it were the *primum mobile* of the whole body; and to something

in the blood all the disorders to which the human race are liable, were thought to be owing.

About this time, also, the laws of mechanics began to be better and more generally understood; and various theories were formed with a design to account for all the phenomena of the human body upon mathematical or mechanical principles. Calculations were made concerning the diameters of the vessels, their gradual diminution, the friction of the blood against their sides, the force of the heart, &c. Thus were mathematics introduced into physic, and every thing relative to the human body was thought to be performed by the mere force of such mechanical powers as we are acquainted with, and whose effects we observe in pumps, steam-engines, and other hydraulic machines.

This consequences of this doctrine, however, soon destroyed the principles on which it was founded; and such prodigious powers were attributed to the action of some parts of the body, as were much more than sufficient

**THEORY.** sufficient to destroy the texture of the parts themselves. Digestion, for example, was thought to be accomplished by the mere mechanical pressure of the stomach upon the aliments contained in it, and Dr Pitcairn calculated this pressure at more than 5000 pounds weight: but, by a strange and almost unaccountable oversight, he did not advert, that upon his hypothesis the soft texture of the viscous would have been totally destroyed by the hardness of some parts of the aliments swallowed even by the human species, and much more in other animals; as we see that dogs will swallow and digest even the hardest bones. The immense differences also between the calculations of different mathematicians, shewed evidently, that either some other power than mere mechanism was concerned in the operations of the human body, or that its mechanism was of a different kind from that which takes place in machines constructed by art.

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Theory of  
Stahl.

The greatest difficulty the mechanical physicians had to encounter arose from the phenomena of muscular motion. The force of the muscles in contraction is observed to be so great, that it seems scarce possible to account for it upon mechanical principles. Attempts were made indeed to overcome this difficulty. The muscular fibres were supposed to be full of small cells, which, being inflated by the animal-spirits derived from the brain through the nerves, shortened the length of the muscle, and thus caused it to contract. But, even allowing this hypothesis to be true, another difficulty, equally great, arose from it; namely, to account for the origin of this prodigious power attributed to the animal-spirits. To evade this difficulty, Stahl maintained, that the rational and immaterial soul itself was the source of all the motions of the human body; and that by the direction of this spiritual being every thing was conducted, both with relation to the motion of the muscle, and to every function both vital and natural.

The consequences of this system were still worse than those of the former; for now metaphysics were superadded to mathematics, and physicians were tempted to neglect the anatomy of the body, and to intermeddle with spiritual subjects which they could by no means comprehend. Neither could the most rigid Stahlians deny, that in many cases the human body is subject to the common laws of mechanism; so that their system, instead of explaining, tended to set aside all kind of reasoning, and to involve every thing in darkness.

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Dr Boerhaave's theory.

But, besides the mechanical theory, another was invented soon after Harvey's discovery of the circulation, by which every thing was ascribed to an alteration in the quality of the blood itself. This took its rise principally from some microscopic observations of Lewenhoeck; and was adopted by Boerhaave, who hath most fully explained it. He begins with considering the diseases arising from a weakness and laxity of the ultimate and finest fibres of the human body. This, he says, is immediately owing to an obstruction in the conversion of the aliments into healthy juices: and this again to too great a consumption of good fluids, to the sluggishness of the power of the solids over the fluids, or the too great viscosity of the aliments themselves; or it may arise from too weak a motion in the fluids, proceeding chiefly from a defect of muscular mo-

tion, or from too great a pulling of the fibre, next to breaking.

Opposite to these are the diseases arising from fibres too stiff and elastic. These are produced by the use of strong aliments, exercise, acid and astringent medicines, and in short by every thing that tends to increase the strength of the body.

The simple fibres (or the ultimate and finest fibres of the body), interwoven with each other, according to our author, form the most simple membrane; and this formed into a hollow tube, makes one of the least kind of vessels. If many of the smallest fibres are twisted together in the formation of the membrane, it will be proportionably thicker, and the vessels formed of it will, in like manner, be so much stronger; and hence proceed the diseases of weak and lax, and of too stiff and elastic, viscera.

Our author next considers the most simple and spontaneous defects of our fluids. These are either from the prevalence of an acid, which is again produced by the eating of acid vegetable food, or taking fermented liquors in too great quantity; or from a spontaneous gluten arising from the use of crude and farinaceous aliments, &c.; or from an alkali. This last is produced by the use of animal food, especially such as has a putrid taint, and the use of alkalescent vegetables, &c.

Besides all these, however, he says, there are disorders arising merely from a too great increase of circulatory motion. The immediate cause of this increase is the more frequent and strong contraction of the heart. This again happens when the brain and cerebellum are so strongly compressed, that they send forth too great a quantity of the nervous juice; as in passions of the mind, or in pains. It may arise also from an irritation of the heart itself, either by the blood returning more quickly to it, occasioned by muscular motion, or to some acrimony present in the blood itself.

Opposite to these are the diseases which proceed from a deficiency of the circulation, or from plethora. The first is produced by the spontaneous degeneracy of the humours already mentioned; the second is a greater quantity of well-conditioned blood than what is capable of undergoing those changes which must necessarily happen in life, unless distempers intervene and disturb them. It is produced by every thing which makes a quantity of good chyle and blood, at the same time hindering their attenuation, consumption, and perspiration through the pores of the skin.

He next goes on to consider the diseases proceeding from the least compound obstructions, and from wounds. An obstruction is the shutting up of a canal, and denying the passage to a fluid which should flow through the same. This may proceed from the narrowness of the vessel, the bigness of the presenting body, or from both taken together. The vessel may become too narrow from outward pressure, from its own contraction, or from its sides growing thicker. The bulk of the small bodies contained in the vessels becomes too great, either by the sliminess of the fluid, or their having mistaken their passage; and when these two meet together, the obstruction is more obdurate and difficult to remove. The bulk of the fluid parts is increased to such a degree as to render them incapable

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His account of disorders from an increased circulation.

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From a plethora and deficiency in the circulation.

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Of obstructions and wounds.



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pable of flowing, 1. Either by changing their spherical figure into another, presenting itself in a larger size to the mouth of the canal; or, 2. By the joining together, into one, several particles which were single before. The figure is chiefly altered when that even pressure of the smallest particles, now left to their own elasticity which used to work and press together from all sides equally, is ceased; that is, when the motion is become languid, or the vessel relaxed; or when the quantity of liquid is lessened. The particles run into one, by too much rest; by cold; frost; drying; heat; a violent circular motion, and the pressure of a strong vessel; by an acid, austere, spirituous, and absorbing coagulum; by a slime; or by an oil. The particles of fluids having mistaken their passage, are stopped when a small body of them runs into the dilated mouth of a canal, through the extremities of which they cannot pass. This dilatation is chiefly occasioned by a fullness, an increased motion, a rarefaction of the fluid, and relaxation of the vessel; and most of all these are soon succeeded by their contraries: "Which is the immediate cause of all colds."

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Of inflammation.

An inflammation he defines to be an attrition of the red arterial blood stagnating in the smallest vessels; occasioned by the motion of the blood circulating with greater force in the larger vessels. This stagnation is occasioned in the smallest arteries by whatever makes the ends of the vessels in their cones and cylinders so narrow that the diameter of their orifices is made less than the globules of the blood; the causes whereof may be heat, violent motion, foreign bodies stuck in, ligatures, the taking inwardly, or applying to the surface of the body, sharp subtilances of various kinds, cold, too great rubbing, &c. An inflammation is likewise produced by every thing that shuts up the passages, and at the same time applies to them either inwardly or outwardly such acrimonious bodies as are both oily and saline: Also by such things as occasion the blood to settle and coagulate in the body; as too violent motions, a draining of the thinnest parts by sweating, urine, spitting, looseness, serous eruptions, and all such things as coagulate, whether medicines or poisons. In the lymphatic arterial vessels, an inflammation is produced, 1. By all the causes which render their mouths sufficiently wide to admit the gross parts of the blood, which, being driven in deeper, meet with narrow passages that give way; and, 2. By all the causes of inflammation in the blood-vessels, so that this disease may take place in every conic vessel through which the red blood flows from the wide to the narrow end.

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Of fever.

Fever is inseparably connected with inflammation. To have a just notion of the cause of it, Dr Boerhaave says, it will be necessary to choose from the innumerable symptoms that occur in all the variety of fevers, some general ones that are common to all; the presence of which makes the physician sensible that his patient has a fever: then, from the consideration of these, the individual and specific nature of the fever is to be found out. In every fever produced by an internal cause, there are to be observed, at some times and in some degree, a shivering, a quick pulse, and a heat. These are present in all fevers; but of the three, there is only the quick pulse which is present from the beginning to the end; so that the physician may from that single phenomenon conclude whether a fever is present or not. The

proximate or nearest cause of this quickness is there-fore also the proximate cause of the fever. The quickness of the pulse is immediately produced by the quicker contraction of the heart; and that again by the too quick reciprocal influx of the nervous juice, and that of the cerebellum, into the muscles and ventricles of the heart. Almost every fever begins, as already observed, with a sense of coldness, shivering and shaking, greater or less, according to the different constitution of the patient, or the nature of the fever itself. At this time the pulse is quick, small, and often intermitting; the extremities frequently pale, cold, stiff, trembling, and void of feeling: whence it appears, that then the blood stagnates at the ends of the capillary vessels, at the same time that there is present some cause which irritates the heart.

In all fevers, after the symptoms already mentioned, there arises a heat; which is greater or less, of a longer or shorter continuance, according to the different nature of the fever. This heat, as it follows the pre-existent fever, ought rather to be taken for its effect than its cause, so that the too quick contraction of the heart, with an increased resistance at the extremities of the capillary vessels, is sufficient to give us a just idea of all acute fevers; that is, such as quickly pass off, with danger to the patient. Either of these two (*viz.* the quick contraction of the heart, or the resistance in the capillary vessels) may be occasioned, in a living animal, by an infinite number and variety of causes: which, however, are divided, according as they are either singular or proper to each, or as they are universal and common to many; and these last are generally owing to the use of the same air, diet, and manner of living, by those who are seized with the fever.

The causes of fevers, then, are either singular, or universal, or epidemical. The singular proximate causes may be reduced under some heads. 1. The things received into the body being sharp or pricking; whether these things are called *meat, drink, preservatives, or poisons*; provided they are endowed with such properties that they cannot be digested, moved, or evacuated; or when taken in such a quantity as to irritate the stomach, or to choke and obstruct the passages, and putrefy within the body. 2. The things retained in the body which were wont to be evacuated each in their proper way; and these may be retained by means of cold, unctious, vapours, some thick and fat aliment, drink, medicines, poisons, or air. The same effect will also follow from too long continued rest, the omission of some usual exercise, obstructions and compressions either from the contained or surrounding bodies. 3. From action; such as the too great disturbance of mind or body, occasioning heat and tossings. 4. From external, sharp, pungent, tearing, burning, and inflaming applications. 5. From those things which make a considerable change upon the humours and their motions: which may be done by many externals as well as internals; such as hunger, great evacuations, collections of pus, water and watery blood, in dropsies and empyemas; or sharp serum, inflamed and burnt choler, suppurations, gangrenes, too much waking, intense study, and excess of venery.

The effects of fever are, a too quick expulsion and propulsion of the circulating humours, too great an agitation of the stagnating ones, and a mixture of those

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Causes of fever.

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Effects of fever.

those which ought to remain separate; an overcoming and concocting of what refits; a secretion of the concocted matter; and a critical evacuation of what has occasioned the fever by its coagulium and irritation; a change of the found liquors into a diseased state; a change of the found parts into a condition able to bear many things which could not be borne before; an expression of the most thin and liquid juices; a thickening of the remainder; a drought, heat, anxiety, pain, weariness, weakness, heaviness, loss of appetite, and nausea.

The sooner the irritation is allayed and the stagnating liquors resolved, so much the slighter and shorter will be the fever, and the sooner will it tend to health; and so on the contrary: and the fever will also vary according to the different degrees and concurrence of both. Hence we may learn that a fever may often be a medicine instrumental in the cure of other diseases; such as the palsy, &c. Hence the beginnings, full height, declension, crises, changes, and cure of fevers, are various in the very acute fevers, and even in the singular kind.

<sup>109</sup> The cold fit, which happens in the beginning of acute fevers, supposes a smaller attrition of the liquors against each other and their vessels; the lessening of the circular motion; a stagnation of the liquids at the extremities; a less contraction of the heart, a less quantity of the blood forced out of it, and the animal spirits flowing in less quantity from the cerebellum to it. The shaking supposes a wavering of the muscles between their tone and laxness; some causes now extending and soon after relaxing them; and these motions succeeding each other quickly, without the will of the patient, or even against his will; the influx of the arterial and nervous juices, sometimes absent, sometimes present. The cold fit therefore argues, in the beginning of the disease, a rest of both these liquids; towards the end, often too long an absence of the same, after an extravagant expence of the one or both.

<sup>110</sup> The anguish in fevers is occasioned by the blood being stopped in the heart itself, and consequently hindered from passing thro' the lungs and aorta: whence a cramp of the contracted vessels, or an impossibility of the inflamed matter passing through them. The same effect follows from the blood being hindered in its passage through the vena portarum in the liver by the same causes; whence all the venous blood, brought hither by the celiac and mesenteric arteries, cannot return, but stagnates, extends the vessels, resists the approaching blood conveyed through the arteries, and produces all the evils deducible from these causes.

<sup>111</sup> Thirst in fevers owns for its causes a thickness of the liquids, and their inability to flow; a salt, alkaline, or a bilious and oleous acrimony.

<sup>112</sup> Loathing. Another very common symptom in fevers is loathing. The proximate cause of this is a slight convulsion of the muscular fibres of the fauces, gullet, stomach, intestines, and abdominal muscles. Its causes are, 1. A sharp, putrid, bilious matter derived into the empty stomach, rising towards the fauces, pricking and twitching both, whence the other parts follow the same motion; or, 2. A viscid, sluggish, and floating matter, which, by watering those parts, doth also twitch them. 3. A slight inflammation of the stomach, gullet, intestines, and neighbouring viscera,

4. The remembrance of things which, when formerly taken, used to occasion loathings. 5. Lastly, The inordinate motion of the nervous juice, no matter whence arising.

Vomiting, which at first is a violent expulsion and throwing up of the contents of the stomach, and afterwards also of the guts, and lastly of the bowels emptying themselves into the latter, hath, for its proximate cause, a convulsion of the muscular fibres of the fauces, gullet, stomach, intestines, diaphragm, and of the abdominal muscles; and for its remote cause, whatever stimulates these fibres by irritating them or those viscera which are easily convulsed. It happens sometimes, therefore, from a defect of the stomach, which is convulsed, inflamed, impothumated, scirrhous, and cartilaginous, together with an acute fever. It may happen also from a defect of the bowels, and the surrounding parts affected in the same manner, and irritated by the distended stomach full of aliments or other matters; or it may happen from all the causes of very great loathings. Hickups may arise from the same causes.

The weakness in fevers proceeds from the hindrance of the influx and pressure of the nervous juice into the muscles. It may proceed from the emptiness of the vessels, from the liquid being spent, or its being unable to flow; from the obstruction of the canal; or its being pressed and squeezed by an external cause, chiefly about its origin in the brain and cerebellum; and from the weakness of the heart.

Heat in fevers is known outwardly by the thermometer, and the sense or feeling of the patient; but the inward heat, from the redness of the urine. It always argues a greater quantity of fire in that place where the heat is greatest. This again arises from an unusually strong rubbing of the fluid parts among each other, against the vessels, and of the vessels against the liquids. This violence arises from the great motion of the parts pushed from the heart, and from the strong resistance of the vessels against the heart.

The great motion of the blood expelled from the heart is measured by the thickness of it, and by its quick or slow running through the vessels. The degree of thickness is known by inspecting the same when extravasated, from the fast dissipation of the thinnest part, and from the hardness of the pulse. The quickness of its running is computed from the number of the beatings of the heart, compared with the greatness of the pulse beatings. The greatness of the resistance is known from the bulk of sluggish liquors that are to be moved; and from the small number, narrowness, or immobility of the canals which are to let the liquids pass. That the liquids to be moved are too bulky, is known from the signs of a plethora, of a cacochymy, or of a sudden solution of these liquids which just before were stagnating, as it happens in fat people: but this appears most of all to be the case when the veins are much swelled, and at the same time the arteries full and their motions quick. The narrowness of the vessels is understood by feeling, seeing, and knowing, the dry constitution of the patient, whose heat increases greatly upon the least increase of motion. The immobility of the channels, or their unwillingness, as it were, to be dilated, is known by all the signs of stiff fibres, or too great a degree of strength

<sup>113</sup> Vomiting and hickups.

<sup>114</sup> Weakness.

<sup>115</sup> Heat.

THEORY. strength.

From all of these proximate causes may arise the febrile heat; of which again there may be numberless remote causes. But it may arise from the increase of only one of these causes; in which case, the increase of the heat keeps pace with the increase of the cause. If two causes increase together, then will the increased heat be as the products of the increments of those causes when multiplied by each other. The effects of this increase of heat are, to dissipate the most liquid parts of the blood, i. e. the water, spirits, salts, and most subtle oils; it dries the remaining mafs, thickens it, and causes it to run together into an immoveable and irremovable matter; it extricates the salts and oils, attenuates and makes them sharper, exhales and moves them. The consequence of all this is, that the smallest vessels are worn out and broken; the fibres dried, made stiff, and shrivelled; and hence are produced many acute, dangerous, and mortal diseases; which may be easily accounted for and derived from the first effect of heat mentioned here, viz. the dissipation of the thinnest parts of the blood.

118  
Delirium.

A delirium in fevers always supposes a morbid affection of the medullary part of the brain, which may arise from any obstruction whatever, the hindrance of the influx, the transflux, and flowing out of the nervous juice through the substance of the brain; from a violent quick motion, a stagnation, and many other causes, to find out which the physician ought to use all his sagacity and application.

116  
Coma.

A coma, or continual propensity to sleep, sometimes with a real sleep, and often without it, always proceeds from such a state of the brain as hinders the free exercise of the senses and animal-motions. It may arise from a defect of the nervous juice derived to the brain, or from the separation of animal-spirits from the blood into the nerves being obstructed, or from those spirits being denied their free passage to and fro through the nerves. This symptom therefore may be produced by several different, and often contrary, causes; such as all violent and great evacuations or repletions; all the too great thickenings of the blood, whether by glutinous, fat, or inflammatory matters and causes; every thing compressing the brain itself, of whatever nature it may be; and the same causes will produce the same effects, if they act immediately upon the nerves themselves.

117  
Watchfulness.

The opposite evil to the former is a constant and obstinate watchfulness. Its cause is generally the first beginning of the slightest inflammation of the brain; which, if increased, generally turns to a coma.

118  
Convulsions

Convulsions in fevers always proceed from a defect of the brain; which is either affected by some matters conveyed thither through the nerves, and thereby twitched; or they proceed from the unruly arrival, transflux, and issuing forth of the animal-spirits; which may arise from every one of the causes that are able to create a delirium, a coma, or an obstinate watchfulness. If the causes continue long, the evil soon spreads to the whole system of the nerves; whence proceed innumerable mischiefs.

119  
Sweating.

Sweats, in the beginning of an acute fever, arise from a laxity of the extreme capillary vessels, a violent circulation of the blood, and an easy separation of the thin watery part from the others. A continuance of

them deprives the blood of its diluting liquor, thickens the remainder, and occasions mortal obstructions; because the blood afterwards will hardly admit either of being diluted or resolved; whence may be produced almost all the different kinds of acute diseases.

120  
Diarrhea.

A diarrhea or looseness happens pretty frequently in fevers. The matters voided in this case are mucus, lymph, gluten, pus, watery blood, and blood itself; all coming from the nostrils, mouth, fauces, gullet, stomach, liver, gall-bladder, pancreas, the guts themselves, and the mesentery. The causes of their working themselves off in the form of this disease are, such a powerful force as carries them into the intestines, while the contracting force of the intestines is much weakened; or they may arise from impediments in the absorbing vessels of the guts, such as the lacteals hindering the inlets of some of these matters thro' them into the blood. Hence a looseness in fevers is very various as to its causes, effects, and consequences. If it continues long, it disposes the bowels of the lower belly more and more to this disease; it weakens, inflames, and excoriates them; and it drains and dries the other bowels and vessels. Hence a want of nourishment, leanness, weakness, bloody-flux, a thickens of the fluids through the whole habit, a laxity of the solids, a pituitous bloating all over, a dropy, and a consumption.

121  
Pustules.

Inflammatory pustules have generally for their matter, something which cannot pass through the least vessels of the skin, but is forced to stop there; and, for their cause, they acknowledge the circulating, secretory, and excretory, power of life: so that they are manifold according to these different causes, and from thence fevers take their names; as the erysipelatous, scarlet, red, petechial, purple; and variolous or morbillous, from the small-pox and measles.

122  
Intermittent fevers.

The above is Dr Boerhaave's theory of continued fevers. The intermittents, he says, have for their proximate cause a viscosity of the arterial blood, upon which succeeds a too quick and strong contraction of the heart, and after this a resolution of what had been stagnated; which ends the fit.

123  
This theory opposed by Hoffman.

For a long time this theory continued to prevail, and is still adopted by several physicians. It was not, however, without opposition, even during the lifetime of Dr Boerhaave. His opponent was Dr Hoffman, who was also a man of great learning and eminence in his profession. He found fault with Dr Boerhaave for neglecting the nervous system; and asserted, that so far was the body from depending on the state of the fluids, that the crasis of the fluids themselves was entirely dependent on the nervous power; and that a slight alteration in this power was capable of instantaneously changing the blood and all the other humours into fluids of a quite different nature from what they formerly had. He was of opinion therefore, that all, or at least the greatest part of diseases, were affections of the nervous system. This opinion is now so generally diffused and adopted, that Dr Boerhaave's theory is in a manner totally exploded; and as a system of physic built on principles similar to those of Hoffman, hath for some years been taught by Dr Cullen of Edinburgh, we shall give as full an account of it as our limits will admit,

SECT.



## SECT. II. Dr CULLEN's Theory.

THE DOCTOR begins with dividing his theoretical part, or the *Institutions of Medicine*, into three general heads. The first, called *physiology*, treats of that condition of the human body which is necessary to life and health. The second, called *pathology*, delivers the general doctrine of diseases; and the third, called *therapeutics*, delivers the general doctrine concerning the means of prevention and cure.

## I. PHYSIOLOGY.

In treating of this subject, our author first considers the solid matter of which our bodies are composed, and which he calls the *simple solid*. Here he differs remarkably from Dr Boerhaave. The latter, following the doctrines of the chemists, asserted, that the original stamina of the human body are fibres composed of earthy particles cemented together by a kind of glutinous matter. This cementation is denied by Dr Cullen, who very justly observes, that nothing can be deduced from the chemical analysis of these solids, unless we were able to recombine them from the principles to which they are reduced by chemical operations. All that we can know, therefore, with regard to our solid parts, is, that they are formed of water, and a certain matter concreting along with it. The brain is that part of the human body which is first formed; and therefore he is of opinion, that it is the principal or chief organ, upon which the welfare of the body depends. The original stamina of the body he also supposes to be fibrous; and differs from other physiologists, who suppose it totally to consist of cellular texture. This last, he thinks, is superadded to the fibres. How the nutritious matter is applied to the fibres, in order to extend them in length, or to form a cellular texture on their surface, he declares himself unable to explain. "It is probable, however, says he, that for a certain time, at its first beginning, the growth of animal bodies proceeds in the same manner as that of vegetables: but it is evident, that, at a certain period, in the growth of animals, a different economy takes place; and that afterwards the growth seems to depend on an extension of the arteries in length and wideness by the blood propelled into them. It may be supposed that this extension of the arteries is applied to every fibre of the body; and that, by the extension of these, it gives an opportunity for the application and accretion of the nutritious matter, to the growth therefore of the fibre itself, and to the growth of cellular texture on its surface. Perhaps the same extension of the arterial system gives occasion to the secretion of fluids, which, poured into the cellular texture already formed, according to the disposition of these fluids to concrete more or less firmly, gives the different degrees of barenness or density to be observed throughout the body.

"By this extension of the arterial system, the several parts of the body are gradually evolved, some of them sooner, others later, as by the constitution of the original stamina, or after occurrences, they are feebly put into such conditions as render them less exposed to the impetus of the blood, and fitted to receive a greater quantity of it. But as the parts by these causes first evolved will increase the most in the density of their solid parts, they will therefore more and

more resist their former growth; and by the same resistance will determine the blood with more force and in greater quantity into the parts then not so far evolved. Hence the whole system will be at length evolved; and every part of the solids will, in respect of density and resistance, be in balance with every other part, and with the forces to which they are severally exposed.

"The extension of the arteries depends upon the resistances which occur to the free transmission of the blood through them; and further, from a resistance in the veins. For as a considerable portion of the blood does not commonly pass into the smaller branches of the arteries, but must pass very entirely into the veins; so these, by their capacity constantly diminishing as they approach nearer to the heart, and by their coats being of a density and firmness sufficient to prevent further dilatation, considerably resist the free passage of the blood from the arteries into them.

"While these resistances continue, the arteries, and with them almost every fibre of the body, must be extended at every systole of the heart, and with this extension the growth of every part will proceed: but as every part, by its receiving an addition of solid matter, becomes more dense and rigid; so it is less easily extended, and perhaps less readily receives an accretion of new matter than before. Hence it is, that the more the body grows, it admits of any additional growth the more slowly; and unless the extending powers increase in the same proportion with the increasing density of the solids, there must be a period at which these two powers will balance each other, and the growth will proceed no farther. But as it is evident, that the bulk and weight of the heart, and probably therefore its force, does not increase with the increasing bulk of the body, and that the action of the heart is the principal extending power in the system; it is also plain, that the extending power does not extend in the same proportion with the increasing density of the solids; and therefore that these two powers will, at a certain period, come to balance each other.

"But not only is the force of the heart thus constantly diminishing with respect to the resistance of the arteries, but, tho' this force were still subsisting, it has, from other causes, less effect in extending the arteries. The blood is more confined in the arteries, and extends them further in proportion to the resistance of the veins; and this resistance in the veins, and extension of the arteries depending upon it, will be more or less according to the respective density of these two sets of vessels. But it appears from the experiments of Sir Clifton Winttingham, that the density and firmness of the veins with respect to their corresponding arteries is much greater in young animals than in old ones: and thence it appears, that, during the growth of animals, the arteries are acquiring an increase of density in a greater proportion than the veins are at the same time; and therefore that the resistance in the veins with respect to the arteries must be constantly diminishing; that the veins will therefore receive a greater proportion of blood; that in the same proportion the arteries will be less extended; and lastly, that the diminished resistance in the veins concurring with the diminished force of the heart, will

T24  
Of the original stamina of the human body.

T25  
Of the growth of the body.

THEORY. sooner bring the increasing rigidity of the arteries, and therefore of every fibre in the body, to be in balance with the extending powers; at least so far as to prevent their producing any farther growth.

"This account of the change of the resistances in the arteries and veins with respect to one another is agreeable to phenomena which shew that the arteries are larger, and contain more blood in proportion to the veins, in young animals than in old; that arterial hæmorrhages occur most frequently in young persons; and that congestions in the veins with hæmorrhages, or hydropic effusions depending upon them, occur most frequently in old age.

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Death from  
mere old  
age ac-  
counted  
for.

"It is probable, that the resistance both of arteries and veins goes on increasing, while the force of the heart is not increased at the same time; but it appears also, that from the diminishing force of the heart, and the compression which the smaller vessels are exposed to from the distension of the larger, the action of the muscles, and other causes; the number of small vessels, and therefore the capacity of the whole system, is constantly diminishing so much, that the heart may still for some time be sufficient for the circulation of the blood. But while the resistances in the vessels are constantly increasing, the irritability of the moving fibres and the energy of the brain are at the same time constantly diminishing; and therefore the power of the heart must at length become unequal to its task, the circulation must cease, and death ensue.

"The unavoidable death of old persons is thus in part accounted for; but it is, however, still probable, that the same event proceeds chiefly from the decay and total extinction of the excitement or vital power of the nervous system, and that from causes very much independent of the circulation of the blood, and arising in the nervous system itself, in consequence of the progress of life. This seems to be proved by the decay of sense, memory, intellect, and irritability, which constantly takes place as life advances beyond a certain period."

Thus, according to our author, the nervous system is the substratum or fundamental stamina of the whole body; and indeed, as he explains it, our whole frame is so made up of nerves, that the body may be said to contain nothing else. The nervous system he divides into four parts. 1. The medullary substance contained in the cranium and vertebral cavity; the whole of which seems to consist of distinct fibres, but without the several fibres being separated from each other by any evident developing membranes. 2. Connected with one part or other of the above substance are the nerves, in which the same medullary substance is continued; but here more evidently divided into fibres, each of which is separated from the others by an enveloping membrane derived from the pia mater. 3. Parts of the extremities of certain nerves in which the medullary substance is divided of the enveloping membranes from the pia mater, and so situated as to be exposed to the action of certain external bodies, and perhaps so framed as to be affected by the action of certain bodies only. These he calls the *sentient extremities* of the nerves. 4. Certain extremities of the nerves so framed as to be capable of a peculiar contractility, and in consequence of their situation and

attachments to be by their contraction capable of moving most of the solid and fluid parts of the body. These he calls the *moving extremities of the nerves*; they are commonly called *moving or muscular fibres*. The proofs of this last position we shall give in his own words.

"XCI. The inherent power (or contractility of the muscles) is supposed to be more vigorous, moveable, and permanent, in certain muscular fibres than in others.

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Muscles proved to be a part of the nervous system.

"XCII. The inherent power, or the contraction dependent upon it, can be excited by certain applications, made either to the muscles themselves, or to the nerves connected with them; and in either case, the effects of such application are so exactly the same as to allow us to conclude that the matter of the nerves and of the muscular fibres is of the same kind.

"XCIII. The muscular fibres are sensible to various impressions, and are otherwise organs of the sensations of consciousness. From this also it is presumed, that the muscular fibres consist of the same matter which is the subject of sense in other parts of the nervous system.

"XCIV. From (XCII. XCIII.) and other considerations, we think it probable, that the muscular fibres are continuations of the medullary substance of the brain and nerves as before alleged.

"XCV. Though the muscular fibres consist of the same kind of matter as that in the nerves, the latter shew no contractility, because they have not the peculiar organization of the former."

Some physiologists, particularly Dr Haller, have endeavoured to prove, that the muscles have a power of motion independent of that which they receive from the nerves: these our author refutes by some experiments which prove, that both of them continue for an equal length of time, and that when the nerve is irritated, the muscle contracts, even after death, in the same manner as tho' the muscular fibres themselves were irritated.

The Doctor next endeavours to shew, that the force of cohesion and of the muscular fibres are the same. His words are, "As the force of cohesion in the muscular fibres of living animals is much greater than in those of dead ones, it is probable from this and other considerations that the cause of muscular contraction is an increase only of that same power which gives the contractility of the simple solids, and of other inanimate elastica. Haller *Prim. Lin.* 407, 408.

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Power of cohesion the same with muscular power.

"If this is true, it will also explain why the force of cohesion in muscular fibres is greater than that of the medullary fibres in any other part of the nervous system, though both kinds of fibres consist of the same kind of matter." The power abovementioned he conjectures to be an elastic fluid, the motions of which are excited in the nerves, and by their means accumulated in the muscles. The excitement of the fluid in some measure is what is properly called *life*, at least as far as that is corporeal; and its *collapse*, or some diminution of its motion, produces sleep, fainting, &c. or if the collapse is total and irrecoverable, death itself.

With regard to this nervous power, the Doctor absolutely refuses that it is secreted from the blood. "The most common opinion (says he) is, that the brain is a secreted from the blood.

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secretory organ, which secretes a fluid necessary to the functions of the nervous system; that this fluid is alternately exhausted and recruited, and thereby gives occasion to the alternate states of sleeping and waking. But this supposition is attended with many difficulties. 1. It is probable that the nervous fluid existed in the animal embryo before the action of the heart, or any secretory function could take place. 2. In animals which during the winter suffer a temporary death, when, by heat, they are again restored to life, the vital power of the solids is restored before the fluidity of the blood. 3. The nervous fluid subsists in the nerves and muscular fibres long after they are separated from the brain, and often when cut into small parts. 4. Though it be true that the brain is a secretory organ, the fluid may be defined to another purpose; and, so far as we understand that purpose, the fluid fit for it must be unfit for the purposes of sense and motion. 5. There is no appearance, in any part of the nervous system, of provision made for an occasional accumulation of the secreted fluid; nor is there any evidence of its actually taking place. 6. The phenomena of sleep and waking do not correspond with such a supposition; as sleep often takes place when the secreted fluid must be copiously present, and waking can be protracted when the fluid is exhausted much beyond its usual measure. 7. Both states are induced by many causes which can hardly be supposed to act upon a secretion.

"A certain compression of the brain can produce a state of the system resembling sleep; but that state is in some respects different from that of ordinary sleep; and it does not by any means appear, that natural and ordinary sleep depends upon any compression of the brain.

"As it is therefore probable, that sleep and waking do not depend upon a different quantity of the matter of the nervous fluid for the time present in the system, or upon any causes interrupting its motion, while the condition of the matter remains the same, we are disposed to believe, that those states of sleep and waking depend upon the nature of the nervous fluid itself capable of becoming more or less moveable; that it is chiefly in the brain susceptible of these different conditions; and that especially by its condition there, it has its more general effects on the system."

<sup>130</sup> Nutrition conveyed to the body by the nerves. Speaking afterwards of the nutrition of the body, he says, "From the fibrous parts being evidently, in most instances, parts of the nervous system, and from the gradual formation of the fetus, in which the nervous system is first formed, we think it probable, that the whole of the fibres in the different parts of the body are a continuation of the nerves; and this again will lead to the conclusion, that the nourishment of the soft and homogeneous solid every where is conveyed to it by the nerves.

"This supposes also what is otherwise probable, that the cortical part of the brain, or common origin of the nerves, is a secretory organ, in which the gluten of the blood being freed from all saline matter before adhering to it, becomes fit for the nourishment of the solids, and being poured in a sufficiently diluted state upon the organ of the nerves, it is filtrated along the fibres of these; and is thus conveyed to every staminal fibre of the system. We suppose, at the same time,

that the medullary, or what may be called the *solid matter of the nerves*, is, in the living body, constantly accompanied with a subtle elastic fluid, which fits them for being the organs of sense and motion, and which probably is also the means by which the nutritious fluid is carried on in the substance of the nerves from their origin to their extremities.

By this system the blood and its circulation, instead of being the principal or vital function, as it was reckoned by Harvey and others, becomes so much a secondary in the animal economy, that it answers little other purpose besides the nutrition of the body. It hath been objected, however, that this fluid is, some how or other, of the utmost consequence; since a stoppage of the circulation, or a wound in the large vessels about the heart, proves instant death, without waiting for any consumption of the body by reason of its want of nourishment. This our author explains large blood-<sup>131</sup> why sudden death happens from wounding the large blood-vessels, by reminding us, that the vessels must necessarily be in a certain state of distension, in order to the mobility of the nervous fluid. The evacuation of all the blood causes an irretrievable collapse of the vessels, and consequently of the nervous fluid, upon which death immediately takes place.

We apprehend it would be superfluous here to enter into any particular disquisition concerning the manner in which each of the functions of the animal economy are performed. These may be seen under their proper articles as they occur in the order of the alphabet, and what we have already taken notice of will be sufficient to make his theory of diseases quite intelligible.

## II. PATHOLOGY.

From the sketch we have given of Dr Cullen's physiology, it may easily be imagined, that the distinguishing characteristic of his pathology will be, that almost all diseases are the consequences of an affection of the nervous system. The nervous power, he thinks, is the same with what Hippocrates called *Nature*, and to which he ascribed such efficacy in removing diseases. This subject, however, the latter did not prosecute to any good purpose, and his followers still less. Erasistratus took no notice of it; and though Galen ascribed an active power to what he called *Nature*, yet he considered this as chiefly concerned in the support of health and the cure of diseases, and referred the operations of nature in the cure of diseases to the solids and fluids. In the 15th and 16th centuries the restorers of physic for a long time overlooked the nervous power; and though the chemists introduced their doctrines with regard to the fluids, yet they acquiesced in the former doctrine which ascribed to them the ultimate powers of the animal economy. Van Helmont indeed proposed a very considerable change by his doctrine of the *archæus*; maintaining, that the motion of it had a greater share in the production of diseases than the causes assigned by the chemists and Galenists. But this doctrine was delivered in such an obscure and fanciful manner, that no notice was taken of it; and people continued to imagine that diseases consisted in a certain *intemperies* of the fluids, and that *fever* particularly consisted in a preternatural heat. After the discovery of the circulation, Sylvius de la Boe asserted, that fever proceeded from an increased velocity of the blood, and that an increased



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quickness of the pulse was its pathognomonic. This, however, we are not to admit as true, because then the cure of fevers would consist only in diminishing the velocity of the blood, which is very easily done; yet sometimes it is necessary to increase this velocity in order to cure the fever. To this doctrine Bellini and Boerhaave added the doctrine of acrimony and a *lentor* or viscosity in the blood; and this theory, such as we have laid down above from the aphorisms of Boerhaave, continued to be followed till very lately. Hoffman considers fevers as entirely consisting in a change of the state of motion in the muscular fibres; which undoubtedly depends on that of the nervous system. The particular cause is a *spasm* in the extreme arteries; and the cure consists in a relaxation of that spasm, without regarding the fluids, but only so far as they affect the nervous system.

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Account of  
the phenomena of  
fevers.

The following are the general phenomena of fevers as laid down by Dr Cullen. The person is affected first with a languor, or sense of debility, inactivity, and sluggishness. The face and extremities become pale; the features shrink; the bulk of every external part is diminished, and the skin all over the body appears constricted as if by cold. A coldness of the extremities may now be perceived by another person, though the patient himself takes little or no notice of it. At length the cold becomes also perceptible to him; first, commonly, in his back, and thence passing over the whole body; though now his skin frequently feels warm to another person. The sense of cold continually increases, and at length produces a tremor in all the limbs, with frequent luccussions or rigors of the trunk of the body. When this sense of cold and its effects have continued for some time, they become less violent, and alternate with warm flushings. By degrees the cold goes off entirely, and a heat greater than in a natural state prevails all over the body. With this heat the colour of the skin returns; and a preternatural redness appears, especially in the face. With the heat and redness the skin is relaxed and smoothed, but for some time it continues dry. The features of the face, and other parts of the body, recover their usual size, and even become more turgid. When the heat, redness, and turgescence, have increased and continued for some time, a moisture appears upon the face, which by degrees becomes a sweat, and at length prevails over the whole body. As this sweat continues to flow, the heat of the body abates; the sweat, after continuing some time, gradually ceases; the body returns to its usual temperature, and most of the functions are restored to their ordinary state.

From these general appearances, the paroxysm may be divided into three different stages, viz. the *cold*, the *hot*, and the *sweating* stages or fits; in each of which a considerable change happens to several of the functions.

On the first approach of languor, the pulse sometimes become slower, and always weaker, than before; and as the sense of cold comes on, it becomes smaller, very frequent, and often irregular. As the cold wears off and the heat comes on, the pulse becomes more regular, hard, and full; and in these respects increases till the sweat breaks out. As the sweat flows, the pulse becomes softer and less frequent, until, the sweat ceasing altogether, it returns to its usual state. The

respiration during the cold stage is small, frequent, and anxious; as the hot stage comes on, it becomes fuller, and more free; but is still frequent and anxious, till the flowing of the sweat relieves the anxiety, and renders the breathing less frequent. On the approach of the cold stage, the appetite ceases, and does not return till either the paroxysm is at an end, or the sweat has flowed for some time. Generally, however, during the whole paroxysm, there is not only a want of appetite, but an aversion from all solid food, especially of the animal kind. As the cold stage advances, nausea and vomiting frequently come on, with the discharge of a matter for the most part bilious; but when the hot stage is pretty well advanced, this sickness abates, and commonly goes off altogether when the sweat breaks out. A considerable degree of thirst is commonly felt during the whole course of the paroxysm. In the cold stage, it seems to arise from the dryness and clamminess of the mouth and fauces; and during the hot stage, from the heat which then prevails; but, as the sweat flows, the mouth becomes more moist; and the thirst, together with the heat, gradually abates.

In the course of the paroxysm, a considerable change is also made in the state of the secretions. The circumstances already mentioned shew it with regard to the saliva, and it is still more remarkable with regard to the urine. In the cold stage, the urine is almost colourless and without cloud or sediment. In the hot stage it becomes high coloured, but is still without sediment. After the sweat has flowed freely, the urine deposits a sediment commonly lateritious, and continues to do so for some time after the paroxysm is over. Stools seldom occur till towards the end of a paroxysm, except in certain uncommon cases which are attended throughout with a diarrhoea.

It frequently happens also that tumours, subsisting on the surface of the body, suffer, during the cold stage of fevers, a considerable diminution of their bulk; but which returns, though not always, during the sweating stage. In like manner, ulcers are sometimes dried up during the cold stage, and return again to discharge matter during the sweating stage, or after the paroxysm is over.

During the cold stage, the sensibility is often greatly impaired; but when the hot stage comes on, the sensibility is recovered, and often considerably increased. When the cold stage comes on, the attention and recollection become difficult; and continue so, more or less, during the whole paroxysm. Hence some confusion of thought takes place, and often arises to a delirium; which sometimes comes on at the beginning of the cold stage, but more frequently not till the hot stage is formed. With the cold stage also comes on a kind of drowsiness or stupor, which sometimes increases to such a degree that the patient becomes comatose, and almost apoplectic. In this stage also a head-ach sometimes comes on: but more commonly this is not felt till the hot stage is formed; and then it is usually attended with a throbbing of the temples. The head-ach continues till the sweat breaks out; but as this flows more freely, that gradually wears off. At the same time there are commonly pains of the back, and some of the great joints; which are to be derived from the same causes with the head-ach.

These are the principal phenomena to be observed

in the paroxysm of a fever; but it is very seldom that the disease is terminated by a single paroxysm such as hath been already described. It more generally happens, that after the series of phenomena above-mentioned, and after the patient has been for a certain length of time free from them, the same series of phenomena begins again to arise, and to observe the same course as before; and these states of fever and apyrexia often continue to alternate with each other for a great number of times. In these cases, the length of time from the end of one paroxysm to the beginning of another is called an *INTERMISSION*; and the length of time from the beginning of one paroxysm to the beginning of another is called an *INTERVAL*.

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Of different  
kinds of  
fevers.

When the disease consists of a number of paroxysms, it is generally to be observed that the intervals between them are nearly equal; but these intervals are of different lengths in different cases. The most usual interval is that of 48 hours; which is named the *TERNIAN* Period. The next most common is that of 72 hours, and is named the *QUARTAN* Period. An interval of 24 hours is called the *QUOTIDIAN* Period. This last is not unfrequent: but all intervals longer than the quartan are extremely rare, and probably only irregularities of the tertian or quartan periods.

The paroxysms of pure intermittent fevers are always finished in less than 24 hours. But it frequently happens that there are fevers which consist of repeated paroxysms without any entire intermission between them: yet in such cases it is observed, that though the hot and sweating stages of the paroxysms do not entirely cease before the 24 hours from their beginning have expired, they suffer, however, before that time, a considerable abatement or *REMISSION* of their violence; and at the return of the quotidian period, a paroxysm is in some shape renewed, and runs the same course as before. This constitutes what is called a *REMITTENT FEVER*. In many cases, however, this remission is not considerable, and perhaps takes place without sweat; the returning paroxysm is not marked by the usual symptoms of a cold stage, but is chiefly known by the aggravation or *exacerbation* of a hot stage; in which cases the disease is called a *CONTINUED FEVER*. In some cases the remissions and exacerbations are so inconsiderable, that they are not easily observed or distinguished; and this has led physicians to imagine that there is a species of fever subsisting for several days together, and seemingly consisting of one paroxysm only. This they have called a *CONTINENT* fever; but Dr Cullen assures us, that, in a long course of practice, he had no opportunity of observing such a fever.

With respect to the form or type of fevers, it may be observed, that the quartan, while it has the longest interval, has at the same time the longest and most violent cold stage; but, upon the whole, the shortest paroxysm: the tertian, having a shorter interval than the quartan, has, at the same time, a shorter and less violent cold stage; but a longer paroxysm; and, lastly, that the quotidian, with the shortest interval, has the least of a cold stage; but the longest paroxysm. The type of fevers is sometimes changed in their course. When this happens, it is generally in the following manner: Both tertians and quartans change into quotidians; quotidians into remittents; and these last become often of the most continued kind; and in all these

cases the fever has its paroxysms protracted longer than usual, before it changes into a type of more frequent repetition.

From all this the Doctor concludes, that every fever consists of repeated paroxysms, and differs from others only in the circumstances and repetition of the paroxysms; and therefore that it was allowable to take the paroxysm of a pure intermittent as an example and model of the whole.

The phenomena of fevers being thus enumerated, Of the Doctor next proceeds to explain their causes. The proximate cause, he says, has hitherto eluded the researches of physicians; but as the hot stage is so constantly preceded by a cold one, he presumes that the cold stage is the *cause* of the hot one, and consequently that the cause of the cold stage is the cause of all that follows in the course of the paroxysm. The cold stage, he observes, is always preceded by evident marks of a general debility prevailing in the system. The smallness and weakness of the pulse, the paleness and coldness of the extreme parts, with the shrinking of the whole body, sufficiently shew that the action of the heart and larger arteries is for the time extremely weakened. At the same time the languor, inactivity, and debility of the animal motions, the imperfect sensations, the feeling of cold while the body is truly warm, and some other symptoms, all shew that the energy of the brain itself is on this occasion greatly weakened; and as this weakness of the action of the heart can hardly be attributed to any other cause, it is also a proof of the diminished energy of the brain.—Another proof of the existence of debility is, that when the paroxysms of a fever have ceased to be repeated, they may be again renewed; and are most commonly renewed by the application of debilitating powers.

Hence, says our author, it is evident that there are three states which always take place in fever, viz. a state of debility, a state of cold, and a state of heat; and as these three states regularly succeed each other in the order above-mentioned, it is to be presumed that they are in the series of cause and effect with regard to one another.—The hot stage, he thinks, is an effect of the *vis medicatrix nature* so famous in the schools of physic, and it is probable that many symptoms of diseases are owing to the same cause. To this cause he also inclines to attribute some of the symptoms of the cold stage; but is obliged to refer them to a law which he says exists in the animal economy, whereby those powers which have a tendency to hurt and destroy the system, often excite such motions as are suited to obviate the effects of the noxious power. That some part of the cold stage is owing to the *vis medicatrix*, he thinks further probable, because the cold stage appears universally to be a means of producing the hot; because cold, externally applied, has very often similar effects; and especially because it seems to be in proportion to the degree of tremor in the cold stage that the hot one proceeds more or less quickly to a termination of the paroxysm, and to a more complete solution and longer intermission.

In the time of the cold stage, there seems to be a *spasm* induced every-where on the extremities of the arteries, particularly of those upon the surface of the body. This appears from the suppression of all the

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The idea of fever then may be, that a spasm of the extreme vessels, however induced, may prove an irritation to the heart and arteries; and that this continues till the spasm is relaxed and overcome. Still, however, it will remain a question what is the cause of this spasm; whether it be directly produced by the remote causes of fever, or if it is only a part of the vis medicatrix nature. The doctor is inclined to the latter opinion; first, because it is certain that debility lays the foundation of fever: secondly, because supposing this uncertain, we can more easily perceive how debility induces spasm, than how spasm produces debility, which always more or less appears: and thirdly, because we perceive that the degree of spasm formed, and the obstinacy of its continuance, depend, in many cases, upon the power of the causes inducing debility, and upon the debility induced; for the more powerful the debilitating causes, and the greater the debility produced, the paroxysms are the longer, and the more frequently repeated.—From hence, says he, we are led to believe, that, together with the *spasm*, there is an *atony* subsisting in the extreme vessels, and that the relaxation of the spasm requires the restoring of the tone and action of these.

This may be illustrated from considering the symptoms which take place with respect to the functions of the stomach in fevers; such as the anorexia, nausea, and vomiting. The connection, or consent, which we observe between the perspiration and the appetite in healthy persons, renders it probable, that the tone of the extreme vessels on the surface of the body, and that of the muscular fibres of the stomach, are connected or consenting with each other; and that therefore in fevers the want of appetite or of tone in the muscular fibres of the stomach may depend upon the atony of the extreme vessels on the surface of the body.—A further proof that in fevers the fibres of the stomach are affected with an atony, is the nausea and vomiting which so frequently occur, and which so commonly depend upon a debility of the stomach.—That the debility of the stomach which produces vomiting depends upon an atony of the extreme vessels on the surface of the body appears particularly from an observation of Sydenham. In the attack of the plague, a vomiting happens, which prevents any medicine from remaining upon the stomach; and Dr Sydenham tells us, that he could not overcome this vomiting but by external means, applied to produce a sweat or determination to the surface of the body.

The connection between the state of the stomach and that of the extreme vessels on the surface of the body appears from this also, that the vomiting, which so frequently happens in the cold stage of fevers, commonly ceases upon the coming on of the hot, and

very certainly upon any sweats coming out. It is indeed probable, that the vomiting in the cold stage of fevers, is one of the means employed by nature for restoring the determination to the surface of the body; and it is a circumstance affording a proof, both of this and of the general connection between the stomach and surface of the body, that emetics thrown into the stomach and operating there in the time of the cold stage, commonly put an end to it, and bring on the hot stage. It also affords a proof of the same connection, that cold water taken into the stomach produces an increase of heat on the surface of body, and is very often a convenient and effectual means of producing sweat.

We draw a proof of the same connection from this also, that cold applied to the surface of the body, when it does not stop perspiration, is always a powerful means of exciting appetite. It may also be considered, whether the fever which so constantly accompanies the digestion of food in the stomach be not induced by filling the stomach, by relaxing its muscular fibres, and thereby inducing an atony of the extreme vessels.

The Doctor acknowledges a difficulty in explaining how an atony and spasm can subsist at the same time in the same vessels: but considers it as a matter of fact which cannot be denied; and at the same time thinks it may be found analogous to what happens upon other occasions in the system, where we often observe atony producing spasm.—This atony is supposed to depend upon a diminution of the energy of the brain; and that this diminution takes place in fevers, he concludes, not only from the debility prevailing in so many of the functions of the body as already mentioned, but from the symptoms peculiar to the brain itself.

Delirium is common in fever: and this symptom commonly depends on some inequality in the excitement of the brain, or intellectual organ; and hence it may be concluded, that, in fever, it denotes some diminution in the energy of the brain. Delirium indeed seems often to depend on an increased impetus of the blood in the vessels of the brain; and therefore attends phrenitis. It frequently appears also in the hot stage of fevers, accompanied with a head-ach and throbbing of the temples. But, as the impetus of the blood in the vessels of the head is often considerably increased, by exercise, external heat, passions, and other causes, without occasioning any delirium; it must be supposed, that the same impetus, in the case of fever, produces delirium; for this reason only, that at the same time there is some cause which diminishes the energy of the brain, and prevents a free communication between the parts concerned in the intellectual functions. Upon the same principles also he supposes that there is another species of delirium which depends more entirely on the diminished energy of the brain; and may therefore arise when there is no unusual increase of the impetus of the blood in the vessels of the brain. Such seems to be the delirium occurring at the beginning of the cold stage of fevers, or in the hot stage of such fevers as shew strong marks of debility in the whole system.

“Upon the whole then, (says he), our doctrine of fever is explicitly this:—The remote causes of fever



are certain sedative powers applied to the nervous system, which, diminishing the energy of the brain, thereby produce a debility in the whole of the functions, and particularly in the action of the extreme vessels. Such, however, is at the same time the nature of the animal economy, that this debility proves an indirect stimulus to the sanguiferous system; whence, by the intervention of the cold stage and spasm connected with it, the action of the heart and larger arteries is increased, and continues so till it has had the effect of restoring the energy of the brain, of extending this energy to the extreme vessels, of restoring therefore their action, and thereby especially overcoming the spasm affecting them; upon the removing of which, the excretion of sweat, and other marks of the relaxation of excretories, take place."

The Doctor next proceeds to take notice of some mistakes concerning the nature of fever.—It has been supposed, that a lentor or viscosity prevailing in the mafs of blood, and stagnating in the extreme vessels, is the cause of the cold stage of fevers and its consequences. But there is no evidence of any such viscosity previously subsisting in the fluids; and as it is very improbable that such a state of them can be suddenly produced, the suddenness with which paroxysms come on, renders it more likely that the phenomena depend upon some cause acting on the nervous system, or the primary moving powers of the animal economy.

Another opinion, which has been very universally received, is, that a noxious matter introduced into, or generated in the body, is the proximate cause of fever; and that the increased action of the heart and arteries, which makes so great a part of the disease, is an effect of the *vis medicatrix nature* to expel this morbid matter, and particularly to change and concoct it, so as to render it altogether innocent, or at least fit for being more easily thrown out of the body. This doctrine, however, though of as great antiquity as any in the records of physic, and received into every school of medicine, he nevertheless considers as exceedingly erroneous. Fevers are produced by cold, fear, and other causes, with all the essential circumstances belonging to the disease, and terminating by sweat, without any evidence or suspicion of morbid matter. There have been fevers suddenly cured by an hæmorrhage so moderate as cannot carry out any considerable portion of a matter diffused over the whole mass of blood; nor can we conceive how the morbid matter could be collected or determined to pass off by such an outlet as in that case is opened. Even supposing a morbid matter were present, there is no explanation given in what manner the concoction of it is performed; nor is it shewn that any such change does in fact take place. In certain cases it is indeed evident, that a noxious matter is introduced into the body, and proves the cause of fever. But even in these cases it appears, that the noxious matter is thrown out again, without having suffered any change: that the fever often terminates before the matter is expelled: and that, upon many occasions, without waiting the supposed time of concoction, the fever can be cured; and by remedies which do not seem to operate upon the fluids, or to produce any evacuation.

But though he thus reasons against the notion of fevers being an effort of nature for concocting and expelling a morbid matter, the Doctor by no means denies that the cause of fever frequently operates upon the fluids, and particularly produces a putrescent state of them. This he acknowledges is frequently the case: but at the same time he maintains, that such a change of the fluids is not commonly the cause of fever; that very often it is only an effect; and that there is no reason for believing the termination of the fever to depend upon the expulsion of the putrid matter.

Another opinion with regard to intermittent fevers remains still to be mentioned. In these fevers a great quantity of bile is commonly thrown out by vomiting; and this is so frequently the case, that many have supposed an unusual quantity of bile, and perhaps a peculiar quality of it, to be the cause of intermittent fevers.—This, however, does not appear to be well-founded. Vomiting, by whatever means excited, if often repeated, with violent straining, seems to be powerful in emulging the biliary ducts, and commonly throws out a great deal of bile. This will happen especially in the case of intermittent fevers. For as, in the state of debility and cold stage of these fevers, the blood is not propelled in the usual quantity into the extreme vessels, and particularly into those on the surface of the body; but is accumulated in the vessels of the internal parts, and particularly in the *vena portarum*; so this may occasion a more copious secretion of bile. The circumstance, however, which chiefly occasions the appearance of bile in these cases is, the influence of warm climates and seasons. These seldom fail to produce a state of the human body, in which the bile is disposed to pass off by its secretories in greater quantity than usual, and perhaps also changed in its quality; as appears from the disease of the cholera, which so frequently occurs in warm seasons. This disease, however, occurs often without fever: and there are very strong reasons for supposing that intermittent fevers for the most part arise from another cause, viz. marsh effluvia; while at the same time there is no evidence of their arising from the state of the bile alone. The marsh effluvia, however, commonly operate in the same season that produces the change of the bile; and therefore, considering the vomiting and other circumstances of the intermittent fevers which here concur, it is not surprising that autumnal intermittents are so often attended with effusions of bile.

The Doctor now proceeds to consider the difference of fever, and its causes. With other physicians, he supposes, that in every fever there is a power applied to the body which has a tendency to hurt and destroy it, and produces certain motions in it which deviate from the natural state: and, at the same time, in every fever which has its full course, he supposes, that, in consequence of the constitution of the animal economy, there are certain motions excited which have a tendency to obviate the effects of the noxious power, or to correct and remove it. Both these kinds of motions he considers as constituting the disease. The latter, which are of salutary tendency, and considered as the operations of the *vis medicatrix nature*, he calls the RE-ACTION of the system.

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From the above doctrine it appears, that, in fever, the circumstances of debility, spasm, and re-action, are chiefly to be considered; and therefore, according as these are different in degree, and different in proportion to one another, they will exhibit the chief differences of fevers.

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paroxysms  
at certain  
intervals.

Every fever of more than one day's duration, consists of repeated paroxysms; and in those in which the paroxysms are distinctly observed, it is constantly to be remarked, that every paroxysm is finished in less than 24 hours: but as we cannot perceive any thing in the cause of fevers determining to this, we must suppose it to depend on some general law of the animal œconomy. Such a law seems to be that which subjects the œconomy, in many respects, to a diurnal revolution. The cause of this is uncertain; but the returns of sleep and watching, of appetites and excretions, and the changes which regularly occur in the state of the pulse, shew sufficiently that in the human body a diurnal revolution takes place. That the paroxysms are connected with that revolution appears from this, that though the intervals of paroxysms are different in different cases, the times of the accession of the paroxysms are generally fixed to one time of the day; so that quotidians come on in the morning, tertians at noon, and quartans in the afternoon. It is still, however, to be remarked, that as quartans and tertians are apt to become quotidians, these to pass into the state of remittents, and these to become continued; and that, even in the continued form, daily exacerbations and remissions are generally to be observed: all this shews so much the power of diurnal revolution, that when, in certain cases, the daily exacerbations and remissions are with difficulty distinguished, we may still presume that the general tendency of the œconomy prevails; that the disease still consists of repeated paroxysms; and, on the whole, that there is no such disease as hath been commonly called a *continued fever*.

The repetition of the paroxysms depends on the circumstances belonging to them when already formed. The longer these paroxysms are protracted, the sooner they are repeated; and therefore we are to conclude, that the cause of the frequent repetition is to be sought for in the cause of the protraction of the paroxysms. The duration of the whole paroxysm chiefly depends upon that of the hot stage, in which the reaction is operating to take off the spasm formed in the cold stage. We may therefore suspect that the longer duration of the hot stage is owing either to the obliquity of the spasm, or to the weakness of the reaction; and it is probable, that sometimes the one and sometimes the other of these circumstances takes place.

The degree of spasm which takes place in fevers, may be supposed different, according to the degree of irritability in each particular person; and therefore the reaction in fever being given, the paroxysm, or continuance of the hot stage, may be longer or shorter, according to the degree of spasm that has been formed. One of the causes of the obliquity of spasm is, that in inflammatory diseases there is a *diathesis phlogistica* prevailing in the body, and this diathesis is supposed by the Doctor to consist in an increased tone of the whole arterial system. When therefore this diathesis accompanies fever, as it sometimes does, it may be sup-

posed to give occasion to the febrile spasms being formed more strongly, and thereby to produce more protracted paroxysms. Accordingly we find, that all inflammatory fevers are of the continued kind, and that all the causes of the diathesis phlogistica have a tendency to change intermittent into continued fevers. As continued fevers, therefore, are in many cases attended with the diathesis phlogistica, our author thence concludes, that this is the cause of their continued form. In many fevers, however, there is no evidence of any diathesis phlogistica being present, or any evidence of more considerable spasm; and in such fevers we must impute the protraction of the paroxysms, and the continued form of the fever, to the weakness of reaction. That this cause takes place, may be concluded from hence, that in many cases of fever wherein the separate paroxysms are the most protracted, and the most difficultly observed, we find the most considerable symptoms of a general debility; and therefore it may be concluded, that in such cases the protracted paroxysms and continued form depend upon a weaker reaction, owing either to the causes of debility applied having been of a more powerful kind, or to circumstances of the patient's constitution favouring their operation.

From the view just now given of the causes of the protraction of paroxysms, and therefore of the form of continued fevers strictly so called, it seems probable, that the remote causes of these operate by occasioning either a phlogistic diathesis, or a weaker reaction; for we can observe, that the most obvious difference of continued fevers depends upon the prevailing of one or other of these states.

With regard to the remote causes of fever, as this has been considered as consisting chiefly in an increased action of the heart and arteries, physicians have supposed, that certain direct stimulants, fitted to produce this increased action, are the remote causes of fever. In many cases, however, there is no evidence of such stimulants being applied: and in the cases in which they are applied, they either produce only a temporary frequency of pulse, which cannot be considered as a disease; or, if they do produce a permanent febrile state, it is by the intervention of a topical inflammation, which produces a disease different from what is strictly called a *fever*.

That direct stimulants are the remote causes of fever seems farther improbable, because the supposition does not account for the phenomena attending the accession of fevers, and because other remote causes can with greater certainty be assigned. As fevers are so generally epidemic, it is probable, that some matter floating in the atmosphere, and applied to the bodies of men, ought to be considered as the remote cause of fevers. These matters being present in the atmosphere, and acting upon men, may be considered either as *Miasmata*, or as *Contagions*.

Miasmata may arise from various sources, and be of different kinds; but we know little of their variety or of their several effects. We know with certainty only one species of miasma which can be considered as the cause of fever; and from the universality of this it may be doubted whether there be any other. The miasma so universally the cause of fever, is that which arises from marshes or moist ground acted upon by heat. So many observations have now been made with respect

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THEORY. to this, in so many different regions of the earth, that there is neither any doubt of its being in general a cause of fevers, nor of its being very universally the cause of intermittent fevers in all their different forms. The similarity of the climate, season, and soil, in which intermittents arise, and the similarity of the diseases arising in different regions, concur in proving that there is one common cause of these diseases, and that this is the marsh miasma. What is the particular nature of this miasma we know not; nor do we certainly know whether it differs in kind or not: but it is probable that it does not; and that it differs only in the degree of its power, or perhaps in its quantity, in a given space.

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Of conta-  
gions.

Of contagions, a great variety have been supposed to exist; but this seems to be asserted without sufficient evidence. The number of genera and species of contagious diseases, of the class of pyrexia, at present known, is not very great. Whether there are any belonging to the order of phlegmasia, is doubtful; and though it should be supposed, it will not much increase the number of contagious pyrexia: and as each of the contagious diseases hath been found always to retain the same character, and to differ only in circumstances, which may be imputed to season, climate, and other external causes, or to the peculiar constitution of the persons affected, it may thence be concluded, that in each of these species the contagion is of one specific nature; and that there is one principal, perhaps one common, source of such contagions.

It is now well known, that the effluvia arising from the living human body, if long confined in the same place, without being diffused in the atmosphere, acquire a singular virulence; and, in that state, applied to the bodies of men, become the cause of a fever which is very contagious. The late observations on jail and hospital fevers have fully proved the existence of such a cause; and it is sufficiently obvious, that the same virulent matter may be produced in many other places. At the same time the nature of the fevers arising renders it probable, that the virulent state of human effluvia is the common cause of such fevers, as they differ only in a state of their symptoms; which may be imputed to the circumstances of season, climate, &c. concurring with the contagion, and modifying its force.

With respect to these contagions, though they are spoken of above as a matter floating in the atmosphere, it is proper to observe, that they are never found to act but when they are near to the sources from whence they arise; that is, either near to the bodies of men from which they immediately issue, or near to some substances which, as having been near to the bodies of men, are imbued with their effluvia, and in which substances these effluvia are sometimes retained in an active state for a very long time. The substances thus imbued with an active matter may be called *fomites*; and the Doctor thinks it probable, that contagions, as they arise from fomites, are more powerful than as they arise immediately from the human body. But though it is probable that fevers generally arise from marsh or human effluvia, we cannot with any certainty exclude some other remote causes which are commonly supposed to have a share in producing them. The first of these causes to be taken notice of is, the

operation of cold on the human body.

This acts so differently in different circumstances, that it is difficult to give a satisfactory explanation of it. In certain circumstances cold has manifestly a sedative power. It can extinguish the vital principle cold.

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Of the ope-  
ration of

entirely, either in particular parts, or through the whole body; and, considering how much the vital principle of animals depends upon heat, it cannot be doubted that the power of cold is always more or less directly sedative. But it is equally manifest, that, in certain circumstances, cold proves a stimulus to the living body, and particularly to the sanguiferous system. Besides the sedative and stimulant powers of cold, it is also manifestly a powerful astringent; causing a contraction of the vessels on the surface of the body, and thereby producing paleness and a suppression of perspiration. It is likewise probable, that this constriction is in some measure communicated to the whole body, and that thereby the application of cold proves a tonic with respect to the whole system.

These several effects of cold do not all take place at the same time, but may be variously combined. The stimulant power taking place, obviates the effects that might otherwise have arisen from the sedative, and in some measure from those of the astringent power. But the stimulant and tonic powers of cold are commonly conjoined, and the former perhaps depend in part upon the latter.

In what circumstances these different effects of cold take place, is difficult to determine; but the morbid effects may be observed to be chiefly of four kinds. One is a general inflammatory diathesis of the system; which is commonly accompanied with rheumatism, or other phlegmasia. A second is a catarrhal affection; a third is a gangrene; and a fourth is a proper fever. In producing this last, the operation of cold generally concurs with that of marsh or human effluvia. In all its operations, cold seems to act more powerfully, in proportion as the body, and particularly the vigour of the circulation, is previously more weakened.

Besides cold, there are other powers which seem to be the remote causes of fevers; as fear, intemperance in drinking, excess in venery, and other causes, which evidently weaken the system. But, whether any of these sedative powers be alone the remote cause of fever, or if they only concur with the operation of marsh or human effluvia, or if they give an opportunity to the positive operations of cold, are questions not to be answered with certainty.

The causes of death in fevers are either direct or indirect. The first are those which directly attack and destroy the vital principle as lodged in the nervous system, or destroy the organs immediately connected with it. The second, or the indirect causes of death, are those which interrupt such functions as are necessary to the due continuance and support of the vital principle.

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Of the  
causes of  
death in  
fevers.

Of these general causes those which operate more particularly in fevers seem to be, first the violence of reaction, which, either by repeated violent excitements destroys the vital power itself, or by its violence destroys the organization of the brain necessary to the action of the vital principle, or by the same violence destroys the organization of the parts more immediately necessary to the circulation of the blood.



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Secondly, the cause of death in fevers may be a poison, that is, a power capable of destroying the vital principle; and this poison may be either the miasma or contagion which was the remote cause of the fever, or it may be a putrid matter generated in the course of the fever. In both cases, the operation of such a power appears either as acting chiefly on the nervous system, inducing the symptoms of debility; or, as acting upon the mass of blood, inducing a putrescent state in it, and in the fluids derived from it.

From all this the symptoms shewing the tendency to death in fevers may be discovered, by their being either the symptoms of violent reaction, of great debility, or of a strong tendency to putrefaction in the fluids.

The symptoms which denote the violence of reaction, are, 1. The increased force, frequency, and hardness of the pulse. 2. The increased heat of the body. 3. Those symptoms which are the general marks of an inflammatory diathesis; and more especially those of a particular determination to the brain, lungs, or other important viscera. 4. Those which are the marks of the cause of violent reaction; that is, of a strong spasm appearing in the suppression of the excretions.

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Symptoms  
denoting  
great debility.

The symptoms which denote a great degree of debility are,—in the animal-functions, 1. The weakness of the voluntary motions. 2. The irregularity of the voluntary motions depending on their debility. 3. The weakness of sensation. 4. The weakness and irregularity of the intellectual operations.—In the vital functions, 1. The weakness of the pulse. 2. The coldness or shrinking of the extremities. 3. The tendency to a deliquium animi in an erect posture. 4. The weakness of respiration.—In the natural-functions, 1. The weakness of the stomach, as appearing in anorexia, nausea, and vomiting. 2. Involuntary excretions, depending upon a palsy of the sphincters. 3. Difficult deglutition, depending upon a palsy of the muscles of the fauces.—The symptoms denoting a putrescent state of the fluids, are, 1. In the stomach, the loathing of animal food, nausea, and vomiting, great thirst, and a desire of acids. 2. In the mass of blood, an unusual fluidity, so that when drawn out of the veins it does not coagulate as usual; hæmorrhagy from different parts, without marks of increased impetus; effusions under the skin or cuticle, forming petechiæ, maculæ, and vibices, and effusions of a yellow serum under the cuticle. 3. In the state of excretions, frequent, loose, and fetid stools; high-coloured turbid urine; fetid sweats; and the fetor of blisters. 4. The cadaverous smell of the whole body.

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Denoting  
a putrescent  
state of the  
fluids.

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Of critical  
days.

Many physicians have been of opinion that there is something in the nature of fevers which generally determines them to be of a certain duration; and, therefore, that their terminations, whether in health or in death, happen at certain periods of the disease rather than at others. These periods are called the CRITICAL DAYS. These were carefully observed by Hippocrates and the ancients, but have been denied by many to take place in the fevers of these northern regions. Dr Cullen, however, is of opinion, that the doctrine of the ancients, and particularly that of Hippocrates, on this subject, was well founded; and that it is just and true even with respect to the fevers of our

climate. For this opinion he gives the following reasons: 1. Because the animal œconomy is readily subjected to periodical movements, both from its own constitution, and from habits which are readily produced in it. 2. Because periodical movements take place in the diseases of the human body with great constancy and exactness, as in the case of intermittent fevers, and many other diseases.

The critical days, or those on which the termination of continued fevers is supposed to happen, are, the *third, fifth, seventh, ninth, eleventh, fourteenth, seventeenth, and twentieth*. We mark none beyond this last; because though fevers are sometimes protracted beyond this period, the instances are but rare, and we have not a sufficient number of observations to ascertain the course of them; and likewise because it is probable, that in fevers long protracted the movements become less exact and regular, and are therefore less easily observed. This appears from the facts laid down by Hippocrates: as, in 163 cases of fevers, no fewer than 107, or more than two thirds of the whole number, terminated on one or other of the eight days above-mentioned; none terminated on the second or thirteenth; and upon the eighth, tenth, twelfth, fifteenth, sixteenth, eighteenth, and nineteenth, there are but 18 terminations, or one-ninth of the whole. But though it must be acknowledged that it is the general tendency of the animal-œconomy to determine the periodical movements in fevers to be chiefly on critical days, it must also be acknowledged that in many cases the regular course of it may be disturbed by particular circumstances. Thus, though the chief and more remarkable exacerbations in continued fevers happen on the critical days, there are truly exacerbations happening every day; and these, from certain causes, may become considerable and critical.

What determines the periods to be changed about the 11th day, hath not been well understood. But the fact is certain: for there is no instance of any termination on the 13th; but on the 14th, 17th, and 20th, there are 43 instances of termination, and only six on all the intermediate days between these. Hippocrates indeed makes mention of many terminations happening on the 4th day; but, from its inconsistency with the general tendency, and some other considerations, Dr Cullen is led to think that the terminations on this day are to be looked upon only as irregularities.

The opinions of those modern physicians who refuse the prevalence of critical days, he thinks, are to be little regarded. The observation of the course of continued fevers is difficult and fallacious; and therefore the regulating of that course may have escaped inattentive and prejudiced observers. His own observations amount to this: That fevers with moderate symptoms, generally cases of the synocha, frequently terminate in nine days or sooner, and very constantly on one or other of the critical days which fall within that period: but it is very rare in this climate, that cases of either the typhus or synochus terminate before the 11th day; and when they do terminate on this day, it is most commonly fatal. When protracted beyond this period, their termination hath been very constantly observed on the 14th, 17th, or 20th day.

In such cases, the salutary terminations are seldom attended with any considerable evacuation. A sweat-  
ing

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Of crises.

ing frequently appears, but is seldom considerable; and critical and decisive terminations have been hardly ever observed attended with vomiting, evacuations by stool, or remarkable changes in the urine. The solution of the disease is chiefly to be discerned from some return of sleep and appetite, the ceasing of the delirium, and an abatement of the frequency of the pulse. By these symptoms we can often mark a crisis of the disease; but it seldom happens suddenly and entirely, and it is most commonly from some favourable symptoms on one critical day that we can announce a more entire solution on the next following.

Having thus given a pretty full account of the Doctor's general theory of fevers, we now proceed to take notice of his doctrine of inflammation.

When any part of the surface of the body is affected with unusual redness, heat, pain, and tumour, we name the disease an *inflammation* or *phlegmasia*. These symptoms of inflammation are never very considerable, without the whole system being at the same time affected with *pyrexia*. The internal parts are subject to inflammation as well as the external; and we judge them to be inflamed, when, together with pyrexia, there is a fixed pain in any internal part, attended with some interruption in the exercise of its functions. We judge of the presence of inflammation also from the state of the blood drawn from the veins. When the blood, after cooling and concretion, shews a portion of the gluten separated from the rest of the mass, and lying on the surface of the crassamentum; as such separation happens in all cases of more evident phlegmasia, so in ambiguous cases, we, from this appearance, joined with other symptoms, conclude the presence of inflammation. At the same time it must be observed, that as several circumstances in blood-letting may prevent this separation of gluten from taking place in blood otherwise disposed to it, so we cannot always conclude, from the want of such appearance, against the presence of inflammation.

The phenomena of inflammation all concur in shewing, that there is an increased impetus of the blood in the vessels of the part affected; and as at the same time the action of the heart is not always considerably increased, Dr Cullen supposes that the increased impetus of the blood in the particular part is owing especially to the increased action of the vessels of the part itself. The cause of this increased action is therefore to be inquired after, and is the proximate cause of inflammation. In many cases we can manifestly perceive, that inflammation arises from the application of stimulant substances to the part. When the application of stimulants therefore is evident, we seek for no other cause of inflammation; but as, in many cases, such application is neither evident, nor (with any probability) to be supposed, we must in such cases seek for some other cause of the increased impetus of the blood in the vessels of the part.

Many physicians have supposed, that an obstruction of the extreme vessels, any-how produced, may prove a cause of inflammation: but many difficulties attend this doctrine.

1. The supposition of an *ERROR LOCI* is not at all probable. For the motion of the blood in the extreme vessels is so weak and slow, as readily to admit a

retrograde course of it: and therefore, if a particle of blood should happen to enter a vessel whose branches will not allow its passage, it will be moved backwards till it meet with a vessel fit for transmitting it; and the frequent ramifications and anastomoses of the extreme arteries are very favourable to this.

2. The supposition of a preternatural lentor or viscosity of the blood, is not well-founded; for it is probable, that nature has specially provided against a state of the fluids so incompatible with the exercise of the most important functions of the animal œconomy. While motion continues to prevent any separation of parts, and heat continues to preserve the fluidity of the more viscid, there seems to be always so large a quantity of water present, as to give a sufficient fluidity to the whole.

3. The Doctor supposes that no general lentor ever does take place; because, if it did, it must shew more considerable effects than commonly appear.

4. There are no experiments directly in proof of a preternatural lentor prevailing in the mass of blood; nor is there any evidence of certain parts of the blood occasionally acquiring a greater density and force of cohesion than ordinary; neither is there any proof of the denser or more coherent parts being present in the mass of blood in such greater proportion than usual, as to occasion a dangerous spissitude. The experiments of Dr Browne Langrish on this subject afford no conclusion, having been made on certain parts of the blood separated from the rest, without attending to the circumstances of blood-letting, which very much alter the state of the separation and concretion of the blood drawn out of the veins.

5. In the particular case of inflammation, there are several circumstances which render it probable that the blood is then more fluid than usual.

6. Though an obstruction should be supposed to take place, it will not be sufficient for producing the effects appearing in inflammation. An obstruction of one vessel does not, as has been imagined, increase the velocity of the blood in the neighbouring vessels which are free; and in fact it appears, from many observations and experiments, that considerable obstructions may be formed, and may subsist, without producing the symptoms of inflammation.

Obstruction, therefore, is not to be considered as the cause of inflammation; but, at the same time, it is probable, that some degree of obstruction does take place in every inflammation. The distension, pain, redness, and tumour, attending inflammation, are only to be explained by supposing, that the extremities of the arteries do not readily transmit the unusual quantity of blood impelled into them by the increased action in the course of those vessels. Such an obstruction may be supposed to happen in every case of an increased impetus of the blood; but it is probable, that, in the case of inflammation, there is also a preternatural resistance to the free passage of the fluids.

From the doctrine of fever we are led to believe, that an increased action of the heart and arteries is not supported for any length of time by any other means than a spasm affecting the extreme vessels: and that the same spasm takes place in inflammation,

Inflammation generally accompanied with spasm.

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seems probable from hence, that every considerable inflammation is introduced by a cold stage, and is accompanied with that and the other circumstances of pyrexia; and it seems also probable, that something analogous to this occurs even in the case of those inflammations which seem less considerable and to be purely topical.

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Inflammation particularly explained.

From all this, the nature of inflammation may be explained in the following manner. Some causes of inequality in the distribution of the blood may throw an unusual quantity of it upon particular vessels, to which it must necessarily prove a stimulus. But, further, it is probable, that, to relieve the congestion, the *vis medicatrix nature* increases still more the action of these vessels, which it effects by the formation of a spasm on their extremities, as in all other febrile diseases. A spasm, therefore, of the extreme arteries, supporting an increased action in the course of them, may be considered as the proximate cause of inflammation, at least in all cases not arising from direct stimuli applied. That this is the case, seems probable from the consideration of rheumatism. This is a species of inflammation which is often manifestly produced, either by cold applied to over-distended vessels, or by causes of an increased impetus and over-distension in vessels previously constricted. Hence the disease especially appears at seasons liable to frequent and considerable vicissitudes of heat and cold. To this we may add, that the parts of the body most frequently affected with inflammation, are those exposed both to over-distension from a change in the distribution of the fluids, and at the same time to the immediate action of cold. Hence quinies and pneumatic inflammations are more frequent than any others.

That a spasm of the extreme vessels takes place in inflammation is further to be presumed from what is at the same time the state of the whole arterial system. In every considerable inflammation, though arising in one part only, an affection is communicated to the whole system; in consequence of which, an inflammation is readily produced in other parts besides that first affected. This general affection is well known to physicians under the name of the *DIATHESIS PHLOGISTICA*. It appears most commonly in persons of the most rigid fibres; is often manifestly induced by the tonic or astrigent powers of cold; is increased by all tonic and stimulant powers applied to the body; is always attended with a hardness of the pulse; and is most effectually taken off by the relaxing powers of blood-letting. From these circumstances it seems probable, that the *diathesis phlogistica* consists in an increased tone, or contractility, and perhaps *contraction*, of the muscular fibres of the whole arterial system. Such a state of the system presumes a spasm of the extreme vessels, and the general state commonly arises from that begun in a particular part; tho' it be also probable, that the general state may arise and subsist for some time without the obvious inflammation of any particular parts.

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Inflammations may be terminated by resolution.

If an inflammation is cured while the state and texture of the part remain entire, the disease is said to terminate by *resolution*. This happens when the previous congestion and spasm have been in a moderate degree, and the increased impetus of the blood has been sufficient to overcome the spasm, to dilate the

vessels, and to remove the congestion, so that the part is restored to its ordinary and healthy state. A resolution takes place also when the increased impetus of the fluids has produced an increased exhalation into the adjoining cellular texture, or an increased excretion in some neighbouring part, and has thereby relieved the congestion in the vessels, and relaxed the spasm of the inflamed part. Lastly, a resolution may take place, when the increased impetus of the blood in the whole system occasions such an evacuation, as, tho' in a distant part, may prove sufficient to take off the phlogistic diathesis of the whole system, and thereby relieve the congestion and spasm of the particular part affected by inflammation.

The tumour which appears in inflammation may be imputed in part to the congestion of fluids in the vessels; but is owing chiefly to an effusion of matter into the adjoining cellular texture; and accordingly tumours seldom appear but in parts adjoining to a lax cellular texture. If, in this case, the matter effused be only a larger quantity of the ordinary exhalent fluid, this, when the free circulation in the vessels is restored, will be readily absorbed, and the state of the part will become the same as before: but, if the increased impetus of the blood in an inflamed part dilate the exhalent vessels to such a degree that they pour out an entire serum, this will not so readily be re-absorbed; and, from the experiments of Sir John Pringle and Mr Gaber we learn, that under stagnation the serum may undergo a particular change, by having the gluten present it in changed into a white, opaque, moderately viscid, mild liquor, which we name *PUS*. When this change happens in the inflamed part, as it is at the same time attended with an abatement of the redness, heat, and pain, which formerly distinguished the disease, it is said to be terminated by *SUPPURATION*; and an inflamed part containing a collection of pus, is called an *ABSCESS*. In inflammation, the tendency of it to suppuration may be discovered by the continuance of the inflammation, without the symptoms of resolution; by some remission of the pain of distension; and by the pain being of a throbbing kind, more distinctly connected with the pulsation of the arteries; by the pulse of the arteries being fuller and softer; and often by the patient's being afflicted frequently with cold shiverings. This happens at no determinate period; and when the tendency is determined, the time necessary to a complete suppuration is different in different cases. When pus is completely formed, the pain formerly in the part entirely ceases, and a weight is felt in it. If the collection is formed immediately under the skin, the tumour becomes pointed, the part becomes soft, and the fluctuation of the fluid within can be commonly perceived; and, at the same time, the redness of the skin, which formerly prevailed, is entirely gone.

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By suppuration.

In abscesses, while the pus is formed of one part of the matter which has been effused, the other and thinner parts are re-absorbed; so that in the abscess, when opened, pus alone appears. This pus, however, is not the converted gluten alone: for the conversion of this being the effect of a particular fermentation, which may affect the solid substance of the part, and perhaps every solid of animal-bodies; so it most readily and particularly affects the cellular texture,



ture, and thereby a great deal of this is eroded, and forms a part of the pus; and it generally happens also, that some of the smaller red vessels are eroded, and some red blood appears mixed with the pus in abscesses. Hence we may see how an abscess, when formed, may either spread into the cellular texture of the neighbouring parts, or, by eroding the incumbent teguments, be poured out upon the surface of the body, and produce an open ulcer.

The matter of abscesses, and of the ulcers following them, is various, according to the nature of what is effused, and which may be,

1. A matter thinner than serum. 2. An entire and pure serum. 3. A quantity of red globules. 4. A matter furnished by particular glands seated in the part. Of these, the second only affords a proper pus, the effusion of which, whether in abscesses or ulcers, seems to be the peculiar effect of an inflammatory state of the vessels; and from this cause it is, that, when ulcers do not produce a proper pus, we in many instances bring them to a state of suppuration, by the application of stimulants exciting inflammation, such as balsams, mercury, copper, &c.

When the matter effused into the cellular texture of an inflamed part is tainted with a putrid ferment, this produces, in the effused matter, a change approaching more or less to a complete putrefaction. When this is in a moderate degree, and affects only the fluids effused, with the substance of the cellular texture, the part is said to be affected with a *GANGRENE*; but if the putrefaction affect also the vessels and muscles of the part, the disease is said to be a *SPHACELUS*.

A gangrene may arise from a putrid ferment acting on the matter which is most commonly effused, and likewise from that matter being peculiarly disposed to putrefaction; as particularly seems to be the case of the red globules of blood effused in a large quantity. In a third manner also, a gangrene seems frequently to arise from the violent excitement of the inflammation destroying the tone of the vessels; whereby the whole fluids stagnate and run into putrefaction, which taking place in any degree destroys further the tone of the vessels, and spreads the gangrene.

A tendency to gangrene may be apprehended from an extreme violence of pain and heat in the inflamed part, and from a great degree of pyrexia attending the inflammation. The actual coming on of it is perceived by a change of colour in the part from a clear to a dark red; by blisters arising upon it; by its becoming soft, flaccid, and insensible; and by the ceasing of all pain while these appearances take place. As the gangrene proceeds, the colour of the part becomes livid, and, by degrees, quite black, the heat entirely ceases, the softness and flaccidity of the part increases; it loses its consistence, acquires a cadaverous smell, and may then be considered as affected with a sphacelus.

The schools of physic have commonly reckoned a fourth way in which inflammation may terminate, viz. by a *scirrhus*, or an indolent hardness of the part. This, however, according to Dr Cullen, is a rare occurrence; and seems not to depend so much upon the nature of inflammation, as upon the circumstances of

the part affected. Scirrhus is chiefly observed in glandular parts, and is owing to the parts readily admitting a stagnation of the fluids.

Besides these there are the following ways, not commonly taken notice of, in which inflammations terminate. One is, by the effusion of a portion of the entire mass of blood, either by means of rupture or anastomosis, into the adjoining cellular texture. This happens especially in inflammations of the lungs, where the effused matter, by compressing the vessels, and stopping the circulation, occasions a fatal suffocation; and this is perhaps the manner in which the peripneumony most commonly proves fatal.—Another kind of termination is that of certain inflammations on the surface of the skin, when there is poured out under the cuticle a fluid too gross to pass through its pores; and which therefore separates it from the skin, and raises it up into the form of a vesicle containing the effused fluid.—A third way is, when the internal viscera are inflamed, there appears almost always upon their surface an exsudation, which appears partly in a viscid concretion upon their surface, and partly in a thin serous fluid effused into the cavities in which the inflamed viscera are placed. Though these appearances very constantly accompany those inflammations which have proved fatal, it is however probable, that like circumstances may attend those inflammations terminated by resolution, and may contribute to the event, as there are instances of a pneumonic inflammation terminating in an hydrothorax.

The remote causes of inflammation may be reduced to four heads. 1. The application of stimulant substances, among which are to be reckoned the action of fire, or burning. 2. External violence operating mechanically in wounding, bruising, or overstretching the parts. 3. Extraneous substances lodged in any part of the body, though they be neither of an acrid quality, nor of a pointed form. 4. Cold, in a certain degree, not sufficient immediately to produce gangrene.

We cannot perceive, that in different cases of inflammation there is any difference in the state of the proximate cause except in the degree; and though some difference of inflammation may arise from the difference of its remote causes, this is not necessary to be taken notice of here; because the different appearances which attend different inflammations may be referred for the most part to the difference of the part affected, as will appear when we consider the several genera and species of diseases in the Nosology.

### SECT. III. *Abstract of Dr GREGORY'S Theory.*

In his *Conspectus Medicinæ Theoreticæ*, published at Edinburgh in 1780, the Doctor\* begins with observing, that some functions of the human body relate to itself only, and others to external things. To the latter class belong those which by physicians are called the *animal functions*; such as sense, and voluntary motion: to the former, those named *vital functions*, because, without them, life could not subsist but a very short time; such as the action of the brain and nerves, the circulation of the blood, and respiration.

By reason of the constant waste of the solids, and evapo-

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evaporation of the fluid parts of the body, we stand in need of nourishment, which supplies this waste; after which the putrid and excrementitious parts are thrown out by the proper passages. The digestion of the food, secretion of the humours, and excretion of the putrid parts of the food, are called the *natural functions*; which, though necessary to life, may be interrupted for a considerable time without danger.

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Diseases  
simple and  
compound.

A *disease* takes place, when the body hath so far declined from a sound state, that its functions are either quite impeded, or performed with difficulty. A disease therefore may happen to any part of the body either solid or fluid, or to any one of the functions; and those may occur either single, or several of them joined together; whence the distinction of diseases into *simple and compound*.

We have examples of the most simple kinds of diseases, in the rupture or other injury of any of the corporal organs, by which means they become less fit for performing their offices; or, though the organs themselves should remain sound, if the solid or fluids have degenerated from a healthy state; or if, having lost their proper qualities, they have acquired others of a different, perhaps of a noxious nature; or lastly, if the moving powers shall become too weak or too strong, or direct their force in a way contrary to what nature requires.

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Symptoms

Diseases of this kind, however, occur so rarely, that they may rather be accounted *imaginary* than otherwise; for the most simple diseases are either productive of others, or of *symptoms*, by which alone they become known to us.—Every thing in which a sick person is observed to differ from one in health is called a *symptom*; and the most remarkable of these symptoms, and which most constantly appear, define and constitute the disease.

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Causes  
predispos-  
ing and  
exciting.

The causes of diseases are various; often obscure, and sometimes totally unknown. The most full and perfect proximate cause is that which, when present, produces a disease, when taken away removes it, and when changed also changes it.—There are also remote causes, which physicians have been accustomed to divide into the *predisposing* and *exciting* ones. The former are those which only render the body fit for a disease, or which put it into such a state that it will readily receive one. The exciting cause is that which immediately produces the disease in a body already disposed to receive it.

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Proximate  
cause.

The predisposing cause is always inherent in the body itself, though perhaps it originally came from without; but the exciting cause may either come from within or from without.

From a junction of the predisposing and exciting causes comes the *proximate* cause, which neither of the two taken singly is able to produce; seeing neither every exciting cause will produce a disease in every person, nor will every one predisposed to a disease fall into it without an exciting cause.—A body predisposed to disease therefore hath already declined somewhat from a state of perfect health, although none of its functions are impeded in such a manner that we can truly say the person is diseased. Yet sometimes the predisposing cause, by continuing long, may arrive at such an height, that it alone, without the addition of any exciting cause, may pro-

duce a real disease.—Of this we have examples in the debility of the simple solids, the mobility of the living solids, and in plethora.—The exciting cause also, though it should not be able immediately to bring on a disease; yet if it continues long, will by degrees destroy the strongest constitution, and render it liable to various diseases; because it either produces a predisposing cause, or is converted into it, so that the same thing may sometimes be an exciting cause, sometimes a predisposing one; of which the inclemencies of the weather, sloth, luxury, &c. are examples.

Diseases, however, seem undoubtedly to have their <sup>163</sup> *When* origin from the very constitution of the animal machine; and hence many diseases are common to every body when a proper exciting cause occurs, though some people are much more liable to certain diseases than others. Some are hereditary; for as healthy parents naturally produce healthy children, so diseased parents as naturally produce a diseased offspring. Some of these diseases appear in the earliest infancy; others occur equally at all ages; nor are there wanting some which lurk unsuspected even to the latest old age, at last breaking out with the utmost violence on a proper occasion. Some diseases are born with us, even though they have no proper foundation in our constitution, as when a fetus receives some hurt by an injury done to the mother; while others, neither born with us, nor having any foundation in the constitution, are sucked in with the nurse's milk. Many diseases accompany the different stages of life; and hence some are proper to infancy, youth, and old age. Some also are proper to each of the sexes; especially the weaker sex, proceeding, no doubt, from the general constitution of the body, but particularly from the state of the parts subservient to generation. Hence the diseases peculiar to virgins, to menstruating women, to women with child, to lying-in women, to nurses, and to old women. The climate itself, under which people live, produces some diseases; and every climate hath a tendency to produce a particular disease, either from its excess of heat or cold, or from the mutability of the weather. An immense number of diseases also may be produced by impure air, or such as is loaded with putrid, marshy, and other noxious vapours. The same thing may happen also from corrupted aliment, whether meat or drink; though even the best and most nutritious aliment will hurt if taken in too great quantity; not to mention poisons, which are endowed with such pernicious qualities, that even when taken in a very small quantity they produce the most grievous diseases, or perhaps even death itself. Lastly, from innumerable accidents and dangers to which mankind are exposed, they frequently come off with broken limbs, wounds, and contusions, sometimes quite incurable; and these misfortunes, though proceeding from an external cause at first, often terminate in internal diseases.

Hitherto we have mentioned only the dangers which come from without; but those are not less, nor fewer in number, which come from within. At every breath, man pours forth a deadly poison both to himself and others. Neither are the effluvia of the lungs alone hurtful: there flows out from every pore of the body a most subtle and poisonous matter, perhaps of a putrescent

scient nature, which being long accumulated, and not allowed to diffuse itself through the air, infects the body with most grievous diseases; nor doth it stop here, but produces a contagion which spreads devastation far and wide among mankind. From too much or too little exercise of our animal-powers also no small danger ensues. By inactivity either of body or mind, the vigour of both is impaired; nor is the danger much less from too great employment. By moderate use, all the faculties of the mind, as well as all the parts of the body, are improved and strengthened; and here nature hath appointed certain limits, so that exercise can neither be too much neglected, nor too much increased, with impunity. Hence those who use violent exercise, as well as those who spend their time in sloth and idleness, are equally liable to diseases; but each to diseases of a different kind: and hence also the bad effects of too great or too little employment of the mental powers.

Besides the dangers arising from those actions of the body and mind which are in our own power, there are others arising from those which are quite involuntary. Thus, passions of the mind, either when carried to too great excess, or when long continued, equally destroy the health; nay, will even sometimes bring on sudden death. Sleep also, which is of the greatest service in restoring the exhausted strength of the body, proves noxious either by its too great or too little quantity. In the most healthy body, also, many things always require to be evacuated. The retention of these is hurtful, as well as too profuse an evacuation, or the excretion of those things either spontaneously or artificially which nature directs to be retained. As the solid parts sometimes become flabby, soft, almost dissolved, and unfit for their proper offices, so the fluids are sometimes inspissated, and formed even into the hardest solid masses. Hence impeded actions of the organs, vehement pain, various and grievous diseases. Lastly, some animals are to be reckoned among the causes of diseases; namely, such as support their life at the expence of others: and these either invade us from without, or take up their residence within the body, gnawing the bowels while the person is yet alive, not only with great danger and distress to the patient, but sometimes even death itself.

Man, however, is not left without defence against so many and so great dangers. The human body is possessed of a most wonderful power, by which it preserves itself from diseases, keeps off many, and in a very short time cures some already begun, while others are by the same means more slowly brought to a happy conclusion. This power, called the *autocratie*, or *vis medicatrix nature*, well known both to physicians and philosophers, by whom it is most justly celebrated; this alone is sufficient for curing many diseases, and is of service in all. Nay, even the best medicines operate only by exciting and properly directing this force; for no medicine will act on a dead carcase. But though physicians justly put confidence in this power, and though it generally cures diseases of a slighter nature, it is not to be thought that those of the more grievous kind are to be left to the unassisted efforts of the *vis medicatrix*. Physicians therefore have a twofold error to avoid, namely, either despising the powers of nature too much, or putting too great confidence in

them; because in many diseases these efforts are either too feeble or too violent, inasmuch that sometimes they are more to be dreaded than even the disease itself. So far therefore is it from being the duty of a physician always to follow the footsteps of nature, that it is often necessary for him to take a directly contrary course, and oppose her efforts with all his might.

In his second chapter, Dr Gregory tells us, that the animal solid, when chemically examined, yields earth, oil, salt, water, phlogiston, and a great quantity of mephitic air. These elements are found in various proportions in the different parts of the body; and hence these parts are endowed with very different mechanical powers, from the hardest and most solid bone, to the soft and almost fluid retina. Nay, it is principally in this difference of proportion between the quantities of the different elements, that the difference between the solid and fluid parts of the animal consist, the former having much more earth and less water in their composition than the latter. The cohesion, he thinks, is owing to something like a chemical attraction of the elements for one another; and its cause is neither to be sought for in the gluten, fixed air, nor earth. This attraction, however, is not so strong, but that even during life the body tends to dissolution; and immediately after death putrefaction commences, provided only there be as much moisture in it as will allow an intestine motion to go on. The greater the heat, the sooner does putrefaction take place, and with the greater rapidity doth it proceed; the mephitic air flies off, and together with it certain saline particles; after which, the cohesion of the body being totally destroyed, the whole falls into a putrid colluvies, of which at length all the volatile parts being dissipated, nothing but the earth is left behind.

This analysis, he owns, is far from being perfect; because nobody hath ever been able, by combining the chemical principles of flesh, to reproduce a compound any thing like what the flesh originally was: but, however imperfect the analysis may be, it still hath the advantage of showing in some measure the nature and causes of certain diseases, and thus leads physicians to the knowledge of proper remedies.

The solid parts are fitted for the purposes of life in three several ways; namely, by their cohesion, their flexibility, and their elasticity, all of which are various in the various parts of the body. Most of the functions of life consist in various motions. In some the most violent and powerful motions are required; and therefore such a degree of cohesion is necessary in these parts as will be sufficient for allowing them to perform their offices without any danger of laceration. It is therefore necessary that some of the solid parts should be more flexible than others; and it is likewise necessary that these parts, along with their flexibility should have a power of recovering their former shape and situation, after the removal of the force by which they were altered.

These variations in flexibility, within certain limits, seldom produce any material consequence with regard to the health: though sometimes, by exceeding the proper bounds, they may bring on real and very dangerous diseases; and this either by an excess or diminution of their cohesion, flexibility, or elasticity. By augmenting the cohesion, the elasticity is also for the

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Of the chemical analysis of the animal solids.

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Of the cohesion, flexibility, and elasticity of the solids.



the most part augmented, but the flexibility diminished; by diminishing the cohesion, the flexibility becomes greater, but the elasticity is diminished.

The causes of these affections, though various, may be reduced to the following heads. Either the chemical composition of the matter itself is changed; or, the composition remaining the same, the particles of the solid may be so disposed, that they shall more or less strongly attract one another. As to the composition, almost all the elements may exist in the body in an undue proportion, and thus each contribute its share to the general disorder. But of many of these things we know very little; only it is apparent, that the fluid parts, which consist chiefly of water, and the solid, which are made up of various elements, are often in very different proportions: the more water, the less is the cohesion or elasticity, but the greater the flexibility; and the reverse, if the solid or earthy part predominates.

The remote causes of these different states, whether predisponent or exciting, are very various. In the first place, idiosyncrasy itself, or the innate constitution of the body, contributes very much to produce the above-mentioned effects. Some have naturally a much harder and drier temperament of the body than others; men, for instance, more than women; which can with the utmost difficulty, indeed scarce by any means whatever, admit of an alteration. The same thing takes place at different periods of life; for, from first to last, the human body becomes always drier and more rigid. Much also depends on the diet made use, which always produces a corresponding state of the solids, in proportion to its being more or less watery. Neither are there wanting the most weighty reasons for believing, that not only the habit of the body, but even the disposition of the mind, depends very much on the diet we make use of. The good or bad concoction of the aliment also, the application of the nourishment prepared from it, and likewise the state of the air with regard to moisture or dryness, affect the temperament of the body not a little; and hence those who inhabit mountainous or dry countries, are very different from the inhabitants of low marshy places. Lastly, the manner of living contributes somewhat to this effect: Exercise presses out and exhales the moisture of the body, if in too great quantity; on the contrary, sloth and laziness produce an effect directly opposite, and cause a redundancy of humours.

But, putting the chemical composition of the solid parts out of the question altogether, they may be affected by many other causes. The condensation, for instance, or compression of the particles, whether by mechanical causes, or by means of cold or heat, makes a considerable alteration in the strength and elasticity of every solid body. How much mechanical pressure contributes to this may be understood from the experiments of Clifton Winttingham: and hence also are we to deduce the reason of many facts of the highest importance in the animal-economy; namely, the growth, state, decrease, of the body; its rigidity daily increasing; and at last the unavoidable death incident to old age from a continuance of the same causes.

Perhaps the different density of the solids is in some measure owing to Nature herself; but it seems rather to depend more on the powers of exercise or inactivity in

changing the state of the solids, the effects of which on the body, whether good or bad, may hence be easily understood.

Heat relaxes and expands all bodies, but cold renders them more dense and hard; the effects of which on the human body are well known to most people. Though the body is found to preserve a certain degree of heat almost in every situation, it is impossible but that its surface must be affected by the temperature of the ambient atmosphere, and we have not the least reason to doubt that every part of the body may thus feel the effects of that temperature. What a difference there is between one who, exposed to the south-wind, becomes lazy and languid, scarce able to drag along his limbs; and one who feels the force of the cold north-wind, which renders the whole body alert, strong, and fit for action.

That these various causes, each of which is capable of affecting the constitution of the body when taken singly, will produce much greater effects when combined, is sufficiently evident. The experiments of Bryan Robinson, the effects of the warm bath, and indeed daily experience, shew it fully.

It is not yet certainly known what is the ultimate structure of the minutest parts of the animal-solid; whether it consists of straight fibres or threads, whose length is very considerable in proportion to their breadth, variously interwoven with one another, as Boerhaave supposes; or of spiral ones, admirably convoluted and interwoven with one another, as some microscopical experiments seem to shew; or whether the cellular texture is formed of fibres and *laminae*, and from thence the greatest part of the body, as the celebrated Haller hath endeavoured to prove.

The cellular texture is observed throughout the whole body: it surrounds and connects the fibres themselves, which are sufficiently apparent in many of the organs; and slightly joins the different parts which ought to have any kind of motion upon the neighbouring ones. By a condensation of the same substance also, the strongest, and what seem the thinnest, membranes are formed; the most simple of which, being accurately examined, discover the cellular structure. This cellular substance sometimes increases to a surprising degree, and all parts formed of it, membranes, vessels, &c. especially by a gentle distension; for a sudden and violent distension either breaks it altogether, or renders it thinner. Sometimes also it grows between neighbouring parts, and joins those which nature hath left free. Preternatural concretions of this kind are often observed after an inflammation of the lungs or of the abdominal viscera; and these new membranes are found to be truly cellular. This substance, when cut, or by any other means divided, grows together of its own accord; but if, by reason of very great inflammation and suppuration, a large portion of the cellular texture hath been destroyed, it is never again renewed, and an ugly scar is left. It is even said, that this substance, in certain cases, is capable of joining the parts either of the same body with one another, or of a foreign body with them; and upon this, if on any foundation, rests the art of *Taliacutus*, and that of transplanting teeth, lately so much talked of.

The cellular texture is in some places merely a kind of

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Of the structure of the solid animal solids.

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The cellular texture.

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Of the fat.

great bulk or compression would have been inconvenient or dangerous, as in the head, lungs, eyes, eyebrows, penis, scrotum, &c. there it collects no fat, but is lax, and purely reticulated; but between the muscles of the body and limbs below the skin, in the abdomen, especially in the omentum and about the kidneys, very much fat is secreted and collected. The fat is a pure animal-oil, not very different from the expreffed and mild vegetable ones; during life it is fluid, but of different degrees of thickness in different parts of the body. It is secreted from the blood, and is often suddenly reabsorbed into it, though pure oil is very rarely observed in the blood. It is indeed very probable, that oil, by digestion, partly in the *primæ viæ*, and partly in the lungs, is converted into gluten, and this again into oil by means of secretion; though no organs secreting the fat can be shewn by anatomists. It is, however, probable that there are such organs; and that the cellular texture has some peculiar structure in those parts which are destined to contain the fat already secreted, without suffering it to pass into other places; for it never passes into those parts which are purely reticulated, although the cellular texture is easily permeable by air or water over the whole body from head to foot.

The fat is augmented by the use of much animal-food, or of any other that is oily and nourishing, provided the digestion is good; by the use of strong drinks, especially malt-liquor; by much rest of body and mind, much sleep and inactivity, castration, cold, repeated bloodletting, and in general by whatever diminishes the vital and animal powers. Much, however, depends on the constitution of the body itself; nor is it possible to fatten a human creature at pleasure like an ox. A certain degree of fatness, according to the age of the person, is a sign and effect of good health; but when too great, it becomes a disease of itself, and the cause of other diseases. It may always be very certainly removed by strong exercise, little sleep, and a spare and solid diet. The fat always makes up a considerable part of the bulk of the body, and very often by far the greatest part. Its use seems to be to make the motion of the body more easy and free by lessening the friction of the moving parts, and thus preventing the abrasion of the solids, which would otherwise happen. It is also of use to hinder the parts from growing together, which sometimes happens when, by an ulcer or any other accident, a part of the cellular texture containing the fat is destroyed. Besides all this, the fat contributes not a little to the beauty of the body, by filling up the large interstices between the muscles, which would otherwise give the person a deformed and shocking appearance. It is thought to be nutritious, when absorbed from its cells by the blood; but of this we have no great certainty. It seems to have some power of defending from the cold, seeing nature hath bestowed it in very great quantity on those animals which inhabit the colder regions.

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The vital  
solids.

Those parts of the body which enjoy sense and mobility, are called *living* or *vital* solids. They are the brain, cerebellum, medulla oblongata, spinal marrow, the nerves arising from these and diffused throughout the whole body, and which are distributed through the

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various organs of sense and through the muscles, and lastly the muscles themselves. Sensation is much more general than mobility, as being common to all the parts already mentioned. Mobility is proper to the muscular fibres alone; wherever there is sensation, therefore, we may believe that there are nerves; and wherever there is mobility, we may believe that muscular fibres exist. Nay, even mobility itself seems to originate from the connection which the muscles have with the nerves: for soon after the nerves are compressed, or tied, or cut, the muscles to which they are distributed lose their faculties; which happens, too, when the brain itself, or the origin of the nerves, is affected. Some reckon that the muscles are produced from the nerves, and consist of the same kind of matter. Both indeed have a similar structure, as being fibrous and of a white colour: for the muscles when well freed from the blood, of which they contain a great abundance, are of this colour as well as the nerves; neither can the nervous fibres by any means be distinguished from the muscular fibres themselves. Both have also sensation; and both stimulants and sedatives act in the same manner, whether they be applied to the muscles themselves, or to the nerves.

It is difficult for us to discover the origin of many parts of the body, or to ascertain whether they are produced all at the same time, or one after another: yet it must be owned, that many of the muscular parts are observed to have attained a remarkable degree of strength, while the brain is still soft and almost fluid; and that the action of these muscular parts is required for the action and growth of the brain. The muscles are also of a much firmer contexture than the nerves; and enjoy a power of their own, namely, that of irritability, of which the nerves never participate. Of necessity, therefore, either the muscles must be constructed of some kind of matter different from that of the nerves; or if both are made of the same materials, their organization must be exceedingly different. But if the substance of the muscles and nerves is totally different, we may easily be convinced that much of the one is always mixed with the other; for it is impossible to prick a muscle even with the smallest needle, without wounding or lacerating many nervous fibres at the same time. Seeing, therefore, there is such a close connection between the muscles and nerves both as to their functions and structure, they are deservedly reckoned by physiologists to be parts of the same genus, called the *genus nervosum*, or *nervous system*.

After treating of sense in general, the Doctor proceeds to consider particularly each of the senses both external and internal. He begins with the sense of feeling, as being the most simple, and common to every part of the nervous system. In some places, however, it is much more acute than in others; in the skin, for instance, and especially in the points of the fingers. These are reckoned to have *nervous papillæ*, which by the influx of the blood are somewhat erected in the action of contact, in order to give a more acute sensation; though indeed this opinion seems rather to be founded on a conjecture derived from the structure of the tongue, which is not only the organ of taste, but also a most delicate organ of touch, than upon any certain observations.

From the sense of feeling, as well as all the other senses,

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either

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Of pain.

either pain or pleasure may arise; nay, to this sense we commonly refer both pain and almost all other troublesome sensations, tho' in truth pain may arise from every vehement sensation. It is brought on by any great force applied to the sentient part; whether this force comes from within or from without. Whatever, therefore, pricks, cuts, lacerates, distends, compresses, bruises, strikes, gnaws, burns, or in any manner of way stimulates, may create pain. Hence it is so frequently conjoined with so many diseases, and is often more intolerable even than the disease itself. A moderate degree of pain stimulates the affected part, and by degrees the whole body; produces a greater flux of blood and nervous power to the part affected; and often stimulates to such motions as are both necessary and healthful. Hence, pain is sometimes to be reckoned among those things which guard our life. When very violent, however, it produces too great irritation, inflammation and its consequences, fever, and all those evils which flow from too great force of the circulation; it disorders the whole nervous system, and produces spasms, watching, convulsions, delirium, debility, and fainting. Neither the mind nor body can long bear very vehement pain; and indeed nature hath appointed certain limits, beyond which she will not permit pain to be carried, without bringing on a delirium, convulsions, syncope, or even death, to rescue the miserable sufferer from his torments.

Long continued pain, even though in a more gentle degree, often brings on a debility, torpor, palsy, and rigidity of the affected part. But if not too violent, nor accompanied with fever, sickness, or anxiety, it sometimes seems to contribute to the clearness and acuteness of the judgment, as some people testify who have been afflicted with the gout.

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Anxiety.

Anxiety is another disagreeable sensation, quite different from pain, as being more obfuse and less capable of being referred to any particular part, though frequently more intolerable than any pain. But we must take care to distinguish between this anxiety of which we treat in a medical sense, and that which is spoken of in common discourse. The latter doth not at all depend on the state of the body, but belongs entirely to the mind; and arises from a sense of danger, or a foresight of any misfortune. The former is truly corporeal; and derives, no less than pain, its origin from a certain state of the body. Notwithstanding this difference, however, it is very possible for both these kinds of anxiety to be present at the same time, or for the one to be the cause of the other. A very great bodily anxiety will strike fear and anxiety into the most resolute mind; and mental anxiety, on the contrary, if very violent and long-continued, may induce the former, by destroying the powers of the body, especially those which promote the circulation of the blood.

Anxiety, in the medical sense of the word, arises in the first place from every cause disturbing or impeding the motion of the blood through the heart and large vessels near it. Anxiety, therefore, may arise from many diseases of the heart and its vessels, such as its enlargement, too great constriction, ossification, polypus, palpitation, syncope, inflammation, debility, and also some affections of the mind. It is likewise produced by every difficulty of breathing, from whatever cause it may arise; because then the blood passes less freely

through the lungs: anxiety of this kind is felt deep in the breast. It is said also to arise from the difficult passage of the blood through the liver or other abdominal viscera.

A certain kind of anxiety is very common and troublesome to hypochondriacal people; and arises from the stomach and intestines being either loaded with indigested and corrupted food, or distended with air produced by fermentation and extricated from the aliments. By such a load, or distension, the stomach, which is a very delicate organ, becomes greatly affected. Besides, the free descent of the diaphragm is thus hindered, and respiration obstructed. Anxiety of this kind is usually very much and suddenly relieved by the expulsion of the air; by which, as well as by other signs of a bad digestion, it is easily known. In these cases the anxiety is usually, tho' with little accuracy, referred to the stomach.

Anxiety also frequently accompanies fevers of every kind, sometimes in a greater and sometimes in a lesser degree. In this case it arises as well from the general debility, as from the blood being driven from the surface of the body and accumulated in the large vessels; as in the beginning of an intermittent fever. Or it may arise from an affection of the stomach, when overloaded with crude, corrupted aliment; or distended and nauseated with too much drink, especially medicated drink. As the fever increases, the anxiety of the patient becomes greater and greater; remarkably so, according to the testimony of physicians, either immediately before the crisis, or on the night preceding it; as before the breaking out of exanthemata, hemorrhagy, sweat, or diarrhoea, which sometimes remove fevers. The patient feels likewise an anxiety from the striking in of any eruption or critical metastasis. This sensation also accompanies fevers and most other diseases, when the vital power is exhausted, and death approaches, of which it is the forerunner and the sign. It happens at that time, because the vital powers, unable to perform their functions, cannot make the blood circulate. But what kind of anxiety this is, the other signs of approaching death shew very evidently. Moreover, even in the time of sleep, anxiety may arise from the same causes: hence frightful dreams, which frequently disturb our repose with surprise and terror.

Itching, an uneasy sensation, with a desire of scratching the place affected, is often very troublesome, altho' it seems to be more akin to pleasure than to pain. As pain proceeds from too great an irritation, either chemical or mechanical, so does itching proceed from a slight one. Titillation, or friction, of a woollen shirt, for instance, upon the skin of a person unaccustomed to it, and of a delicate constitution, excites itching; as do also many acrid fossils, vegetables, and animals. Hence an itching is the first sensation after the application of cantharides, although the same, when augmented, becomes painful. The same effect is produced by any thing acrid thrown out upon the skin; as in exanthematic fevers, the disease called the *itch*, &c. Lice, worms, especially ascarides, irritating either the skin or the intestines, excite a troublesome itching. Certain species of internal itching excites people to many necessary actions both in a diseased and healthy state, such as the excretion of the feces and urine, coughing,

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itching.



THEORY. ing, sneezing, and the like.

THEORY.

Too acute a sensation over the whole body is very rarely if ever observed. In a particular part the sense of feeling is often more acute than it ought to be, either from the cuticle itself being too thin and soft, or being removed; or from the part itself being inflamed, or exposed to too great heat. It becomes obtuse, or is even quite destroyed over the whole body, or in great part of it, from various affections of the brain and nerves; as when they are wounded, compressed, or defective in vital power. This is called *anæsthesia*, and sometimes accompanies palsy.

This sense may be deficient in a particular part, either from the nerve being diseased, or from its being compressed or wounded, or from the part itself being exposed to too great a degree of cold;—or from the scarf-skin which covers it being vitiated, either becoming too thick or hard, by the handling of too rough, or hard, or hot bodies, as is the case with glass-makers and smiths; or from the elevation of the cuticle from the subjacent cutis, or true skin itself, by the interposition of blood, serum, or pus; or from the cutis being macerated, relaxed, or become torpid, which sometimes happens to hydropic persons; or lastly, from the whole organ being corrupted by gangrene, burning, cold, or contusion. This sense is very rarely depraved, unless perhaps in the case of delirium, when all the functions of the brain are disturbed in a surprising manner.

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Of taste.

The sense next to be considered is that of taste, the principal organ of which is the tongue; and the nearer the tip of it, the more acute is the sense, and the nearer the glottis so much the more obtuse. It must be owned, however, that some kind of acrid substances, the taste of which is scarce perceived upon the tip of the tongue, excite a most vehement sensation about its roots, or even in the throat itself. The tongue is endowed with many large and beautiful nervous papillæ, which seem to be the chief seat of this sense, and in the act of tasting are elevated and erected in order to give the more acute sensation.

Nothing can be tasted which is not soluble in the saliva, that, being applied in a fluid form, it may pervade the involucre of the tongue, and affect its nervous pulp; and hence insoluble earths are quite insipid. Neither is it sufficient for a body to be soluble that it may be tasted: it must also have something in it saline, or at least acrid, in order to stimulate the nervous substance; and hence, whatever has less salt than the saliva is totally insipid.

The taste is rarely found to be too acute, unless through a fault in the epidermis which covers the tongue. If this is removed or wounded, or covered with ulcers, aphthæ, &c. then the taste, becoming too acute, is painful; or sometimes no other sensation than that of pain is felt. It may be impaired, as well as the sense of feeling, from various diseases of the brain and nerves; of which, however, the instances are but rare. In some people it is much more dull than in others; and in such the sense of smelling is usually deficient also. The taste is most commonly deficient on account of the want of saliva; for a dry tongue cannot perceive any taste: hence this sense is very dull in many diseases, especially in fevers, catarrhs, &c. as well on account of the defect of saliva, as of appetite, which

is of so much service in a state of health; or by reason of the tongue being covered with a viscid mucus.

The taste is frequently depraved; namely, when we have a perception of taste without the application of any thing to the tongue; or, if any thing is applied to it, when we perceive a taste different from what it ought to be. This happens for the most part from a vitiated condition of the saliva, which is itself tasted in the mouth. Hence we may perceive a sweet, saline, bitter, putrid, or rancid taste, according to the state of the saliva: which may be corrupted either from the general vitiated condition of the mass of humours, or the glands which secrete it; of the mouth itself; or even of the stomach, the vapours and eructations of which rise into the mouth, especially when the stomach is diseased.

Besides the faults of the saliva, however, the taste may be vitiated from other causes; as for instance the condition of the nervous papillæ. This, however, is as yet but little known to us; for the taste is sometimes plainly vitiated when at the same time the saliva appears quite insipid when tasted by other people.

Physicians, in almost every disease, but especially in fevers, inquire into the state of the tongue; not, indeed, without the greatest reason: for from this they can judge of the condition of the stomach; of the thirst, or rather the occasion the patient has for drink, when, on account of his delirium or stupor, he neither feels his thirst, nor is able to call for drink. And lastly, from an inspection of the tongue, physicians endeavour to form some judgment concerning the nature, increase, and remission of the fever.

The next sense considered by our author is that of smell. Its seat is in that very soft and delicate membrane, filled with nerves and blood-vessels, which covers the internal parts of the nose, and the various sinuses and cavities proceeding from thence. This sense is more acute about the middle of the septum, and the *ossa spongiosa*, where the membrane is thicker and softer, than in the deeper cavities, where the membrane is thinner, less nervous, and less filled with blood-vessels; although even these do not seem to be altogether destitute of smelling.

As by our taste we judge of the soluble parts of bodies, so by our smell we judge of those very volatile and subtle parts which fly off into the air; and like the organ of taste, that of smell is kept moist, that it may have the more exquisite sensation, partly by its proper mucus, and partly by the tears which descend from the eyes.

Some kinds of odours greatly affect the nervous system, and produce the most surprising effects. Some gratefully excite it, and immediately recruit the spirits when almost sinking; while some produce fainting, nay, as it is alleged, even sudden death. To this head also are we to refer those antipathies, which, though truly ridiculous, are often not to be subdued by any force of mind.

This sense is sometimes too acute, as well from some disease in the organ itself, which happens more rarely, as from the too great sensibility of the nervous system in general, as is sometimes observed in nervous fevers, phrenitis, and hysterics. It is more frequently, however, too dull, either from diseases of the brain and nerves, as from some violence done to the head, or from some internal cause; or it may proceed

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from a dryness of the organ itself, either on account of the customary humours being suppressed or turned another way, or from the membranes being oppressed with too great a quantity of mucus or of tears. Of both these cases we have instances in the catarrh, where at first the nostrils are dry, but afterwards are deluged with a thin humour, or stopped up with a thick one. But in these, and many other examples, the membrane of the nose itself is affected with inflammation, relaxation, or too great tension, by which it is impossible but the nerves, which constitute a great part of it, must be vitiated. It is evident also, that whatever obstructs the free entrance of the air into the nostrils, or impedes its passage thro' them, must prove detrimental to the sense of smelling.

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Of hearing.

The sense of hearing is more frequently vitiated than almost any of the rest, as having a most delicate organ, and one composed of many and very small parts, of which an account is given under the article ANATOMY, n° 405.—It frequently becomes too acute; either from the general habit of the body being too irritable, such as often happens to hysterical and lying-in women; or from too great a sensibility of the brain itself, which is not unfrequently observed in fevers, as well as in phrenitis, and sometimes in the true mania; or it may be from a disease of the ear itself, as when it is affected with inflammation, pain, or too great tension.—It may be rendered dull, or even altogether destroyed, so that the person shall become totally deaf, from the same causes acting with different degrees of force. This happens especially from the want of the external ear; or the from meatus auditorius being stopped up with mucus, wax, or other matters; or from the sides of the canal growing together, as sometimes happens after suppuration, or the small-pox; or by the membrane of the tympanum becoming rigid or relaxed, or being eroded or ruptured; or the tympanum itself, or the eustachian tube, may from certain causes be obstructed; or some of the little bones or membranes, or some of the muscles of the labyrinth itself, may be affected with concretion, spasm, palsy, or torpor; or lastly, it may happen from diseases of the brain and nerves, all the organs of hearing remaining sound. Hence deafness is often a nervous disease, coming suddenly on, and going off of its own accord. Hence also it is common in old people, all of whose solid parts are too rigid, while their nervous parts have too little sensibility.

Persons labouring under fevers, especially of the typhus kind, often become deaf. When this comes on along with other signs of an oppressed brain, and a great prostration of strength, it may be a very bad sign; but for the most part it is a very good one, even though accompanied with some degree of torpor or sleepiness.

A very common disease in the sense of hearing is when certain sounds, like those of a drum, a bell, the falling of water, &c. are heard without any tremor in the air, or without a sound person's hearing any thing. This disease is called *tinnitus aurium*, of which various kinds have been observed. For the most part it is a very slight transient disorder; but sometimes it is most obdurate, long-continued, and troublesome. It sometimes arises from the slightest cause, such as any thing partially stopping up the

meatus auditorius or eustachian tube itself, so that access is in part denied to the air; whence it happens that the latter strikes the membrane of the tympanum, or perhaps the interior parts, unequally, and with too much force. Hence *bombi*, a kind of tinnitus, are heard even by the most healthy when they yawn.

A much more frequent and troublesome species of tinnitus accompanies many diseases both of the febrile and nervous kind. This is occasioned partly by the increased impetus of the blood towards the head, with an increase of sensibility in the nervous system itself, so that the very beatings of the arteries are heard; and partly from the increased sensation and mobility of the nerves and muscles of the labyrinth; whence it happens, that the parts which ought to be at rest until excited by the tremor of the air, begin to move of their own accord, and impart their motion to other parts which are already in a morbid state of too great sensibility.

A tinnitus sometimes arises from any vehement affection of the mind; sometimes from a disorder in the stomach; sometimes from a rheumatic disorder affecting the ears and head; or from a catarrh, which commonly affects the tube. Sometimes, however, the tinnitus alone affects the patient; and even this is a disease of no small consequence. These various causes, however, both of this and other disorders of the hearing, are often very difficult to be distinguished, as well on account of the inaccessible situation of the organ, as on account of the little knowledge we have of its action. But from whatever cause it arises, both this and the other various affections of the hearing, can neither be cured certainly nor easily.

Concerning the nature of the sense of sight, see OF VISION.

ANATOMY, n° 406, and (the *Index* subjoined to) OPTICS.—Of this sense some slight disorders, or rather varieties, are often observed. Those persons are called *short-sighted* who cannot see distinctly unless the object be very near them. This disorder arises from too great a refraction of the rays by reason of their being too soon collected into a focus by the crystalline lens, and diverging again before they fall upon the retina, by which means they make an indistinct picture upon it. The most usual cause is too great a convexity of the eye or some of its humours, as too prominent a cornea. It is a disorder common to young people, which is sometimes removed when they grow older. As soon as the first approaches of short-sightedness are observed, it is supposed it may be obviated by the person's accustoming himself to view remote objects, and keeping his eyes off very small and near ones; as, on the contrary, it may be brought on by the opposite custom; because the eye accommodates itself somewhat to the distances of those objects which it is accustomed to view. But a concave glass, which causes the rays of light to diverge more than naturally they would before falling upon the cornea, is the most simple and certain remedy.

*Long-sighted* people are those who cannot see an object distinctly unless it be at a considerable distance sighted from them. This arises from causes contrary to the former; namely, the eye being too flat, so that there is no room for refracting the rays and bringing them into

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into a focus. Hence this defect is common in old people, and remedied by the use of convex glasses.

Those are called *mytologes* who see better with a very weak than with a strong light. It is a defect very seldom to be met with in the human race, though every person is sensible of it who hath been long kept in the dark and is then suddenly brought into the light. The disease arises from too great a sensibility of the retina, and the pupil being too open.

The sight is liable to many and grievous disorders. It is sharpened beyond measure, so that the person either perceives nothing distinctly, or with great pain, from the same causes that induce a similar disorder in the other senses; namely, excessive sensibility in the general habit of body; or a particular state of the brain common in phrenitics, or even in those afflicted with fevers arising from inflammation or too great excitement; though more frequently from the condition of the eye itself, one becomes unable to bear the light. The inflammation of the tunica adnata, and the fore-part of the sclerotics, is communicated to the back parts of it, and from thence to the choroids and retina itself. Hence the light becomes intolerable, and vision is attended with pain and great irritation, sometimes inducing or augmenting a delirium.

The sense of seeing is made dull, or even totally abolished, by age; the aqueous humour not being supplied in sufficient quantity, and the cornea and lens, or the vitreous humour, becoming shrivelled or decayed. It may likewise happen from the cornea becoming dry and opaque; which is to be imputed to the languid motion of the blood, and to great numbers of the small vessels being obstructed or having their sides constricted;—or from the crystalline lens becoming yellow like amber, and the retina itself less sensible, for old age diminishes every sensation. It is totally abolished by injuries of the brain, the optic nerve, or the retina, even though the structure of the organ should remain sound. This disease is called an *amaurosis*; and is easily known by the dilatation and immobility of the pupil, the humours of the eye remaining clear. It is commonly owing to congestion of blood; and sometimes, where no congestion of blood can be shown, to mere stupor of the nerves. If it be only a torpor of part of the retina, we see black spots in those things at which we look; or flies seem to pass before our eyes, a very bad sign in fevers, and almost always mortal.—The sight is abolished also by the obscurity or opacity of any of the parts through which the rays ought to pass and be refracted; as if the cornea lose its transparency by being covered with spots; or the aqueous humours become corrupted with blood, serum, or pus; or the lens (which often happens and which is called a *cataract*) becomes of a grey or brown colour, or the vitreous humour be in like manner corrupted; or lastly, when all the humours being dissolved, confused, and mixed together, by inflammation and suppuration, either do not suffer the light to pass at all, or to pass imperfectly and unequally; whence either no image is formed on the retina, or it appears obscure, distorted, imperfect, and ill-coloured.

The sight is also depraved, when things appear to it of a colour different from their own, or even in another situation and of another shape than

they ought to have. This happens from the humours being tinged with any unusual colour, as is said to happen in the jaundice; or from an extravasation and mixture of the blood with the aqueous humour. A surprising depravation also, or constant and perpetual defect of vision, is not unfrequently observed in men otherwise very healthy, and who see quite clearly; namely, that they cannot distinguish certain colours, green, for example, from red \*. Another depravation is, when, without any light being admitted to the eyes, sparks, small drops of a flame or gold colour, and various other colours, are observed to float before us. This is generally a very slight and transient disorder, common to those whose constitutions are very irritable; and arises from the slight impulse, as it would seem, on the retina, by the vessels beating more vehemently than usual. A fiery circle is observed by pressing the eye with the finger after the eyelids are shut. The same reason, perhaps, may be given for those sparks which are seen by persons labouring under the falling-sickness, and increasing to the size of an immense and luminous beam before they fall down in convulsions. A similar beam those who have recovered from hanging or drowning testify that they have observed: for by reason of the respiration being suppressed, the vessels of the head swell and compress the whole brain and nervous parts of the head. Sparks of the same kind, and these too of no good omen, are observed in patients labouring under a fever, where a phrenitis or fierce delirium is at hand; and likewise in those who are threatened with palsy, apoplexy, or epilepsy.—A distinct but false perception, namely of visible things which do not exist, is to be imputed to some injury of the brain, to madness or a delirium, not to any disease of the eye.

A very frequent defect of vision remains to be mentioned; namely, squinting. A person is said to squint who has the axes of the eyes more oblique than usual, and directed to different points. Hence a great deformity, and often an imperfect and confused vision by which the objects are sometimes seen double. It is an evil for the most part born with the person, and often corrected by those attempts which an infant makes to see more pleasantly and distinctly; and this even without being conscious of its own defects. It is also easily learned, especially in infants, even without their own knowledge, by that kind of imitation which has a great influence over the human race, especially in their tender years.—It is by no means, however, so easily unlearned.

Squinting is frequently occasioned by a spasm, palsy, rigidity, &c. of the muscles which manage the eye; by epilepsy; by certain diseases of the head, the hydrocephalus especially; or by any great injury done to the head. Sometimes, though very rarely, it comes on suddenly without any known cause. It is very probable, however, that squinting often arises from a fault of the retina, when their central points, for instance, and those similarly placed with respect to the centre, do not agree. In this case there must be a contortion of the eye, that the object may not be seen double. This seems also to be the reason that squinting is horribly increased when the person brings the object near his eye in order to view it more perfectly. Or if the central point of either, or both, of the retina be insensible,

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various disorders in vision.

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sible, or nearly so, it is necessary for the person to distort his eyes that he may have any distinct vision of objects. If the optic nerve had not entered the retina obliquely, but passed directly through its centre, we would all either have squinted, or seen double.

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Of vertigo.

Physicians have referred to the sense of vision that most troublesome sensation which we call a *vertigo*: though it seems rather to belong to that of feeling, or of consciousness; for the disorder is not removed either in the dark, or by shutting the eye-lids. The vertigo takes place when external objects really at rest seem to reel, to whirl round, to tremble, or to move in any manner of way. If the disorder be very violent, the person is neither able to see, on account of a dimness of sight; nor can he stand, as the powers fail which ought to govern the limbs. A nausea also usually accompanies the vertigo, and the one generally produces the other.

This disorder is observed to be both the symptom and forerunner of some dangerous diseases; such as apoplexy, epilepsy, hysteria; hemorrhages from the nose and other parts; suppressions of the menses; great plethora; fevers, as well such as are accompanied with debility, as those in which there is an increased impetus of the blood towards the head. An injury done to the head also, but rarely one done to the eyes unless in so far as it affects the whole head, brings on a vertigo. A vertigo may be likewise produced by a very great and sudden loss of blood or other fluid; debility; syncope; various diseases of the alimentary canal, of the stomach especially; poisons admitted into the body, particularly of the narcotic kind, as opium, wine, &c. and hence vertigo is a symptom of every kind of drunkenness. Various motions also, either of the head or the whole body, being tossed in a ship, especially if the vessel is small and the sea runs high, produce a vertigo. In these and similar examples, the unusual and inordinate motions of the blood are communicated to the nervous parts which are in the head; or these being affected by sympathy from the neighbouring parts, produce a confused sensation as if of a rotatory motion. Nay, it is often produced from an affection of the mind itself, as from beholding any thing turned swiftly round, or a great cataract, or looking down a precipice, or even by intense thought without looking at any thing.

Though a vertigo be for the most part a symptom and concomitant of other diseases, yet it is sometimes a primary disease, returning at intervals, increasing gradually, and equally impeding and destroying the functions of the body and mind.

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Disorders of the internal senses.

Having thus treated of the external senses, the Doctor next proceeds to consider those properly called *internal*; which are, the *memory*, the *imagination*, and the *judgment*. The first is lessened, disturbed, or even totally destroyed, in many diseases, especially those which affect the brain; as the apoplexy, palsy, internal tumours of the head, external violence applied, fevers, especially those in which there is an increased motion of the blood towards the head, or where the brain is any other way very much affected. It is very rarely, however, depraved in such a manner that ideas are not represented to the mind in their proper order; or if at any time such a disorder occurs, it is considered rather as a disorder of the imagination, or as a de-

lirium, than a failure of the memory. The mind is said to be disordered when the perceptions of memory or imagination are confounded with those of sense, and of consequence those things believed to be now present which are really past or which never existed; or when the sense of the person concerning ordinary things is different from that of other people. The general name for such disorders is *vesania*: if from fever, it is called *delirium*. A general fury without a fever, is called *mania*, or *madness*: but a partial madness, on one or two points, the judgment remaining sound in all other respects, is called *melancholia*. There is, however, no exact and accurate limits between a sound mind and madness. All immoderate vivacity borders upon madness; and, on the other hand, a sorrowful and gloomy disposition approaches to melancholy.

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Delirium.

Delirium accompanies fevers of many different kinds. Sometimes it is slight, easily removed, and scarce to be accounted a bad sign. Often, however, it is very violent, and one of the very worst of signs, requiring the utmost care and attention.

A delirium is either fierce or mild. The fierce delirium is preceded and accompanied by a redness of the countenance, a pain of the head, a great beating of the arteries, and noise in the ears; the eyes in the mean time looking red, inflamed, fierce, shining, and unable to bear the light; there is either no sleep at all, or sleep troubled with horrid dreams; the wonted manners are changed; an unusual peevishness and ill-nature prevail. The deprivation of judgment is first observed between sleep and waking, and by the person's crediting his imagination, while the perceptions of sense are neglected, and the ideas of memory occur in an irregular manner. Fury at last takes place, and sometimes an unusual and incredible degree of bodily strength, so that several people can scarce keep a single patient in his bed.

The mild delirium, on the contrary, is often accompanied with a weak pulse, a pale collapsed countenance, and a vertigo when the patient sits in an erect posture; he is seldom angry, but often stupid, and sometimes remarkably grieved and fearful. The loss of judgment, as in the former kind, is first perceived when the patient is half awake; but a temporary recovery ensues upon the admission of the light and the conversation of his friends. The patient mutters much to himself, and attends little to the things around him; at last, becoming quite stupid, he neither feels the sensations of hunger or thirst, nor any of the other propensities of nature, by which means the urine and excrements are voided involuntarily. As the disorder increases, it terminates in subsultus tendinum, tremors, convulsions, fainting, and death. The other species of delirium also frequently terminates in this, when the spirits and strength of the patient begin to fail.

The symptoms accompanying either of these deliria, shew an unusual, inordinate, and unequal motion of the blood through the brain, and a great change in that state of it which is necessary to the exercise of the mental powers. It is sufficiently probable, that an inflammation of the brain, more or less violent and general, sometimes takes place, although the signs of universal inflammation are frequently slight. This we learn from the dissection of dead bodies, which often shew an unusual redness of the brain or of some of its parts, or some-

HEORY. sometimes an effusion or suppuration.

The state of the brain, however, may be much affected, and a delirium induced, by many other causes besides the motion of the blood. In many fevers, typhus, for instance, the nervous system itself is much sooner and more affected than the blood; and though the morbid affections of the nervous system are as invisible to the senses as the healthy state of it, the symptoms of its injuries plainly shew that its action, or excitement as we call it, is unequal and inordinate. In this way, too, a delirium is produced by several poisons.

The pathology of melancholy and mania is much more obscure; as coming on without any fever, or disturbance in the blood's motion. Often also they are hereditary, depending on the original structure of the body, especially of the brain; the fault of which, however, cannot be detected by the nicest anatomist. It is known, however, that various diseases of the brain, obstructions, tumours, either of the brain itself, or of the cranium pressing upon it, any injury done to the head, and, as some physicians relate, the hardness and dryness of the brain, and some peculiar irritations affecting the nervous system, are capable of bringing on this malady. And indeed so great is the irritation of the nervous system in mad people, that they often sleep little or none for a long time.—Yet even this so defective and imperfect knowledge of the diseases of the brain and nerves, is by no means free from difficulties. For tho' we know that the brain, or a certain part of it, is hurt, or that it is irritated by a swelling, or a pointed bone growing into it, nobody can foretell how great, or what may be the nature of the malady from such a hurt: for examples are not wanting of people who, after losing a large part of the brain, have recovered and lived a long time; or of those who have perceived no inconvenience from a large portion of that viscus being corrupted, until at length they have fallen suddenly down and died in convulsions.

Another disease of the internal senses, quite different from these, is *fatiuty* or *idiotism*. Those are called *idiots*, who are destitute either of judgment or memory, or else have these faculties unequal to the common offices of life. A kind of idiotism is natural and common to all infants; neither is it to be accounted a disease. But if it lasts beyond the state of infancy, it is a real disease, and for the most part incurable. It hath the same causes with the other diseases of the internal senses; although these can scarcely be detected by the eye or by the knife of the anatomist. It frequently accompanies, or is the effect of, epilepsy. Hence, if the epilepsy derives its origin from causes not seated in the head, as from worms lodging in the intestines, the fatuity may be cured by dislodging these, and removing the epilepsy. It is not unlikely that the fatuity of children, and the dotage of old men, may arise from the brain being in the former too soft, and in the latter too hard.

The muscular power may be diseased in a great number of ways. The mobility itself may be too great; but this must be carefully distinguished from vigour. The mobility is the ease with which the muscular fibres are excited into contraction. The vigour, on the other hand, is that power with which the contraction is performed. They are sometimes joined, but more frequently separate, and for the most part

the excesses of each are owing to contrary causes.

Too great mobility is when motions are excited by too slight a stimulus, or when too violent motions are produced by the customary stimulus. A certain habit of body, sometimes hereditary, renders people liable to this disease. Women have a greater share of mobility than men have. Infants have a great deal of mobility, often too great; youth has less than infancy, but more than man's estate; tho' old age has commonly too little. A lazy, sedentary life, full diet, a suppression of the usual evacuations, fullness of the blood-vessels, and sometimes their being suddenly emptied, laxity, flaccidity of the solids in general, but sometimes too great a tension of the moving fibres, the use of diluents, especially when warm, or heat applied in any manner, produce too great mobility. And this may be either general or particular, according as the causes have been applied to the whole body, or only to a part of it.

Vigour in general is rarely morbid; although sometimes certain muscular parts appear to have too great strength. In manics and phrenitics, an immense strength is observed in all the muscles, especially in those that serve for voluntary motion; which is not unjustly reckoned morbid. The reason of this excess is very obscure; however, it is plainly to be referred to a diseased state of the brain.

A more frequent and more important excess of vigour is observed in those muscular fibres that do not obey the will, such as those which move the blood. Its circulation is thus often increased, not without great inconvenience and danger to the patient. But a slighter excess of this kind, pervading the whole body, renders people apt to receive inflammatory diseases, and is usually called a *phlogistic diathesis*. But this is better observed when local, as in inflammation itself.

Too great vigour of the muscular fibres may arise, from the nervous power increased beyond measure, as in mania, phrenitis, or violent affections of the mind; from too great a tension of the fibres, by which they more easily and vehemently conceive motions, as of the arteries when filled with too much blood; from catching cold, by being exposed either to cold or heat, as usually happens in the spring; or lastly, though the nervous power and tension of the fibres should not at all be changed, their action may become too great, from a stimulus more violent than usual being applied, or from the usual stimulus if the fibres themselves having already acquired too great a share of mobility.

The opposite to too great mobility is torpor, and too great vigour is debility. Torpor is such a diminution of mobility as renders the parts unequal to their functions. It arises from causes directly opposite to mobility; such as, in the first place, a harder and more rigid texture of the parts themselves, or even sometimes from one too lax and flaccid; from old age; from some peculiar temperament of body, such as one phlegmatic, frigid, or insensible; too great and incessant labour, cold, spare diet, and an exhausted body. This evil is the more to be dreaded, because, the powers of the body being deficient, nature is neither able to make any effort of herself, nor are the remedies, in other cases the most efficacious, capable of affording her any assistance.

Debility

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Debility takes place, when the motion of the muscles, either voluntary or involuntary, is not performed with sufficient strength. A greater or lesser share of debility, either general or of some particular part, accompanies almost all diseases, and is indeed no small part of them. It likewise renders a man obnoxious to innumerable disorders, and throws him as it were defenceless in their way. It often depends on the original structure of the body, so that it can be corrected neither by regimen nor medicines of any kind. A different degree of strength also accompanies the different ages of mankind; and thus, in some cases, debility cannot be reckoned morbid. But a truly morbid and unwonted debility arises from the nervous force being diminished; from diseases of the brain and nerves, or of the muscles through which they are distributed; from a decay of the nerves themselves; from a want of the due tension of the fibres, or the fibres themselves becoming torpid; from the body exhausted by spare diet, want, evacuations; or lastly, from diseases affecting the whole body, or some particular parts of it.

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Of palsy.

The highest degree of debility, namely, when the strength of the muscles is altogether or nearly destroyed, is called *paralysis* or *palsy*; and is either universal, or belonging only to some particular muscles. An universal palsy arises from diseases of the brain and nerves, sometimes very obscure, and not to be discovered by the anatomist; for the nervous power itself is often deficient, even when the structure of the nerves remains unhurt: yet often, a compression obstruction, or injury of the vessels, extravasation of blood, or serum, collections of pus, swellings, &c. are discovered. It frequently arises from certain poisons acting on the nerves; from the fumes of metals; from the diseases of parts, and affections of the muscles, very remote from the brain, as in the colic of Poitou. A palsy of single muscles, but less perfect, often arises without any defect of the brain or nerves, from any violent and continued pain, inflammation, too great tension, relaxation, rest, or destruction of the texture of the parts, such as commonly happens after the rheumatism, gout, luxations, fractures of the bones, and ischuria.

An *universal* palsy, however, as it is called, seldom affects the whole body, even though it should originate from a disease of the brain. We most commonly see those that are paralytic affected only on one side, which is called an *hemiplegia*. It is said that the side of the body opposite to the diseased side of the brain is most commonly affected. If all the parts below the head become paralytic, it is called a *paraplegia*. In these diseases the senses for the most part remain; though sometimes they are abolished, and at others rendered dull. Sometimes, tho' rarely, and which is an exceeding bad symptom, the motion, sensation, pulse, and heat of the paralytic limbs are lost; in which case the arteries themselves become paralytic. A palsy of the whole body, as far as regards the voluntary motions, with anæsthesia and sleep, is called an *apoplexy*. This proceeds from some injury of the brain: though a state very similar to it is induced by narcotics, opium, wine itself, or any generous liquor taken to excess; and lastly, by breathing in fixed or mephitic air, or that which is poisoned and

corrupted with phlogiston.

Another disease to which muscular motion is liable, and that neither slight nor unfrequent, is called *spasm*. This is a violent and irregular motion of the muscles, of which there are two kinds, the tonic and clonic. The latter is frequently called a *convulsion*; in order to distinguish it from the other, which is more peculiarly called *spasm*.

Spasm therefore is a violent, constant, and preternatural contraction of the muscular fibres; but a convulsion is an unusual and violent contraction alternated with relaxation. People are rendered liable to spasm by too sensible an habit of body, or too great mobility; and hence it is a disease common in women, in infants, and in weak, luxurious, lazy, and plethoric people. It is brought on those already predisposed to it, by any kind of stimulus applied to the brain, or to any nerve, muscle, or nervous part connected with it: of which we have examples in dentition; worms lodged in the intestines, and irritating them; any acrid matter infecting the blood, or much affecting the stomach and intestines; the irritation of any nerve, or of the brain itself, by an exostosis, swelling, too great fulness of the vessels, pain, vehement affections of the mind, sudden evacuation, or poisons admitted into the body. Frequently, however, the malady originates from slight causes, little known, and not easily observed.

Spasm is both the cause and effect, and frequently constitutes the greatest part, of most diseases. It is often very difficult either to be known or cured; because it is so multifarious, and produces as many different symptoms as there are organs affected; of which it surprisingly disturbs, impedes, or increases the functions. It is a disease seated in the original stamina of the constitution; and neither to be removed by slight remedies, nor in a short time.

With regard to sleep, our author observes, that its sleep. use is sufficiently apparent from the effects which it produces in the body. It restores the powers both of mind and body when exhausted by exercise, giving vigour to the one and restoring its wonted alacrity to the other. It renders the muscles again active and moveable, after they have become wearied, rigid, painful, and trembling by hard labour. It moderates the quickness of the pulse, which usually increases at night; and brings it back to its morning standard. It seems also to assist the digestion of the aliment; lessens down the secretions and excretions; and renders the fluids thicker than otherwise they would be, especially in a body endowed with little sensibility or mobility. Hence sleep is not only useful, but absolutely necessary for preserving life and health; and is a most excellent remedy both for alleviating, and totally removing, a great many diseases.

Want of sleep is hurtful in a great many different ways, especially to the nervous system. It renders the organs of sense both external and internal, as well as those of every kind of motion, unfit for performing their offices. Hence the sensations are either abolished, or become imperfect or depraved; and hence immobility of mind, defect of memory, a kind of delirium, mania itself, pain of the head, weakness of the joints, an imperfect or inordinate action of the vital organs, quickness of pulse, heat, fever, depraved digestion, atrophy, leanness, and an increase or

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Causes preventing and bringing on sleep.  
Sleep may be prevented both in healthy and sick people from various causes; such as strong light, noise, pain, anger, joy, grief, fear, anxiety, hunger, thirst, vehement desire, motion of the body, memory, imagination, intense thought, &c. On the other hand, sleep is brought on by a slight impression on the organs of sense, or none at all; by the humming of bees, the noise of falling water, cold and insipid discourse; or lastly, by such an exercise of the memory as is neither too laborious nor disturbing to the mind. Too great an impulse of the blood towards the head, such as often happens in fevers, prevents sleep; but a free and equal distribution of the blood through the whole body, especially the extreme parts, frequently brings it on. Whatever weakens the body also favours sleep; and hence various kinds of evacuations, the bath, fomentations, sometimes heat itself, are useful for promoting it. It also comes on easily after taking food, or indulging venery; the violent sensation being then quieted, and the body itself somewhat weakened. Cold produces a deep sleep of long continuance, not easily disturbed, and often terminating in death. Lastly, there are certain substances which, when applied to the body, not only do not excite the nervous system, but plainly lay us asleep, and render us unfit for sensation: of this kind are those called *narcotics*, as opium and the like; among which also we may reckon wine taken in too great quantity. Lastly, watching itself is often the cause of sleep; because while a man is awake he always more or less exercises the organs of his body, by which the nervous power is diminished and consumed; and thus the more violently the body is exercised, in the same proportion is the person under a necessity of sleeping.

Sleep is deficient in many diseases; for there are few which do not excite pain, anxiety, or uneasiness, sufficient to prevent the approach of sleep, or to disturb it. Fevers generally cause those who labour under them to sleep ill; as well on account of the uneasiness which accompanies this kind of diseases, as by reason of the impetus of the blood towards the head being frequently increased; and likewise from the stomach being disordered, loaded with meat, or distended with drink. Hence also we may see the reason why many hypochondriac and hysterical patients sleep ill; namely, because they have a bad digestion, and their stomach is disposed to receive many though frequently slight disorders; the slightest of which, however, is sufficient to deprive the patient of rest, provided the body be already irritable, and endowed with too great a share of mobility.

194  
Evils occasioned by too little or too much sleep.  
Want of sleep will hurt in diseases as well as in health, and for the same reason; but in a greater degree, and more quickly, in the former than in the latter; and is therefore not only a very troublesome symptom of itself, but often produces other very dangerous ones.

Too much sleep, on the other hand, produces many mischiefs, rendering the whole body weak, torpid, lazy; and even almost takes away the judgment. It also disturbs the circulation, and diminishes most of the secretions and excretions. Hence plethora, fatness, flaccidity, and an inability for the common offices of life.—The causes of this excess are, either the

usual causes of sleep above-mentioned increased beyond measure, or some fault in the brain, or a compression of it by an extravasation of the humours; or sometimes, as it would seem, from great debility produced by an unusual cause, as in those who are recovering from typhous fevers and other diseases. In these examples, however, this excess of sleep is by no means hurtful; not even, perhaps, in those cases where an excess of grief continued for a long time, or a great fright, have produced a surprising and unexpected somnolency. Lastly, many people have accustomed themselves, and that not without a great deal of hurt to their constitutions, to sleep too much. Nor are there examples wanting of some who have passed whole days, and even months, in sleep almost uninterrupted.

With regard to the manner in which the circulation of the blood is performed, and the various principles of which it is composed, see the articles BLOOD, and ANATOMY chap. x.—xiv.—As for the disorders to which the blood and its circulation are subject, our author observes, that in our younger years the veins are much more dense, firm, and strong, than the arteries; but the latter, by reason of the continual pressure upon them, and the strength which they exert, become daily more firm, hard, and strong, until at last they equal or exceed the veins themselves in strength; and it is not uncommon in old men to find some part of the arteries converted into an horny substance, or even into a solid bone. Hence in the state of infancy the greatest part of the blood is contained in the arteries, and in old age in the veins: an affair indeed of no small moment, as it shews the reason in some measure of the state of increase and decrease of the body. Besides, if any disease happens from too great a quantity of blood, it thence appears that it must shew itself in young subjects in the arteries, and in old ones in the veins; and this is the reason of many diseases which accompany certain periods of life.

195  
In most if not in all species of animals, the arteries of the females are much more lax and capacious when compared with the veins, and the veins much less, than in the males of the same genus. The design of nature in this conformation is evident, namely, that they may be the better able to nourish the foetus in their womb. The same likewise seems to be the reason why women are more inclined to plethora than men; and to this greater capacity of the arteries and smallness of the veins are we to ascribe that beauty and elegant shape of the arms in women, not disfigured or livid with veins as in men.

197  
The blood is also distributed in various proportions to the different parts of the body, and that proportion too differs at different periods of our lives. At first an immense quantity is sent to the head, because that part of the body is first to be evolved and fitted for its offices: but as soon as the parts begin to make a considerable resistance to the efforts of the blood, and the vessels cannot easily be further dilated, it is necessarily sent off to other parts; by which means the rest of the body increases in bulk, and becomes fitted for performing its proper functions. The effect of this change is also very soon observed, namely, when none of the blood passes through the navel, and of consequence a greater quantity is sent by the iliac arteries

THEORY. teries to the inferior extremities. These, though so small and slender in the fœtus, increase very suddenly; so that often in not many months the child can not only stand on its feet, but even walk tolerably well.

198  
Of the  
pulse.

Physicians are wont to judge of the state of the circulation by the pulse; which indeed is very various, as well with regard to its frequency, as to the strength and equality of its strokes and intervals.—Its common quickness in a healthy grown-up person is about 70 strokes in a minute. In a fœtus, perhaps, it is more than double; and in an infant a few months old, hardly less than 120. As we grow up, this quickness gradually diminishes; so that in extreme old age it sometimes does not exceed 50, or is even slower. This rule, however, is not without exceptions: for many, especially those of an irritable habit, have the pulse much quicker; while others, even in the vigour of their age, have the pulse remarkably slow. It is for the most part somewhat quicker in women than in men.

199  
When too  
quick.

The pulse is also rendered quicker, both in a healthy and diseased body, by the application of stimuli of many different kinds. Exercise especially, by accelerating the return of the blood through the veins, increases the quickness of the pulse to a surprising degree. Likewise various kinds of irritations affecting the nervous system, as intense thinking, passions of the mind, pain, heat, stimulating medicines, wine, spices, &c. produce the same effect. The acrimony of the blood itself also is thought to quicken the pulse.

When a person first awakes in the morning the pulse is slow, but becomes quicker by degrees on account of the many irritating matters applied to the body. Its quickness is increased after taking food, especially of the animal kind, or such as is hot or seasoned with spices. In the evening a slight fever comes on, for which rest and sleep are a remedy. These things, however, are scarce to be observed in a healthy person, but are very evident in one that is feverish, especially when the disease is a hectic.—Again, even debility itself often renders the pulse quicker than usual; because the ventricle of the heart not being quite emptied, it is the sooner dilated again, and of consequence contracts the sooner. For this reason a physician can never judge of the strength of the circulation from the frequency of the pulse.

Lastly, in all fevers, however different from one another, the pulse is found to be too quick, partly perhaps from debility, partly from the acrimony of the fluids, and partly from the repulsion of the blood from the surface of the body, and the accumulation of it in the large vessels where it acts as a stimulus; though it must be owned, that a great deal of this is obscure, if not totally unknown; nor in truth are we able to understand in what manner the *autocrateia* acts with regard to the frequency of the pulse.

200  
When too  
slow.

The pulse is seldom observed too slow, unless when the mobility of the body is much diminished, as in decrepid old age, or from a compression or disease of the brain; but a greater compression of the brain usually produces a vast quickness of the pulse, as in the hydrocephalus, apoplexy, &c. Sometimes also the pulse is too slow in those who are recovering from tedious fevers. But this is a matter of little moment,

and seems to be owing to some kind of torpor.

While the frequency of the pulse continues the same, its strokes may be either full, great, strong, and hard; or soft, small, and weak. A full, great, and strong pulse takes place when the ventricle strongly and completely empties itself; throwing out a great quantity of blood into the arteries, which fully distends them and stimulates them to strong contraction. A pulse of this kind is common in strong healthy men, and is seldom to be accounted a symptom of disease. But if it be too strong, and strike the finger of the person who feels it violently and sharply, it is called a *hard pulse*. This hardness is produced by a sudden and violent contraction of the heart and arteries, which distends even the remote branches, as those of the wrist, too suddenly and smartly, and excites them also to sudden and violent contractions.

A hard pulse therefore denotes too great an action of the heart and arteries. It may arise from various causes: in the first place, from too great a tension of the vessels; for instance, from their being too full, and by that means more prone to motion, and the more fit for receiving violent motions. It may arise also from too great a density and firmness of the solids; and hence it is most frequent in cold countries, among strong robust people, and such as are accustomed to hard labour. It may likewise arise from various causes irritating the whole nervous system, or only the heart and arteries. Lastly, it accompanies many fevers, as well as most inflammatory disorders, whether the inflammation arises from a general stimulus applied to the whole body, or from the irritation of particular parts, by degrees extended over the whole body. In such a state of the circulation, the patient frequently stands in need of blood-letting, and almost always bears it well.

A small, weak, and soft pulse is generally owing to causes opposite to the foregoing, and indicates a contrary state of the circulation and nervous system. It frequently requires stimulants; nor does it generally require blood-letting, or easily bear it. Sometimes, however, a pulse of this kind is observed even in the case of a dangerous inflammation, of the stomach for instance, or intestines. But in these and the like examples, we ought to attend to the nature of the malady, much more than to the state of the pulse.

The pulse is said to intermit, when the stroke does not return after the usual interval, and perhaps not till after twice, thrice, or four times the usual space. A pulse of this kind seems to be almost natural and constant in some animals, and is common to some men even in the most perfect health; and if these happen to be seized with a fever, the pulse sometimes becomes equal, nor can the disease be removed before the intermission hath returned.

Moreover, in some people, though their pulse beats equally while in health, yet the slightest illness makes it intermit; and in others, especially those who have a great deal of mobility in their constitution, such as hypochondriac and hysterical people, the intermission of the pulse is felt, without applying the finger to the artery, merely by the uneasiness which they perceive in their breasts during those intervals in which the pulse is deficient. An intermitting pulse likewise occurs in many diseases of the breast, especially when water is col-

201  
Full, great,  
strong and  
hard pulse  
defined.

202  
An inter-  
mitting  
pulse.

**THEORY.** collected in it; and the like happens in the end of all diseases, especially fevers, when the strength is nearly exhausted, and death approaches, of which it is frequently the forerunner.

An intermitting pulse therefore seems to arise from an unequal influx of the nervous power into the heart and other organs which promote the circulation, which indeed is of little moment; or from the decay and exhaustion of the nervous power, by which means the heart is not able to contract till it hath been distended beyond its due pitch. Or lastly, it may arise from diseases of the organ itself, or the neighbouring parts; from swellings, water, &c. pressing upon them, and impeding the action of the heart; which indeed is a very dangerous disorder, and almost always mortal.

Many other variations of the pulse are enumerated by physicians, but most of them uncertain, and not confirmed by experience in this country at least; we shall therefore now consider the motion of the blood, which may be either too great, too small, or irregular.

203  
A quick  
pulse.

A quick pulse, *cæteris paribus*, produces a more rapid circulation, because the sooner that the ventricle of the heart is emptied, the more quickly is the blood thrown into the arteries; and their actions must answer to this stronger stimulus. Hence exercise, heat, stimulants, plethora, every kind of irritation, passions of the mind, and fever, increase the circulation. The effect of this increase is a distension of the vessels, a stimulus applied to the whole body, an increase of heat, and often a debility. The secretion of sweat is increased while the other secretions are diminished, and the various functions of the body impeded; thirst comes on, the appetite is lost, the fat consumed, and a disposition to putrefaction introduced. Sometimes the smaller vessels are burst; whence effusions of blood and hæmorrhages. But we are by no means to forget, that this violent motion of the blood, however hurtful it may seem, is among the best remedies made use of by nature in curing many diseases.

204  
Diminution  
of the blood's motion.

The motion of the blood is diminished, especially by debility, torpor, the want of irritation or of exercise; the same thing happens to all the humours, if there is any obstruction in the vessels, or any cause by which their return is hindered or rendered more difficult. Thus, from the very weight of the blood itself, if a person hath stood long on his feet, the humours return more slowly from the inferior extremities. Any disease of the heart and arteries also, as an aneurism, contraction, ossification, must necessarily obstruct the circulation. The same thing happens from obstructions of the veins, or interrupted respiration, by which the passage of the blood thro' the lungs to the left side of the heart is impeded.

But, from whatever causes this diminution of the circulation takes place, the bad consequences are perceived chiefly in the veins, because in them the blood always moves more slowly than in the arteries. Hence varices, and congestions of blood, especially in those parts of the body where the veins are destitute of valves, and of consequence where the motion of the muscles cannot assist the circulation. Hence also arise dropsies from an impeded or languid motion of the blood; because the resistance of the veins being increased, the blood is received into them with the greater

difficulty, and more of the thin humour is driven into the exhaling vessels, and by them deposited in such quantities as cannot be reabsorbed by the lymphatics. These diseases, as well as all others proceeding from defects of the circulation, are also more difficult of cure than others, because all the vital powers are weakened at the same time.

205  
Irregular  
distribution  
of it.

Another disorder of the circulation is where the blood is carried to one part of the body in too great quantity, by which means the other parts are deprived of their due. This irregular distribution of the vital fluid frequently arises from a stimulus applied to the part itself, or to the brain, or at length acting on the mind, which, according to the laws of sympathy, produces a certain and definite distribution of the blood. It arises also not unfrequently from a spasm taking place in some other parts, which drives the blood out of its ordinary course.

In proportion to this irregularity of the circulation are the consequences; heat, swelling, redness, inflammation, rupture of vessels, hæmorrhages, effusions, destruction, corruption, and suppuration of the cellular texture and adjoining parts, &c. Even this evil, however, nature often converts into an excellent remedy; and physicians, following her steps, frequently attempt to direct the distribution of the blood in particular diseases, as well knowing that a change in the distribution of the blood is frequently efficacious either for radically curing some diseases, or relieving their most urgent symptoms.

Lastly, some disorders in the motion of the heart itself, and those of no small consequence, remain yet to be taken notice of, namely, palpitation and syncope. A palpitation is a violent and irregular action of the heart, such as for the most part is perceived by the patient himself, and that not without a great deal of uneasiness and oppression at his breast; and is also manifest to the by-standers if they apply their hands, or look at his naked breast; the pulse of the arteries in the mean time being weak, unequal, and intermitting. This is a spasmodic disorder; and is induced by various causes affecting either the nervous system in general, or the heart in particular. Every disease of the organ itself, such as a constriction of its valves and blood-vessels, an ossification, enlargement, or polypushindering the free action of the heart, and evacuation of blood from it, are capable of exciting it to violent and unusual contractions. The same effect will also follow plethora, or too violent an impulse of the blood, &c. The heart will likewise frequently palpitate from a violent excitement of the nervous system, especially where the constitution is endowed with a great deal of mobility. Hence palpitations from any affection of the mind, and in hysterical women. Palpitation may likewise arise from an affection of the stomach, occasioned by worms, a surfeit, flatulency, or stimulation by various acrid substances. It frequently also accompanies the gout when driven back, or even when a fit is coming on. Sometimes it arises from debility, whatever may be the cause; frequently from any difficulty in breathing; and many of these causes may be joined at the same time, or some of them produce others.

206  
Palpitation  
of the heart.

Hence we may see why the evil is sometimes slight and of short continuance; at other times altogether incurable, and certainly mortal in a longer or shorter time;

Hence we may see why the evil is sometimes slight and of short continuance; at other times altogether incurable, and certainly mortal in a longer or shorter time;





ations of thin humours, as sweat or urine, induced by cold, a fault of the secreting organs, or by putrescency. But along with this other disorders of the blood occur.

A too thin and watery blood makes the face pale, the body weak, languid and torpid; the solid parts become flaccid from want of nourishment and having too great a quantity of water in their composition. It brings on hydropic effusions of water in all parts of the body, by reason of the increased exhalation of that thin fluid which moistens all the inward parts; partly by reason of the blood itself being in some measure dissolved, so that it passes out of the vessels more easily and plentifully than it ought to do; and partly by reason of the vessels being relaxed beyond their usual pitch, and not making a proper resistance. Besides, in this case, the lymphatic veins are so far from absorbing more than usual, that, partaking likewise of general debility, they are scarce sufficient for performing their proper offices.

Nature, however, hath taken care, by the most simple means, to provide against so many and so great evils; for neither doth the blood so easily become thin as some have imagined, nor when this quality takes place doth it want a proper remedy. For almost instantly, if the person be otherwise in health, the excretions of the thinner matters are greatly augmented, and the whole mass of blood in a short time becomes as thick as formerly.

The opposite to this, namely, too great a thickness of the blood, though often spoken of by physicians, is very rarely, if ever observed; and those fevers and inflammations which have been thought to arise from thence, are now found to originate from other causes. The following would seem to be the law of the human constitution. As soon as the blood hath attained the due degree of thickness, or gone in the least beyond it, the excretions are either suppressed or diminished, the body attracts more moisture from the air, the person is thirsty, and drinks as much as is necessary for diluting the blood. But if water is wanting, and the person cannot satisfy his thirst, then the blood is so far from being thickened, that by reason of a putrescency begun or augmented, it is much dissolved, becomes acrid, and is with difficulty contained in the vessels.

The acrimony of the fluids hath afforded a large field for declamation to the speculative physicians, and upon this slender foundation many perplexed and intricate theories have been built. It is certain indeed, that the blood in a state of health hath some small share of acrimony; and this acrimony, from certain causes, may be a little increased so as to produce various diseases of a dangerous nature. This we are assured of from the increase of motion in the heart and arteries, and the similar augmentation of the action of the secretory organs, from acrid substances taken inwardly. The same thing also appears from the unusual acrimony of the secreted fluids in such cases, by which the vessels are sometimes greatly stimulated, and sometimes even quite eroded. Very many acrid substances, however, are daily taken into the stomach; so that these must either be corrected in the *prima viæ*, or changed by digestion before they pass into the blood; or at least, by dilution with much water, or being blunted by an admixture with gluten, oil, or phlogiston, they

must deposit much of their acrimony, and at last be thrown out of the body as noxious substances. Thus a vast quantity of salts, acid, alkaline, and neutral, may pass through the body without in the least affecting the health; though these salts, if taken in very large quantity, undiluted, or not thrown out of the body, will do much hurt.

Moreover, even while life continues, putrefaction is going on, and produces much of that substance called *animal salt*; for into this a great part of our food is converted and passes off by the urine. But if this putrescent disposition be too great, it will produce too large a quantity of animal salt; especially if much of any saline substance is otherwise thrown into the body without proper dilution: and this kind of disease is well known to sailors who have been long at sea without having an opportunity of getting fresh provisions.

For this spontaneous putrescency, nature hath suggested a proper remedy, namely, fresh meat, especially of the vegetable and aëreous kind, and such as is well impregnated with fixed air, which it may impart to the body. But where this kind of food is wanting, the putrefaction goes on apace, and a very great thinness and acrimony of the juices take place; especially if there be also a scarcity of water, or the excretions which ought to carry the putrid matters out of the body languish, either from cold, sloth, torpor, depressing passions of the mind, or from the constitution being broken by diseases; or lastly, from too great heat, which always favours putrefaction.

Besides, it would seem, that, sometimes a disposition to putrefaction is much increased by the reception of a putrid ferment into the body; of which we have examples in some infectious fevers, where the contagion is very much assisted by heat, animal diet, certain kinds of salts, debility, and nausiness.

Lastly, any single part of the body may putrefy from various causes, as from inflammation, gangrene, cold, &c. and thus may the whole body be infected; although for the most part the disease proves mortal before the corruption hath spread over the whole body.

But when the mass of blood begins to putrefy greatly, it not only becomes very acrid, but thin also, so that it either will not coagulate at all, or shews only a slight and very loose crassamentum. Nay, even the red globules are broke down and destroyed; in which case it is impossible but the blood must become very acrid, as well on account of the evolution of the salt, as by reason of the rancid and putrid gluten, which stimulates, and frequently even erodes, the vessels; producing spots, first red, then livid and black, tumours, and ulcers scarce possible to be cured without first removing the putrescent disposition of the humours. From the same causes proceed hæmorrhages from every part of the body, scarce to be restrained; a most intolerable factor of the breath and all the excretments; the highest debility and laxity of the solids; the putrefaction acting as a poison to the nervous system, and at length bringing on death.

An acrimony of the acid kind never takes place in Acid and the human blood, nor in any of the humours secreted from it; though one of them, namely the milk, turns acid spontaneously in a very short time after it is drawn from the breast. Neither, indeed, doth an alkaline acrimony seem ever to take place in the blood. Putrescency

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Putrescent

217

Acid

alkaline

acrimonies.

**THEORY.** frequencey indeed tends this way, and at last terminates in it; but scarcely while the person lives, though the nature of the urine, even while recent, seems to be but little distant from that of an alkali.

Many kinds of acrimony indeed may exist in the blood from too liberal an use of spices, wine, &c. but of these we know nothing certain. We are assured, however, that the body is often infected with various kinds of morbid acrimony, which bring on many and dangerous diseases, as the small-pox, measles, cancers, lues venerea, &c. of which the origin and manner of acting are very little known, though the effects are abundantly evident. In most cases, however, nature hath taken no less care to provide against the *acrimony* than against the too great *thickness* of the blood. Sometimes an antidote is afforded, either by the excitement of thirst, that the acrid substance may be diluted with plenty of drink; or by increasing the evacuations, that it may be thrown out of the body; or lastly, by exciting various motions and actions of the vital powers, by which it may be either subdued, changed, rendered innocent, or expelled from the body by new and unwanted passages.

218  
Of respiration.

With regard to respiration, our author observes, that it may be obstructed from various causes seated either in the lungs themselves, or the surrounding parts. But from whatever cause this obstruction may arise, it undoubtedly produces all those diseases which proceed from an interrupted circulation. The lungs themselves also being at length compressed, and not suffering to dilate sufficiently, cannot throw off the vapour which arises from them; and hence they are frequently oppressed with moisture. At the same time they are irritated, so that a greater quantity of mucus, and that of a thicker kind than usual, is secreted; by which means the passages through which the air enters them are stopped up, and a violent cough at length throws off the load.

The respiration is also subject to some other disorders, as a cough and sneezing; which, though at first sight they may seem very dangerous, are not destitute of use, and may even be reckoned among the most salutary attempts of nature to relieve the patient. Often, however, they are attended with danger, or very great uneasiness; namely, when they are either too violent, or exerted in vain. At any rate, it is necessary for a physician to know the nature, causes, and effects of these, that he may be enabled to promote them when necessary, to moderate them when too violent, and to stop them when noxious or to no purpose.

219  
A cough.

A cough is a violent, frequently involuntary, and sonorous expiration, suddenly expelling the air with great force through the glottis somewhat contracted. The convulsion of the muscles serving for expiration, gives a great force to the air, while the contraction of the glottis produces the sound. It is often long continued, being repeated at certain intervals, during each of which the inspiration is imperfect and obstructed by reason of the contraction of the glottis. It is excited by any kind of acrid substance, either chemically or mechanically applied to those passages through which the air enters. These are lined with a membrane so exceedingly delicate and impatient of stimulus, that it cannot even bear the touch of the mildest substance, such as a small drop of water, without throwing

ing the muscles serving for expiration into a violent convulsion; the glottis at the same time contracting by means of the sympathy between it and the neighbouring parts. Thus the air is thrown out with such violence, that it drives the irritating substance along with it; and thus a cough becomes not only useful, but absolutely necessary for the preservation of life, as being able to free the lungs from every kind of irritating substance or foulness, which might soon bring on a suffocation. Hence a cough is almost an inseparable companion of every inflammation of the lungs, as well as every difficulty in respiration; and even frequently accompanies the entrance of the purest air when the trachea and bronchiae are excoriated, or become too sensible. Examples also are not wanting, where a violent and troublesome cough hath arisen from an irritation of the nervous system, or even of some particular part, of the ear, for instance, the stomach and intestines by worms, the liver by inflammation, &c.

Coughing may also be voluntarily excited, and may then be managed at pleasure. Even when involuntary, it may be moderated, or suppressed, by a contrary effort; though a violent fit of coughing cannot by any means be resisted. When once it is excited, the cough goes on till the irritating substance be expelled, or the sense of irritation abolished, or perhaps overcome by a more uneasy sensation than even the cough itself; after which, the irritation again returning at a certain interval, the cough also comes on. Hence we are taught a method of allaying and quieting this most troublesome malady, though frequently it is not in our power to remove the cause of it altogether.

A very violent cough is often dangerous. For by the retention of the breath, and the strong efforts made in coughing, a great quantity of blood is collected in the lungs, of which the vessels are distended, and frequently broken; and hence there sometimes happens a violent, and even fatal hæmorrhage. More frequently, however, it is the cause of a slower, though equally fatal disease. Nay, a frequent and troublesome cough, without any great hæmorrhage, or even without any hæmorrhage at all, may damage the lungs to such a degree, especially if they be of a more tender structure than usual, as to lay the foundation of a phthisis almost always incurable.

Again, by a long-continued and violent cough, the passage of the blood through the lungs being impeded, it must necessarily flow through the veins towards the head: hence redness and lividness in the countenance, hæmorrhages, palsies, apoplexies, and sometimes mortal convulsions. Lastly, by a violent cough the abdominal viscera are perpetually compressed with remarkable violence; and if any part happens to be weaker than usual, hernia, a prolapsus uteri, abortion, or similar accidents, may happen.

Even when the cough is more gentle, if it happens to be importunate and frequent, although we have nothing of this kind to fear, yet the patient is by no means free from danger; as he is thereby agitated, fatigued, has his constitution broken, is deprived of rest, has a fever brought upon him, his lungs are shaken and irritated, digestion and all the other functions are impeded, till at last he sinks under a complication of maladies.

Sneezing is somewhat akin to the cough, as consisting

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Sneezing



ing of a very full inspiration, to which succeeds a most violent expiration, by which the air is driven out through the nostrils with immense violence, and sweeps the passage through them as it goes out. It is a convulsion much more violent than a cough, and is besides very difficult to be stopped when once a propensity to it hath taken place. As a cough proceeds from an irritation of the glottis, trachea, bronchia, and lungs, so doth sneezing arise from an irritation of the membrane of the nostrils, but rarely from sympathy with any distant part. It is sometimes of service, as well as a cough; though it is also sometimes prejudicial, for the reasons which have been already assigned.

The last part of the Doctor's treatise necessary to be taken notice of here, is that which considers diseases arising from a bad digestion, disordered motion of the intestines, and some of the principal secretions. The first of these, he says, are sometimes very troublesome, though seldom dangerous. The principal symptoms are oppression, anxiety, pain at the stomach; eructations, by reason of air extricated from the fermenting aliments, and irritating the stomach; nausea and vomiting, from the irritation and distension of the same organ; the belly sometimes too colive, and sometimes too loose; a defect of nourishment; a general debility; relaxation of the solid parts; too great thinness of the fluids; all the functions impeded; pain of the head; vertigo, syncope, asthma, palpitation; great sinking of the spirits, especially if the patient hath been of a peculiar constitution; sometimes the gout, sometimes a dropsy, or a slow fever which may prove mortal.

The motion of the intestines may be either too great or too little; and hence proceeds either coliveness, or looseness. The former is frequently not to be accounted morbid; but, when it is, it may arise from the structure of the intestines being injured, or from their being shut up or obstructed by spasm or otherwise, or from a deficiency of those humours which moisten the intestines; or it may arise from mere debility, from a palsy of the fibres perhaps, or from a deficiency of the usual stimulus, of the gall, for instance, or from too dry or slender a diet.

The consequences of long-continued coliveness, are first an affection of the alimentary canal, and then of the whole body. The stomach is diseased, and does not digest the aliments properly; the whole body is left destitute of its usual stimulus; the blood is corrupted, perhaps from the reformation of the putrid matter into it. The circulation through the abdominal viscera is impeded; hence frequent and irregular congestions, varices of the veins, hæmorrhoids, &c. Nay, the intestines themselves being overloaded, distended and irritated by an heavy, acrid, and putrid load of aliment or other matters, are excited to new and unusual contractions, which, if they do not get the better of the obstruction, bring on tormina, colic, or an iliac passion, inflammation and gangrene, fatal in a very short time.

Looseness, or diarrhœa, is a malady extremely common; being sometimes a primary disease, and sometimes only a symptom or an effect of others. Sometimes it is a salutary effort of nature, such as the physician ought to imitate and bring on by art. It is also familiar to infants, and to people of a certain

constitution, and to them coliveness is very prejudicial. It may arise, in the first place, from something taken into the body, or generated in the intestines; from a fermentation and corruption of the mafs of aliments; from the gall being too abundant and acrid, or from blood or pus poured into the intestines; from the intestines themselves being eroded, or deprived of their natural mucus; from the humours being driven from the surface of the body towards the inward parts, as by cold, especially when applied to the feet; or from a general corruption of the whole body, as in the phthisis, hectic, or putrid fever, especially towards the end of these disorders. In fevers it is sometimes salutary, or even puts an end to the disease altogether, or at least renders it milder: more frequently, however, deriving its origin from putrefecency, it is of no service, but rather exhaults the strength of the patient. A diarrhœa likewise, almost incurable, and often mortal in a short time, frequently arises after the operation for the fistula in ano. Some have their intestines so extremely weak and moveable, that from the slightest cause, such as catching cold, any violent commotion of the mind, &c. they are subject to a violent diarrhœa. Lastly, whatever be its origin, if it hath continued for a long time, the viscera are rendered so weak and irritable, that the disease, though often removed, still returns from the slightest causes, and even such as are not easily discovered.

A diarrhœa proves very pernicious, by hindering digestion and the nourishment of the body; for the stomach is commonly affected, and the aliments pass thro' the intestines so quickly, that they can neither be properly digested, nor are the lacteals able to absorb the chyle from them as they go along. Such a violent evacuation is also hurtful by exhausting the body, and carrying off a great quantity of the nutritious matter from the blood. Neither, indeed, is it only the alimentary mafs which is thrown out sooner than it ought to be; but at the same time a great quantity of the fluids secreted in the intestines, so that the whole body quickly partakes of the debility.

Sometimes a violent and long-continued diarrhœa<sup>224</sup> rises to such a height, that the aliment is discharged soon with little or no alteration. Sometimes also, though rarely, from a similar cause, or from the obstruction of the mesenteric glands, and its other passages into the blood, the chyle itself is thrown out like milk along with the excrements; and this disease is called the *celiac passion*.

A dysentery is attended with very severe gripes in the belly, a frequent desire of going to stool, and vain efforts which excrete nothing besides the mucus of the intestines mixed with a little blood; and is accompanied with excessive debility, and frequently with putrefecency and fever. It is thought to arise from the constriction of some part of the intestines, of the colon especially: by which means the bowels, though ever so much irritated, can pass nothing; neither can the disease be removed until the belly hath been well purged by proper medicines.

A tenesmus is a frequent and insatiable propensity to stool, without being able to pass any thing, notwithstanding the most violent efforts. It may be occasioned by any kind of irritation, either of the rectum itself or of the neighbouring parts, by acrid sub-

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substances taken into the body; by some of the stronger purges, especially aloes, which is very difficult of solution, and will pass even to the rectum with very little alteration; by a violent and obstinate diarrhœa, dysentery, hæmorrhoids, worms, fistula, calculus, ulcer in the bladder, urethra, &c. It is often very pernicious, both from the excessive uneasiness it occasions to the patient, and from its exhausting his strength, by the frequent and vain efforts bringing on a prolapsus ani, and communicating the violent irritation to the neighbouring parts, as the bladder, &c.

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Nausea and vomiting.

A nausea and vomiting are disorders very common, and owing to almost innumerable causes; not only to affections of the stomach itself, but also to affections and irritations of the remotest parts of the body which may act upon the stomach by sympathy. Every irritation and distention of that viscus therefore, a load of crude aliment, an obstruction about the pylorus, all acrid substances taken into it, diseases of the liver, intestines, kidneys, uterus, the head, the feet, of the whole skin, or indeed the whole body, inflammation, the stone, king's evil, scirrhus, apoplexy, compression of the brain, fracture of the skull, vertigo, syncope, violent pain, the gout, especially when repelled, fevers, passions of the mind, disagreeable imaginations or discourses, frequently induce nausea and vomiting.

These affections are often serviceable by freeing the stomach from something with which it was overloaded; promoting spitting in some cases where the lungs are overcharged with mucus, blood, pus, or water; producing sweat, and a free and proper distribution of blood to the surface of the body; partly, perhaps, by the great straining which accompanies vomiting, but rather by that wonderful sympathy which takes place between the stomach and skin: and hence, in many diseases, vomiting is a most excellent remedy. It is however in some cases hurtful, if too violent or too frequently repeated, partly by debilitating and making the stomach more easily moved; and partly by fatiguing the patient with violent strainings, which occasion hernias, abortions, &c.

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Iliac passion.

Sometimes we find the motion of the intestines totally inverted, from the anus to the mouth; a most dangerous distemper, which hath obtained the name of the *iliac passion*. It most frequently arises from some obstruction in the alimentary canal hindering the descent of the excrements, as scirrhus, spasm, inflammation, &c.: though the most perfect iliac passion takes place without any obstruction, so that clysters will be vomited; and even after this has continued for several days, the patients have at length recovered.

A slighter degree of the iliac passion, namely the inversion of the peristaltic motion of the duodenum, always takes place in long continued and violent vomiting, as in sea-sickness, or when a person hath taken too large a dose of an emetic; by which means a vast quantity of bile frequently ascends into the stomach, and is discharged by vomit.

229  
Cholera.

An excessive vomiting with looseness is called a *cholera*. It arises from a very great irritation of the alimentary canal without any obstruction; and is for the most part occasioned by too great a quantity, or from an acrimony of the bile, from whence it takes its name. It may originate from several causes, as

too strong a dose of an emetic and cathartic medicine, eating too great a quantity of summer-fruits, &c. and is a very violent malady, often killing the patient in a few hours, unless proper remedies be applied in time.

From a suppression of any of the secretions, or a disorder of any of the secretory organs, many mischiefs may arise. A diminution of perspiration produces plethora, lassitude, languor, depression of mind, bad digestion, loss of appetite, and even a general corruption of the humours from the retention of such a quantity of putrescent matter.—The more suddenly the diminution or suppression of the perspiration takes place, the sooner the mischief is produced, and the greater it is; not only by retaining the matter which ought to be thrown out, but by repelling the humours from the surface of the body, and directing them to other parts; whence fevers, inflammations, congestions of the blood, &c. frequently take place.

This suppression of perspiration may arise from many different causes; as from cold suddenly applied to the body when very hot; sometimes from very violent passions of the mind; or from spasmodic diseases, as the hysterics, &c. It may be suppressed also by that kind of constriction of the vessels of the skin which is produced by various kinds of fevers, and the nature of which hath hitherto been but little known.

Excessive perspiration or sweating is injurious by debilitating the body, relaxing the skin, and exposing the patient to all the evils which arise from catching cold.

It may even be carried to such a height as to produce fainting and death; though it must be owned that we cannot easily bring examples of people having from this cause their blood inspissated, corrupted, or being thence made liable to inflammations and fevers.

A suppression of urine is still more dangerous than that of perspiration, and unless relieved in a short time will certainly prove fatal. This disorder, which is called *ischuria*, may arise from various diseases of the kidneys, ureters, bladder, urethra, &c. Thus any obstruction or irritation of one or other of the kidneys or ureters, by a stone, gravel, mucus, blood, inflammations, spasm, suppuration, scirrhus, swellings of the neighbouring parts, &c. may either prevent the urine from being secreted, or may change its nature in such a manner as to prevent it from entering the bladder.

The urine also, after it hath entered the bladder, is there frequently suppressed, by reason of various disorders to which that organ is liable, as an irritation or inflammation, spasm, acrid substances injected, or sympathy with the neighbouring parts; or by reason of the texture of the bladder itself being destroyed, or from a palsy, scirrhus, ulcer, &c. in the bladder. Or, lastly, the urine may be retained in the bladder from a general stupor, as from a disease of the brain, which happens in some fevers, when the patient is neither sensible of the usual stimulus, nor even of one much greater, so that the fibres can scarcely be excited to contraction by any means whatever. This, in fevers, is always a bad sign, and sometimes even mortal.

A suppression of urine for any length of time produces an immense distention of the bladder, oppression, uneasiness, and pain, not only of the part itself,

**THEORY.** itself, but of the surrounding ones, and even of the whole body; a spasm, or insuperable contraction of the sphincter; an inflammation, gangrene, or laceration of the bladder itself; a violent irritation of the whole habit; then a nausea, vomiting, vertigo, general stupor, and an oppression of the whole mass of blood, with a humour of an urinous nature, which at last being poured out into various cavities of the body, especially of the head, soon brings on a deep sleep, convulsions, and death.

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Dysuria.

From the same causes, but acting with less force, proceeds that disease called a *dysuria*, when the urine passes with difficulty and pain, and is frequently red, black, bloody, purulent, mucous and sandy; the reason of all which appearances is very much unknown.—The most frequent complaint, however, in making water, is where the patient has a continual and violent desire of passing his urine, while at the same time only two or three drops can be passed at once, and that not without some pain. This is occasioned, even in healthy people, by some acrid substance taken into the stomach; and is very common to old people who are generally subject to disorders of the kidneys and bladder. It arises also frequently from a stone irritating the bladder, or from an inflammation of it, or its being deprived of its mucus, or this last being somehow or other corrupted; or lastly, from certain diseases or some particular state of the neighbouring parts, as of the uterus, vagina, urethra, prostate gland, &c.

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Strangury.

Akin to the strangury is an incontinence of urine, when the patient's water either comes away against his will, or altogether without his knowledge. This disorder may arise from debility, palsy, an ulcer or wound, or any long-continued and violent irritation of the bladder, especially of its sphincter, as from a stone, a general palsy, or difficult labour injuring the neighbouring parts.—This symptom occurs in a great number of diseases, especially in the hydrocephalus.—Sometimes the urine is expelled with violence, either by reason of universal spasms, or by violent contractions of the muscles of respiration, as in sneezing, laughter, &c.

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Calculi.

Among the disorders incident to the urine we may reckon the production of calculi, which frequently bring on the most excruciating and dangerous diseases.—The urine, besides the water and salts, contains no small share of the glutinous part of the blood already somewhat corrupted, and still inclined to farther corruption. Hence the urine even of the most healthy people deposits a sediment after it has stood for some time; and though none of this sediment is formed in a healthy body, yet if the smallest particle of foreign matter is introduced into the bladder, a crust soon gathers round it, and it is sure to become the basis of a stone, which by degrees grows to a very great size. It is not unlikely, also, that some unknown fault of the fluids may contribute to the production of those calculi, as the stone is well known to be an hereditary disease, and to be born with the patient. Calculous persons also are commonly subject to complaints of the stomach, especially to an acidity of it; and many have received no little relief from alkalescent or alkaline medicines.—From the same causes may calculi be formed in the kidneys, from which proceed

a horrid train of symptoms described in the subsequent part of this treatise.

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Cancer.

The last disorder here to be taken notice of is a disorder of the glands themselves, owing to some kind of obstruction, and is one of the most dreadful diseases incident to human nature. Hence happens a great swelling and surprising hardness, not only without pain, but sometimes even with a diminution of sensation in the part affected; and when the gland is thus affected, it is called a *scirrhus*. Sometimes it remains in this state for a long time; but sooner or later produces the most excruciating torment. By degrees it is infected with a slow and malignant suppuration, degenerating into an horrid ulcer, consuming not only the part itself, but eating away the neighbouring ones, and corrupting the whole body with the most acrid and incurable poison. This disease is called a *cancer*, of which the causes are very little known.

#### SECT. IV. *Of Nosology.*

**NOSOLGY** is the general history or description of diseases, arranged in a systematic order.

The diseases described by medical writers are so extremely numerous, that unless they were arranged according to some regular plan, we should never be able to retain their descriptions, nor remember how they are to be treated.

Different writers have adopted different schemes; but the most useful and satisfactory of all is that which was first proposed by Sydenham.

By this, which is termed the *systematic method*, the histories of diseases, like the subjects of natural history, are arranged into classes, orders, genera, and species.

The classes are marked by certain symptoms and circumstances, which are common to each; the orders all agree in having the same marks with the class to which they belong, together with some additional ones peculiar to the order: the genera have all the marks and circumstances of the class and the order, and besides have some which distinguish the genus; and the species have all the marks and tokens of class, order, and genus, with the still further addition of symptoms or circumstances which give the specific character.

There are people who, probably, have not been at the trouble to make themselves masters of it, and yet pretend to decry the systematic way of arranging the histories of diseases: but if such as have capacity to understand it will take the pains of examining, they will see that this method is more satisfactory than any that has yet been adopted, and tends to establish practice on the most rational foundations; since, by bringing those diseases together which agree in the greater number of circumstances, and demand nearly similar remedies, it shews, that though there may be great variety in the names, there needs not much in the methods of treatment.

This, as hath been already mentioned, is the scheme which Sydenham recommends in the preface to his justly celebrated works, where he insists strongly on the necessity and advantage of “reducing diseases to a certain and determinate species with the same ex-

a c n e l s



THEORY. actness that we see it done by botanic writers in their histories of plants."

Sauvages was the first who attempted to execute this great task. Linnæus, Vogel, Sagar, and Cullen, have since endeavoured to improve his method. Sauvages enumerates 315 genera, Linnæus 326, Vogel 560, Sagar 350, and Cullen 150. The bare inspection of these numbers, it must be acknowledged, shews that physicians are far from being agreed with regard to what constitutes the generic or specific characters of a disease. Nor is it perhaps probable that they ever can agree in this point: The diagnostic symptoms of diseases are not so easily discovered as the stamina or petals of a flower, or the number of teeth or toes in a quadruped. At the same time, as the utility of a systematic arrangement is indisputable, there can be no hesitation in preferring a method chargeable with some defects, to no method at all. To give our readers therefore an idea of the scheme of classing diseases, we shall lay before them the shortest distribution, being that of Dr Cullen. To exhibit the others would be superfluous to the medical reader, who is already acquainted with them, or can at pleasure consult the *Synopsis Nosologie Medicæ* published by the last-mentioned learned professor; and to ordinary readers, the detail would be equally useless and uninteresting. In the subsequent or practical part of this treatise, however, the synonyma of different nosologists will be carefully noted at the beginning of each disease, and referred to their respective classes, orders, &c.

#### CULLEN'S Arrangement.

CLASS I. PYREXIE. A frequent pulse coming on after an horror; considerable heat; many of the functions injured; the strength of the limbs especially diminished.

ORDER I. Febres. Pyrexia without any primary local affection, following the languor, lassitude, and other symptoms of debility.

SECT. I. *Intermittentes*. Fevers arising from the miasma of marshes; with an apyrexia, or at least a very evident remission; but the disease returns constantly, and for the most part with a horror or trembling. There is only one paroxysm in a day.

Genus I. *Tertianæ*. Similar paroxysms at an interval of about 48 hours, coming on at mid-day. A tertian hath either,

- I. An apyrexia interposed;
  1. Varying the duration of the paroxysm.
    - A. The tertian whose paroxysms are not extended beyond 12 hours.
    - B. The tertian with paroxysms extended beyond 12 hours.
  2. Varying in the return of the paroxysms.
    - C. The tertian returning every day with unequal paroxysms alternately similar to one another.
    - D. The tertian returning every third day, with two paroxysms on the same day.
    - E. The tertian returning every day, with two paroxysms on every third day, and only one on the intermediate ones.
    - F. The tertian returning every day, with a notable remission interposed between the odd and the even days, but a less remarkable one between the even and the odd one.
  3. Varying in its symptoms.

G. The tertian accompanied with a disposition to sleep.

H. Accompanied with spasms and convulsive motions.

I. Accompanied with an efflorescence on the skin.

K. With phlegmasia.

4. Varying in being complicated with other diseases.

5. Varying as to its origin.

II. With the interposition only of a remission between the paroxysms.

Genus II. *Quartana*. Similar paroxysms, with an interval of about 72 hours, coming on in the afternoon.

I. With the interposition of an apyrexia.

1. Varying in the type.

A. The quartan with single paroxysms, returning every fourth day, none on the other days.

B. With two paroxysms every fourth day, and none on the other days.

C. With three paroxysms every fourth day, and none on the intermediate days.

D. Of the four days having only the third free from fever, with similar paroxysms every fourth day.

E. The quartan coming on every day, with similar paroxysms every fourth day.

2. Varying in its symptoms.

3. Varying in being complicated with other diseases.

II. With a remission only between the paroxysms.

Genus III. *Quotidianæ*. Similar paroxysms with an interval of about 24 hours, coming on in the morning.

I. With the interposition of an apyrexia.

1. Varies in being solitary.

A. Universal.

B. Partial.

2. Complicated with other diseases.

II. With a remission only between the paroxysms.

SECT. II. *Continuæ*. Fevers without any intermission, and not occasioned by marsh miasmata; attended with exacerbations and remissions, though not very remarkable.

Genus IV. *Synocha*. Great heat; a frequent, strong, and hard pulse; high coloured urine; the functions of the sensorium a little disturbed.

Genus V. *Typhus*. A contagious disease; the heat not greatly above the natural; the pulse small, weak, and for the most part frequent; the urine little changed; the functions of the sensorium very much disturbed, and the strength greatly diminished.

The species are,

I. *Typhus petechialis*. Typhus for the most part with petechiæ.

Varying in degree. 1. Mild typhus. 2. Malignant typhus.

II. *Typhus icterodes*. Typhus with a yellowness of the skin.

Genus VI. *Synochus*. A contagious disease. A fever composed of a synocha and typhus; in the beginning a synocha, but towards the end a typhus.

ORDER II. *Phlegmasiæ*. A synocha fever, with inflammation or topical pain, the internal function of the part being at the same time injured; the blood covered with fize.

Genus VII. *Phlogosis*. Pyrexia; redness, heat, and

THEORY. and painful tension, of some external part.

The species are,

I. Phlogosis (*phlegmone*) of a vivid red colour; a swelling well defined, for the most part elevated to a point, and frequently degenerating into an abscess, with a beating or throbbing pain.

The variations are, 1. In the form. 2. In the situation.

II. Phlogosis (*erythema*) of a reddish colour, vanishing by pressure; of an unequal and creeping circumference, with scarce any swelling; ending in the scaling off of the cuticle, in phlyctenæ, or blisters.

The variations are, 1. In the degree of violence. 2. In the remote cause. 3. In being complicated with other diseases.

The consequences of a phlogosis are, an imposthume, gangrene, sphacelus.

Genus VIII. Ophthalmia. A redness and pain of the eye, with an inability to bear the light; for the most part with an effusion of tears.

The species and varieties of the ophthalmia, are,

I. Idiopathic.

II. Ophthalmia (*of the membranes*), in the tunica adnata, and the membranes lying under it, or the coats of the eye.

A. Varying in the degree of the external inflammation.

B. In the internal coats affected.

2. Ophthalmia (*of the tarsus* or cartilaginous edge) of the eye-lids, with swelling, erosion, and glutinous exudation.

II. Symptomatic.

1. From a disease of the eye itself.

2. From diseases of other parts, or of the whole body.

Genus IX. Phrenitis. Violent pyrexia; pain of the head; redness of the face and eyes; inability to endure the light or any noise; watchfulness; a fierce delirium, or thymomania.

I. Idiopathic.

II. Symptomatic.

Genus X. Cynanche. Pyrexia sometimes inclining to a typhus; difficulty of swallowing and breathing; with a sensation of narrowness in the fauces.

The species are,

I. Cynanche (*tonsillaris*) affecting the mucous membrane of the fauces, but especially the tonsils, with redness and swelling, accompanied with a synocha.

II. Cynanche (*maligna*) affecting the tonsils and mucous membrane of the fauces with swelling, redness, and mucous crusts of a whitish or ash-colour, creeping, and covering ulcers; with a typhous fever and exanthemata.

III. Cynanche (*trachealis*) attended with difficult respiration, noisy and hoarse inspiration, loud cough, without any apparent tumour in the fauces, somewhat difficult deglutition, and a synocha.

IV. The pharyngæa, attended with redness in the bottom of the fauces, very difficult and painful deglutition, respiration sufficiently free, and a synocha.

V. The parotidæa; with great swelling of the parotids and maxillary glands appearing on the outside; the respiration and deglutition but little injured; a synocha, for the most part mild.

Diseases of this genus are symptomatic, either from

external or internal causes.

Genus XI. Pneumonia. Pyrexia, with a pain in some part of the thorax, difficult respiration, and cough. The species are,

1. Peripneumony, with a pulse not always hard, but sometimes soft; an obtuse pain of the breast; the respiration always difficult; sometimes the patient cannot breathe unless in an upright posture; the face swelled, and of a livid colour; the cough for the most part moist, frequently bloody.

1. Simple idiopathic peripneumonies.

Varying in degree.

2. Idiopathic peripneumonies complicated with fever.

3. Symptomatic peripneumonies.

II. Pleurisy, with a hard pulse; for the most part attended with a pungent pain of one side, augmented chiefly during the time of inspiration; an uneasiness when lying on the side; a moist painful cough, dry in the beginning of the disease, afterwards moist, and frequently bloody.

1. Simple idiopathic pleurifies.

2. Pleurifies, complicated (1.) With fever. (2.) With catarrh.

3. Symptomatic pleurifies.

4. False pleurifies.

The consequences of pleurisy are a vomica or empyema.

Genus XIII. Carditis. Pyrexia; pain about the heart; anxiety; difficulty of breathing; cough; unequal pulse; palpitation of the heart, and fainting.

I. Idiopathic.

II. Symptomatic.

Genus XIV. Peritonitis. Pyrexia; pain of the belly, exasperated by an upright posture, without the proper signs of other abdominal phlegmasiæ. If the diagnostics of the following diseases are given, they may be reckoned as so many species of this genus.

I. Peritonitis (*propria*) situated in the peritonæum, properly so called, surrounding the inside of the abdomen.

II. Peritonitis (*omentalis*) in the peritonæum extended through the omentum.

III. Peritonitis (*mesenterica*) in the peritonæum spread through the mesentery.

Genus XV. Gastritis. Pyrexia inclining to a typhus; anxiety; pain and heat of the epigastrium, augmented when any thing is taken into the stomach; an inclination to vomit, and an immediate rejection of every thing swallowed; an hiccup.

I. Idiopathic.

1. From internal causes.

A. Gastritis (*phlegmonodea*) attended with acute pain and violent pyrexia.

2. From external causes.

B. Gastritis (*erysipelatoïsa*), with a less violent fever and pain; an erysipelatous redness appearing on the fauces.

II. Symptomatic.

Genus XVI. Enteritis. Pyrexia of a typhous nature; pungent pain of the belly, stretching and twisting round the navel; vomiting; the belly obstinately bound.

I. Idiopathic.

1. Enteritis (*phlegmonodea*), with acute pain, violent

lent fever, vomiting, and constipation of the belly.

2. Enteritis (*erysipelatoſa*) with leſs acute fever and pain, without vomiting; but accompanied with a diarrhœa.

#### II. Symptomatic.

Genus XVII. Hepatitis. Pyrexia; tenſion and pain of the right hypochoſdrium; ſometimes pungent like that of a pleuriſy, but more frequently obtuſe; a pain reaching to the clavicle and top of the right ſhoulder; a difficulty of lying on the left ſide; dyſpnœa; dry cough, vomiting, and hiccup.

Genus XVIII. Splenitis. Pyrexia; tenſion, heat and ſwelling of the left hypochoſdrium, the pain increaſing by preſſure; without the ſigns of nephritis.

Genus XIX. Nephritis. Pyrexia; pain in the region of the kidney, often following the courſe of the ureter; frequent making of water, either thin and colourleſs, or very red; vomiting; ſtupor of the thigh; with a retraction or pain of the teſticle of the ſame ſide. The ſpecies are,

#### I. Idiopathic. Spontaneous.

#### II. Symptomatic.

Genus XX. Cyſtitis. Pyrexia; pain and ſwelling of the hypoſtaſtrum; frequent and painful making of water, or iſchuria; and tenefmus. The ſpecies are,

#### I. Thoſe ariſing from internal cauſes.

#### II. Thoſe from external cauſes.

Genus XXI. Hyſteritis. Pyrexia; heat, tenſion, ſwelling, and pain, of the hypoſtaſtrum; the os uteri painful when touched; vomiting.

Genus XXII. Rheumatismus. A diſeaſe ariſing from an external and frequently very evident cauſe; pyrexia; pain about the joints, frequently purſuing the courſe of the muſcles; inſeſting the knees and other large joints rather than thoſe of the feet or hands; increaſed by external heat.

The ſpecies are either idiopathic or ſymptomatic. The former varies in ſituation.

#### A. In the muſcles of the loins.

#### B. In the muſcles of the coxendix.

#### C. In the muſcles of the breaſt.

Genus XXIII. Odontalgia; a rheumatism of the jaws from a caries of the teeth.

Genus XXIV. Podagra. An hereditary diſeaſe, ariſing without any evident external cauſe, but for the moſt part preceded by an unuſual affection of the ſtomach; pyrexia; pain of a joint for the moſt part of the great toe of the foot, but certainly inſeſting chiefly the wrisſts and ankles; returning by intervals; and often alternated with affections of the ſtomach and other internal parts.

I. Podagra (*regularis*) with a pretty violent inflammation of the joints remaining for ſome days, and by degrees going off with ſwelling, itching, and deſquamation of the affected part.

II. Podagra (*atonica*) with an atony of the ſtomach, or ſome other internal part; and either without the uſual inflammation of the joints, or only with ſlight and wandering pains; and frequently alternated with dyſpeſia, or other ſymptoms of atony.

III. Podagra (*retrograda*) with the inflammation of the joints ſuddenly receding, and an atony of the ſtomach and other parts immediately following.

IV. Podagra (*aberrans*) with the inflammation of an internal part either preceding or not, and ſuddenly

receding; an inflammation of the joints.

Genus XXV. Arthropoſis. Deep, obtuſe, and long-continued pains of the joints or muſcular parts, frequently following contuſions; with either no ſwelling, or a moderate and diſſuſed one; no phlogoſis; pyrexia, at firſt gentle, afterwards hectic, and at length an impoſthume.

ORDER III. Exanthemata. Contagious diſeaſes; affecting a perſon only once in their life; beginning with fever; after a certain time appear phlogoſes, for the moſt part ſmall and in conſiderable number, and diſperſed over the ſkin.

Genus XXVI. Eryſipelas. A ſynocha of two or three days, for the moſt part attended with drowlineſs, often with a delirium. In ſome part of the ſkin, moſt frequently the face, appears a phlogoſis *erythema*. (G. VII. Sp. 2.) The ſpecies are,

I. Eryſipelas (*veſiculolum*), with erythema, redneſs creeping, occupying a large ſpace, and in ſome parts ending in large bliſters.

II. Eryſipelas (*phlyctenodes*), with an erythema formed of a number of papulæ, chiefly occupying the trunk of the body, ending in phlyctenæ or ſmall bliſters.

The diſeaſe is alſo ſymptomatic.

Genus XXVII. Peltis. An exceedingly contagious typhus, with the higheſt debility. On an uncertain day of the diſeaſe buboes and carbuncles break forth. It is various in degree, but the ſpecies are uncertain.

Genus XXVIII. Variola; a contagious ſynocha, with vomiting, and pain on preſſing the epigaſtrum. On the third day begins, and on the fifth is finiſhed, the eruption of inflammatory puſtules, which ſuppurate in the ſpace of eight days, and at laſt go off in cruſts; frequently leaving depreſſed cicatrices or pock-pits in the ſkin. The ſpecies are,

I. Variola (*diſcreta*) with few, diſtinct, turgid puſtules, having circular baſes; the fever ceaſing immediately after the eruption.

II. Variola (*conſtans*) with numerous, confluent, irregularly ſhaped puſtules, flaccid, and little elevated; the fever remaining after the eruption.

Genus XXIX. Variella. Synocha; papulæ breaking out after a ſhort fever, ſimilar to thoſe of the ſmall-pox, but hardly ever coming to ſuppurate; after a few days going off in ſmall ſcales, but never leaving any mark.

Genus XXX. Rubecula. A contagious ſynocha, with ſneezing, epiphora, and dry hoarſe cough. On the fourth day, or a little later, break forth ſmall, eluſtered, and ſcarce elevated papulæ; after three days going off in very ſmall branny ſcales.

I. Rubecula (*vulgaris*) with very ſmall confluent, corymboſe papulæ, ſcarce riſing above the ſkin.

#### Varying,

1. In the ſymptoms being more ſevere, and the courſe of the diſeaſe leſs regular.

2. In being accompanied with a quinſey.

3. With a putrid diathēſis.

II. Rubecula (*varioloſodes*) with diſtinct papulæ, raised above the ſkin.

Genus XXXI. Miliaria. Synochus with anxiety, frequent ſighing, ſœtid ſweat, and points on the ſkin. On an uncertain day of the diſeaſe, break out red, ſmall, diſtinct papulæ, ſpread over the whole body as well



THEORY. well as the face; the apices of which, after one or two days, become very small, white pustules, remaining for a short time.

Genus XXXII. Scarlatina. A contagious synocha. On the fourth day of the disease the face swells a little; at the same time an universal redness occupies the skin in large spots, at length running together; after three days, going off in branny scales; frequently succeeded by an anasarca. The species are,

I. Scarlatina (*simplex*), not accompanied with cyanache.

II. Scarlatina (*cynanchica*), with an ulcerous cyanache.

Genus XXXIII. Urticaria. An amphemera fever. On the second day of the disease, red spots resembling the stinging of nettles, almost vanishing during the day, but returning in the evening with the fever, and after a few days going off altogether in very small scales.

Genus XXXIV. Pemphigus. A contagious typhus. On the first, second, or third day of the disease, blisters break out in several parts of the body, of the bigness of a bean, remaining for many days, and at last pouring out a thin ichor.

Genus XXXV. Aphtha. Synochus; the tongue somewhat swelled and of a livid colour, as well as the fauces; eschars first appearing in the fauces; but at length occupying the whole internal part of the mouth, of a white colour, sometimes distinct, often running together; quickly growing again when taken off; and remaining for an uncertain time.

The species are, 1. Idiopathic. 2. Symptomatic.

ORDER IV. Hemorrhagix. Pyrexia, with a profusion of blood, without any external violence; the blood drawn from a vein hath the same appearance as in phlegmasix.

Genus XXXVI. Epistaxis. Pain or weight of the head, redness of the face; a profusion of blood from the nose.

I. Idiopathic.

Varying according to the time of life.

1. Epistaxis of young people, with symptoms of an arterious plethora.

2. Epistaxis of old people, with symptoms of a venous plethora.

II. Symptomatic.

1. From internal causes.

2. From external causes.

Genus XXXVII. Hæmoptysis. Redness of the cheeks; a sensation of uneasiness, or pain, and sometimes of heat, in the breast; difficulty of breathing; tickling of the fauces; either a severe or less violent cough, bringing up florid and frequently frothy blood.

The idiopathic species are,

1. Hæmoptysis (*plethorica*), without any external violence, and without being preceded by any cough or suppression of a customary evacuation.

2. Hæmoptysis (*violenta*), from external violence applied.

3. Hæmoptysis (*phthisica*), after a long-continued cough, with leanness and debility.

4. Hæmoptysis (*calculosa*), in which some calculous molecules, for the most part of a calcareous nature, are thrown up.

5. Hæmoptysis (*vicaria*), after the suppression of a customary evacuation.

Besides these, there are a number of symptomatic species mentioned by different authors. The consequence of an hæmoptysis is, a

*Phthisis*. A wasting and debility of the body, with a cough, hectic fever, and for the most part a purulent expectoration. The species are,

I. An incipient phthisis, without any expectoration of pus.

II. A confirmed phthisis, with an expectoration of pus.

Both species vary, 1. As to their remote cause.

2. As to the origin of the purulent matter.

Genus XXXVIII. Hæmorrhoids. Weight and pain of the head; vertigo; pain of the loins; pain of the anus; livid painful tubercles, from which for the most part blood flows out; which sometimes also drops out of the anus, without any apparent tumour. The species are,

1. Hæmorrhoids (*tumens*), external from mariscis.

Varying.

A, Bloody.

B, Mucous.

2. Hæmorrhoids (*procidens*), external from a *procidencia ani*.

3. Hæmorrhoids (*fluens*), internal, without any swelling or *procidencia ani*.

4. Hæmorrhoids (*cæca*), with pain and swelling of the anus, without any profusion of blood.

Genus XXXIX. Menorrhagia. Pains of the back, belly, and loins, like those of child-birth; an unusually copious flux of the menses or blood from the vagina. The species are,

1. Menorrhagia (*rubra*), bloody in women neither with child nor in child-birth.

2. Menorrhagia (*abortus*) bloody in women with child.

3. Menorrhagia (*lochia*) bloody in child-bed women.

4. Menorrhagia (*vitiorum*) bloody from some local disease.

5. Menorrhagia (*alba*) serous, without any local disease, in women not with child.

6. Menorrhagia (*Nabothi*) serous in women with child.

ORDER V. Profluvia. Pyrexia, with an increased secretion, naturally not bloody.

Genus XL. Catarrhus. Pyrexia frequently contagious; an increased excretion of mucus, at least efforts to excrete it.

The species are for the most part symptomatic.

1. From cold.

2. From contagion.

Genus XLI. Dysenteria. Contagious pyrexia, frequent mucous or bloody stools, while the alvine fæces are for the most part retained; gripes; tenesmus.

Varying:

1. Accompanied with worms.

2. With the excretion of small fleshy or sebaceous bodies.

3. With an intermittent fever.

4. Without blood.

5. With a miliary fever.

CLASS II. NEUROSES.—An injury of the sense and motion, without an idiopathic pyrexia or any local affection.

ORDER

ORDER I. Comata.—A diminution of voluntary motion, with sleep, or a deprivation of the senses.

Genus XLII. Apoplexia.—Almost all voluntary motion diminished, with sleep more or less profound; the motion of the heart and arteries remaining.

The idiopathic species are,

1. Apoplexia (*sanguinea*) with symptoms of universal plethora, especially of the head.

2. Apoplexia (*serena*) with a leucoplegmatia over the whole body, especially in old people.

3. Apoplexia (*hydrocephalica*) coming on by degrees; affecting infants, or those below the age of puberty, first with lassitude, a slight fever and pain of the head, then with slowness of the pulse, dilatation of the pupil of the eye, and drowsiness.

4. Apoplexia (*atriliaria*) taking place in those of a melancholic constitution.

5. Apoplexia (*traumatica*) from some external injury mechanically applied to the head.

6. Apoplexia (*venenata*) from powerful sedatives taken internally or applied externally.

7. Apoplexia (*mentalis*) from a passion of the mind.

8. Apoplexia (*cataleptica*) in the contractile muscles, with a mobility of the limbs by external force.

9. Apoplexia (*suffocata*) from some external suffocating power.

The apoplexy is frequently symptomatic.

1. Of an intermitting fever. 2. Continued fever. 3. Phlegmasia. 4. Exanthema. 5. Hysteria. 6. Epilepsy. 7. Podagra. 8. Worms. 9. Ischuria. 10. Scurvy.

Genus XLIII. Paralysis. Only some of the voluntary motions diminished, frequently with sleep.

The idiopathic species are,

1. Paralysis (*partialis*) of some particular muscles only.

2. Paralysis (*hemiplegica*) of one side of the body.

Varying according to the constitution of the body.

a. Hemiplegia in a plethoric habit.

b. In a leucoplegmatic habit.

3. Paralysis (*paraplegica*) of one half of the body taken transversely.

4. Paralysis (*venenata*) from sedative powers applied either internally or externally.

A symptom either of an Asthenia or Palsy is, Tremor; an alternate motion of a limb by frequent strokes and intervals.

The species are, 1. Asthenic. 2. Paralytic. 3. Convulsive.

ORDER II. Adynamia. A diminution of the involuntary motions whether vital or natural.

Genus XLIV. Syncope; a diminution, or even a total stoppage, of the motion of the heart for a little.

I. Idiopathic.

1. Syncope (*cardiaca*), returning frequently without any manifest cause, with violent palpitations of the heart during the intervals.—From a fault of the heart or neighbouring vessels.

2. Syncope (*occasionalis*) arising from some evident cause.—From an affection of the whole system.

II. Symptomatic; or symptoms of diseases either of the whole system, or of other parts besides the heart.

Genus XLV. Dyspepsia. Anorexia, nausea, vomiting, inflation, belching, rumination, cardialgia, gastrodynia, more or fewer of those symptoms at least

concurring; for the most part with a constipation of the belly, and without any other disease either of the stomach itself or of other parts.

I. Idiopathic.

II. Symptomatic.

1. From a disease of the stomach itself.

2. From a disease of other parts, or of the whole body.

Genus XLVI. Hypochondriasis. Dyspepsia with languor, sadness and fear without any adequate causes, in a melancholic temperament.

Genus XLVII. Chlorosis. Dyspepsia, or a desire of something not used as food; a pale or discoloured complexion; the veins not well filled; a soft tumour of the whole body; asthenia; palpitation; suppression of the menses.

ORDER III. Spasmi. Irregular motions of the muscles or muscular fibres.

SECT. I. In the animal functions.

Genus XLVIII. Tetanus;—a spastic rigidity of almost the whole body.

Varying according to the remote cause, as it arises either from something internal, from cold, or from a wound. It varies likewise, from whatever cause it may arise, according to the part of the body affected.

Genus XLIX. Trismus. A spastic rigidity of the lower jaw.—The species are,

1. Trismus (*nascentium*) seizing infants under two months old.

2. Trismus (*traumaticus*) seizing people of all ages either from a wound or cold.

Genus L. Convulsio.—An irregular clonic contraction of the muscles without sleep.

I. Idiopathic.

II. Symptomatic.

Genus LI. Chorea, attacking those who have not yet arrived at puberty, most commonly within the 10th or 14th year, with convulsive motions for the most part of one side in attempting the voluntary motion of the hands and arms, resembling the gesticulations of mountebanks; in walking, rather dragging one of their feet after them than lifting it.

Genus LII. Raphania. A spastic contraction of the joints, with a convulsive agitation, and most violent periodical pain.

Genus LIII. Epilepsia. A convulsion of the muscles, with sleep.

The idiopathic species are,

1. Epilepsia (*cerebralis*) suddenly attacking without any manifest cause, without any sense of uneasiness preceding, excepting perhaps a slight vertigo or scotomia.

2. Epilepsia (*sympathica*) without any manifest cause, but preceded by the sensation of a kind of air rising from a certain part of the body towards the head.

3. Epilepsia (*occasionalis*) arising from a manifest irritation, and ceasing on the removal of that irritation.

Varying according to the difference of the irritating matter. And thus it may arise,

From injuries of the head; pain; worms; poison from the repulsion of the itch, or an effusion of any other acrid humour; from crudities in the stomach; from

THEORY. from passions of the mind; from an immoderate hæmorrhage; or from debility.

SECT. II. *In the vital functions.*

In the action of the heart.

Genus LIV. Palpitation. A violent and irregular motion of the heart.

In the action of the lungs.

Genus LV. Asthma. A difficulty of breathing returning by intervals, with a sense of straitness in the breast, and a noisy respiration with hissing. In the beginning of the paroxysm there is either no cough at all, or coughing is difficult; but towards the end the cough becomes free, frequently with a copious spitting of mucus.—The idiopathic species are,

1. Asthma (*spontaneum*) without any manifest cause or other concomitant disease.

2. Asthma (*exanthematicum*) from the repulsion of the itch or other acrid effusion.

3. Asthma (*plethoricum*) from the suppression of some customary sanguineous evacuation, or from a spontaneous plethora.

Genus LVI. Dyspnoea. A continual difficulty of breathing, without any sense of straitness, but rather of fullness and infarction in the breast; a frequent cough throughout the whole course of the disease.

The idiopathic species are,

1. Dyspnoea, (*catarrhalis*) with a frequent cough, bringing up plenty of viscid mucus.

2. Dyspnoea (*secca*), with a cough for the most part dry.

3. Dyspnoea (*aërea*), increased by the least change of weather.

4. Dyspnoea (*terrea*), bringing up with the cough an earthy or calculous matter.

5. Dyspnoea (*aquosa*), with scanty urine and œdematous feet; without any fluctuation in the breast, or other signs of an hydrothorax.

6. Dyspnoea (*pinguedinosa*), in very fat people.

7. Dyspnoea (*thoracica*), from an injury done to the parts surrounding the thorax, or from some bad conformation of them.

8. Dyspnoea (*extrinseca*), from evident external causes.

The symptomatic species of dyspnoea are symptoms,

1. Of diseases of the heart or large vessels.

2. Of a swelling in the abdomen.

3. Of various diseases.

Genus LVII. Pertussis. A contagious disease; convulsive strangulating cough reiterated with noisy inspiration; frequent vomiting.

SECT. III. *In the natural functions.*

Genus LVIII. Pyrosis. A burning pain in the epigastrium with plenty of aqueous humour, for the most part insipid, but sometimes acrid, belched up.

Genus LIX. Colica. Pain of the belly, especially twitting round the navel; vomiting; a constipation.

The idiopathic species are,

1. Colica (*spasmodica*), with retraction of the navel, and spasms of the abdominal muscles.

Varying, by reason of some symptoms superadded. Hence,

a, Colica, with vomiting of excrements, or of matters injected by the anus.

b, Colica, with inflammation supervening.

2. Colica (*pictonum*), preceded by a sense of weight or uneasiness in the belly, especially about the navel; then comes on the colic pain, at first slight and interrupted, chiefly augmented after meals; at length more severe and almost continual, with pains of the arms and back, at last ending in a palsy.

Varying according to the nature of the remote cause; and hence,

a, From metallic poison.

b, From acids taken inwardly.

c, From cold.

d, From a contusion of the back.

3. Colica (*stercorea*), in people subject to colic-nests.

4. Colica (*accidentalis*), from acrid matter taken inwardly.

5. Colica (*meconialis*), in new-born children from a retention of the meconium.

6. Colica (*callosa*), with a sensation of stricture in some part of the intestines, and frequently of a collection of stasis with some pain before the constricted part; which stasis also passing through the part where the stricture is felt, gradually vanishes; the belly flows, and at last passing only a few liquid feces.

7. Colica (*calculosa*), with a fixed hardness in some part of the abdomen, and calculi sometimes passing by the anus.

Genus LX. Cholera. A vomiting of bilious matter, and likewise a frequent excretion of the same by stool; anxiety; gripes; spasms in the calves of the legs.

I. Idiopathic.

1. Cholera (*spontanea*) arising in a warm season, without any manifest cause.

2. Cholera (*accidentalis*) from acrid matters taken inwardly.

II. Symptomatic.

Genus LXI. Diarrhoea. Frequent stools; the disease not infectious; no primary pyrexia.

I. Idiopathic.

1. Diarrhoea (*crapulosa*), in which the excrements are voided in greater quantity than naturally.

2. Diarrhoea (*biliosa*), in which yellow feces are voided in great quantity.

3. Diarrhoea (*mucosa*), in which either from acrid substances taken inwardly, or from cold, especially applied to the feet, a great quantity of mucus is voided.

4. Diarrhoea (*caliaca*), in which a milky humour of the nature of chyle is passed.

5. Diarrhoea (*lienteria*), in which the aliments are discharged with little alteration soon after eating.

6. Diarrhoea (*hepatirrhœa*), in which a bloody ferrous matter is discharged without pain.

II. Symptomatic.

Genus LXII. Diabetes. A chronic profusion of urine, for the most part preternatural, and in immoderate quantity.

I. Idiopathic.

1. Diabetes (*mellitus*), with urine of the smell, colour, and taste of honey.

2. Diabetes (*insipidus*), with limpid, but not sweet urine.

II. Symptomatic.

Genus LXIII. Hysteria. Rumbling of the bowels;



a sensation as of a globe turning itself in the belly, ascending to the stomach and fauces, and there threatening suffocation; sleep; convulsions; a great quantity of limpid urine; the mind involuntarily fickle and mutable.

The following are by Sauvages reckoned distinct idiopathic species; but, by Dr Cullen, only varieties of the same species.

- A, From a retention of the menses.
- B, From a menorrhagia cruenta.
- C, From a menorrhagia serosa, or fluor albus.
- D, From an obstruction of the viscera.
- E, From a fault of the stomach.
- F, From too great salacity.

Genus LXIV. Hydrophobia. A dislike and horror at any kind of drink, as occasioning a convulsion of the pharynx; induced, for the most part, by the bite of a mad animal. The species are,

I. Hydrophobia (*rabiosa*), with a desire of biting the bystanders, occasioned by the bite of a mad animal.

II. Hydrophobia (*simplex*), without madness, or any desire of biting.

ORDER IV. Vesaniz. Disorders of the judgment, without any pyrexia or coma.

Genus LXV. Amentia; an imbecility of judgment, by which people either do not perceive, or do not remember, the relations of things. The species are,

I. Amentia (*congenita*), continuing from a person's birth.

II. Amentia (*senili*), from the diminution of the perceptions and memory through extreme old age.

III. Amentia (*acquisita*), occurring in people formerly of a sound mind, from evident external causes.

Genus LXVI. Melancholia; a partial madness, without dyspepsia.

Varying according to the different subjects concerning which the person raves; and thus is

1. With an imagination in the patient concerning his body being in a dangerous condition, from slight causes; or that his affairs are in a desperate state.
2. With an imagination concerning a prosperous state of affairs.
3. With violent love, without satyriasis or nymphomania.
4. With a superstitious fear of a future state.
5. With an aversion from motion and all the offices of life.
6. With restlessness, and an impatience of any situation whatever.
7. With a weariness of life.
8. With a deception concerning the nature of the patient's species.

The Doctor reckons that there is no such disease as that called *demonomania*, and that the diseases mentioned by Sauvage under that title are either

1. Species of melancholy or mania; or
  2. Of some disease by the spectators falsely ascribed to the influence of an evil spirit; or
  3. Of a disease entirely feigned; or
  4. Of a disease partly true and partly feigned.
- Genus LXVII. Mania; universal madness.

1. Mania (*mentalis*), arising entirely from passions

of the mind.

2. Mania (*corporea*), from an evident disease of the body.

Varying according to the different disease of the body.

3. Mania (*obscura*), without any passion of mind, or evident disease of the body preceding.

The symptomatic species of mania are,

1. Paraphrolyne from poisons.
2. Paraphrolyne from passion.
3. Paraphrolyne febrilis.

Genus LXVIII. Oneirodynia. A violent and troublesome imagination in time of sleep.

1. Oneirodynia (*activa*), exciting to waking and various motions.

2. Oneirodynia (*gravans*), from a sense of some weight incumbent, and pressing on the breast especially.

CLASS III. Cachexiæ; a depraved habit of the whole or greatest part of the body, without primary pyrexia or neurosis.

ORDER I. Marcures; a wasting of the whole body.

Genus LXIX. Tabes. Leanness, asthenia, hectic pyrexia. The species are,

1. Tabes (*purulenta*), from an external or internal ulcer, or from a vomica.

Varying in its situation; hence,

2. Tabes (*scrophulosa*), in scrophulous constitutions.
3. Tabes (*venenata*), from poison taken inwardly.

Genus LXX. Atrophia. Leanness and asthenia, without hectic pyrexia. The species are,

1. Atrophia (*inanitorum*), from too great evacuation.

1. Atrophia (*famelicorum*), from a deficiency of nourishment.

3. Atrophia (*cachochymica*), from corrupted nourishment.

4. Atrophia (*debilium*), from the function of nutrition being depraved, without any extraordinary evacuation or cachochymia having preceded.

ORDER II. Intumescencie. An external tumour of the whole or greatest part of the body.

SECT. I. Adiposæ.

Genus LXXI. Polysarcia; a troublesome swelling of the body from fat.

SECT. II. Flatuscæ.

Genus LXXII. Pneumatosis; a tense elastic swelling of the body, crackling under the hand. The species are,

1. Pneumatosis (*spontanea*), without any manifest cause.
2. Pneumatosis (*traumatica*), from a wound in the breast.
3. Pneumatosis (*venenata*), from poison injected or applied.
4. Pneumatosis (*hysterica*), with hysteria.

Genus LXXIII. Tympanites; a tense, elastic, sonorous swelling of the abdomen; coliciveness; a decay of the other parts. The species are,

1. Tympanites (*intestinalis*), with a tumour of the abdomen frequently unequal, and with a frequent evacuation of air relieving the tension and pain.

THEORY. 2. Tympanites (*abdominalis*), with a more evident noise, a more equable tumour, and a less frequent emission of flatus, which also gives less relief.

Genus LXXIV. Phyfometra; a slight elastic swelling in the epigastrium, having the figure and situation of the uterus.

SECT. III. Aquofe or Hydropes.

Genus LXXV. Anafarca. A soft, inelastic swelling of the whole body, or some part of it. The species are,

1. Anafarca (*ferofa*) from a retention of serum on account of the fuppreffion of the ufual evacuations, or from an increafe of the serum on account of too great a quantity of water taken inwardly.

2. Anafarca (*oppilata*) from a compreffion of the veins.

3. Anafarca (*exanthematica*) arifing after exanthemata, efpecially after the eryfipelas.

4. Anafarca (*anæmia*) from the thinnefs of the blood produced by hæmorrhage.

5. Anafarca (*debiliùm*) in weak people after long difeafes, or from other caufes.

Genus LXXVI. Hydrocephalus. A soft inelastic swelling of the head, with the fures of the cranium opened.

Genus LXXVII. Hydrorachitis. A soft, fender tumour above the vertebræ of the loins; the vertebræ gaping from each other.

Genus LXXVIII. Hydrothorax. Dyfpnœa; pale- nefs of the face; oedematous fwellings of the feet; fcanty urine; lying down difficult; a fudden and fpontaneous waking out of fleep, with palpitatio; water fluctuating in the breaft.

Genus LXXIX. Afцитес. A tenfe, fcarce elastic, but fluctuating fwelling of the abdomen. The fpecies are,

1. Afцитес (*abdominalis*), with an equal fwelling of the whole abdomen, and with a fluctuation fufficiently evident.

Varying according to the caufe.

A. From an obftruction of the vifcera.

B. From debility.

C. From a thinnefs of the blood.

2. Afцитес (*faccatus*), with a fwelling of the abdomen, in the beginning at leaft, partial, and with a lefs evident fluctuation.

Genus LXXX. Hydrometra. A fwelling of the hypogaftrium in women, gradually increafing, keeping the fhape of the uterus, yielding to preffure, and fluctuating; without ifchuria or pregnancy.

Genus LXXXI. Hydrocele. A fwelling of the fcrotum, not painful; increafing by degrees, foft, fluctuating, and pellucid.

SECT. IV. Solide.

Genus LXXXII. Phyfconia. A fwelling chiefly occupying a certain part of the abdomen, gradually increafing, and neither fonorous nor fluctuating. The fpecies are,

Phyfconia hepatica.

Phyfconia fplenica.

Phyfconia renalis.

Phyfconia uterina.

Phyfconia ab ovario.

Phyfconia mefenterica.

Phyfconia intestinalis.

Phyfconia omentalis.

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Phyfconia polyfplachna.

Phyfconia vifceralis.

Phyfconia externa lupialis.

Phyfconia externa fcirrhouea.

Phyfconia externa hydatidofa.

Phyfconia ab adipe fubcutaneo.

Phyfconia ab excreffcentia.

Genus LXXXIII. Rachitis. A large head, fwelling moft in the forepart; the ribs depreffed; abdomena fwelled, with a decay of the other parts.

Varying.

1. Simple, without any other difeafe.

2. Joined with other difeafes.

ORDER III. Impetigines. Cachexies chiefly deforming the fkin and external parts of the body.

Genus LXXXIV. Scrophula. Swellings of the conglobate glands, efpecially in the neck; fwelling of the upper lip and fupport of the nofe; the face florid, fkin thin, abdomen fwelled. The fpecies are,

1. Scrophula (*vulgaris*), fimple, external, and permanent.

2. Scrophula (*meferenterica*), fimple, internal, with palenefs of the face, want of appetite, fwelling of the abdomen, and unfual factor of the excrements.

3. Scrophula (*fugax*), moft fimple, appearing only about the neck; for the moft part proceeding from the reforption of the matter of ulcers in the head.

4. Scrophula (*Americana*), joined with the yaws.

Genus LXXXV. Syphilis. A contagious difeafe, after impure venery, and a diforder of the genitals; ulcers of the tonfils; of the fkin, efpecially about the margin of the hair; corymbofe papulæ, ending in cruffs and cruffy ulcers; pains of the bones; exoftofes.

Genus LXXXVI. Scorbutus; in cold countries, attacking after putrefcent diet, efpecially fuch as is falt and of the animal-kind, where no fupply of freff vegetables is to be had; afthenia; ftomacace; fspots of different colours on the fkin, for the moft part livid, and appearing chiefly among the roots of the hair.

Varying in degree.

a, Scorbutus incipiens.

b, Scorbutus crefcens.

c, Scorbutus inveteratus.

Varying alfo in its fymptoms.

d, Scorbutus lividus.

e, Scorbutus petechialis.

f, Scorbutus pallidus.

g, Scorbutus ruber.

h, Scorbutus calidus.

Genus LXXXVII. Elephantiafis; a contagious difeafe; thick, wrinkled, rough, unctuous fkin, deftitute of hairs, anæfthefia in the extremities, the face deformed with pimples, the voice hoarfe and nasal.

Genus LXXXVIII. Lepra; the fkin rough, with white, branny, and chopped efchars, fometimes moift beneath, with itching.

Genus LXXXIX. Framboëfia; fwellings refembling fungi, or the fruit of the mulberry or rafpberry, growing on various parts of the fkin.

Genus XC. Trichoma; a contagious difeafe; the hairs thicker than ufual, and twifted into inextricable knots and cords.

Genus XCI. Icterus; yellownefs of the fkin and eyes;

THEORY. eyes; white fæces; urine of a dark red, tinging what is put into it of a clay colour.

The idiopathic species are,

1. Icterus (*calculifus*), with acute pain in the epigastric region, increasing after meals; biliary concretions voided by stool.

2. Icterus (*spasmodicus*), without pain, after spasmodic diseases and passions of the mind.

3. Icterus (*hepaticus*), without pain, after diseases of the liver.

4. Icterus (*gravidarum*), arising during the time of pregnancy, and going off after delivery.

5. Icterus (*infantum*), coming on in infants a few days after birth.

CLASS IV. LOCALES. An affection of some part, but not of the whole body.

ORDER I. Dysæthæsiæ. The senses depraved or destroyed, from a disease of the external organs.

Genus XCII. Caligo. The sight impaired or totally destroyed, on account of some opaque substance interposed between the objects and the retina, inherent in the eye itself or the eye-lids. The species are,

1. Caligo (*lenticis*), occasioned by an opaque spot behind the pupil.

2. Caligo (*corneæ*), from an opacity of the cornea.

3. Caligo (*pupillæ*), from an obstruction of the pupil.

Varying according to the different causes from which it proceeds.

4. Caligo (*humorum*), from a disease or defect of the aqueous humour.

Varying according to the different state of the humour.

5. Caligo (*palpebrarum*) from a disease inherent in the eye-lids.

Varying according to the nature of the disease in the eye-lids.

Genus XCIII. Amaurosis. The sight diminished, or totally abolished, without any evident disease of the eye; the pupil for the most part remaining dilated and immovable. The species are,

1. Amaurosis (*compressionis*), after the causes and attended with the symptoms of congestion in the brain. Varying according to the nature of the remote cause.

2. Amaurosis (*atonica*), after the causes and accompanied with symptoms of debility.

3. Amaurosis (*spasmodica*), after the causes and with the signs of spasm.

4. Amaurosis (*venenata*), from poison taken into the body or applied outwardly to it.

Genus XCIV. Dylopia. A deprivation of the sight, so that objects cannot be distinctly perceived except at a certain distance and in a certain situation. The species are,

1. Dylopia (*tenebrarum*), in which objects are not seen unless they are placed in a strong light.

2. Dylopia (*luminis*), in which objects are not distinctly seen unless by a weak light.

4. Dylopia (*distorum*), in which distant objects are not perceived.

4. Dylopia (*proximorum*), in which the nearest objects are not perceived.

5. Dylopia (*lateralis*), in which objects are not perceived unless placed in an oblique posture.

Genus XCV. Plendoblepsia; when the sight is diminished in such a manner that the person imagines he sees things which really do not exist, or sees things which do exist after some other manner than they really are. The species are,

1. Pseudoblepsia (*imaginaria*), in which the person imagines he sees things which really do not exist.

Varying according to the nature of the imagination.

2. Pseudoblepsia (*mutans*), in which objects really existing appear somehow changed.

Varying according to the change perceived in the objects, and according to the remote cause.

Genus XCVI. Dysecœa. A diminution or total abolition of the sense of hearing. The species are,

1. Dysecœa (*organica*), from a disease in the organs transmitting sounds to the internal ear.

Varying according to the nature of the disease and of the part affected.

2. Dysecœa (*atonica*), without any evident disease of the organs transmitting the sounds.

Varying according to the nature of the cause.

Genus XCVII. Paracusis; a deprivation of the hearing. The species are,

1. Paracusis (*imperfecta*), in which though sounds coming from external objects are heard, yet it is neither distinctly nor in the usual manner.

Varying,

a, With a dulness of hearing.

b, With an hearing too acute and sensible.

c, When a single external sound is doubled by some internal causes.

d, When the sounds which a person desires to hear are not perceived, unless some other violent sound is raised at the same time.

2. Paracusis (*imaginaria*), in which sounds not existing externally are excited from internal causes.

Varying according to the nature of the sound perceived, and according to the nature of the remote cause.

Genus XCVIII. Anosmia; a diminution or abolition of the sense of smell. The species are,

1. Anosmia (*organica*), from a disease in the membrane lining the internal parts of the nostrils.

Varying according to the nature of the disease.

2. Anosmia (*atonica*), without any evident disease of the membrane of the nose.

Genus XCIX. Agheusia; a diminution or abolition of the sense of taste.

1. Agheusia (*organica*), from a disease in the membrane of the tongue, keeping off from the nerves those substances which ought to produce taste.

2. Agheusia (*atonica*), without any evident disease of the tongue.

Genus C. Anæsthesia; a diminution or abolition of the sense of feeling. The species from Sauvages, adopted by Dr Cullen, are,

1. Anæsthesia a spina bifida.

2. Anæsthesia plethorica.

3. Anæsthesia nascentium.

4. Anæsthesia melancholica.

ORDER II. Dyforexia; error or defect of appetite.

SECT. I. Appetitus erronei.

Genus CI. Bulimia; a desire for food in greater quantities than can be digested.

The idiopathic species are,

1. Buli-



1. Bulimia (*helluonum*), an unusual appetite for food, without any disease of the stomach.

2. Bulimia (*syncopalis*), a frequent desire of meat on account of a sensation of hunger threatening syncope.

3. Bulimia (*emetica*), an appetite for a great quantity of meat, which is thrown up immediately after it is taken.

Genus CII. Polydipsia; an appetite for an unusual quantity of drink.

The polydipsia is almost always symptomatic, and varies only according to the nature of the disease which accompanies it.

Genus CIII. Pica; a desire of swallowing substances not used as food.

Genus CIV. Satyriasis; an unbounded desire of venery in men. The species are,

1. Satyriasis (*juvenilis*), an unbounded desire of venery, the body at the same time being little disordered.

2. Satyriasis (*furens*), a vehement desire of venery, with a great disorder of the body at the same time.

Genus CV. Nymphomania; an unbounded desire of venery in women.

Varying in degree.

Genus CVI. Nostalgia; a violent desire in those who are absent from their country of revisiting it.

1. Nostalgia (*simplex*), without any other disease.

2. Nostalgia (*complicata*), accompanied with other diseases.

SECT. II. Appetitus deficientes.

Genus CVII. Anorexia. Want of appetite for food. Always symptomatic.

1. Anorexia (*humoralis*), from some humour loading the stomach.

2. Anorexia (*atonica*), from the tone of the fibres of the stomach being lost.

Genus CVIII. Adipsia; a want of thirst. Always a symptom of some disease affecting the sensorium commune.

Genus CIX. Anaphrodisia; want of desire for, or impotence to venery.

The true species are,

1. Anaphrodisia paralytica.

2. Anaphrodisia gonorrhoeica.

The false ones are,

1. Anaphrodisia a mariscis.

2. Anaphrodisia ab urethrae vitio.

ORDER III. Dyscinæsiæ. An impediment, or deprivation of motion from a disorder of the organs.

Genus CX. Aphonia; a total suppression of voice without coma or syncope. The species are,

1. Aphonia (*gutturælis*), from the fauces or glottis being swelled.

2. Aphonia (*trachealis*), from a compression of the trachea.

3. Aphonia (*atonica*), from the nerves of the larynx being cut.

Genus CXI. Mutitas; a want of power to pronounce words. The species are,

1. Mutitas (*organica*), from the tongue being cut out or destroyed.

2. Mutitas (*atonica*), from injuries done to the nerves of the tongue.

3. Mutitas (*stupidum*), from people being born

deaf, or the hearing being destroyed during childhood.

Genus CXII. Paraphonia; a depraved sound of the voice. The species are,

1. Paraphonia (*puberum*), in which, about the time of puberty, the voice, from being acute and sweet, becomes more grave and harsh.

2. Paraphonia (*rauca*), in which, by reason of the dryness or flaccid tumour of the fauces, the voice becomes rough and hoarse.

3. Paraphonia (*resonans*), in which, by reason of an obstruction in the nostrils, the voice becomes hoarse, with a sound hissing through the nostrils.

4. Paraphonia (*palatina*), in which, on account of a defect or division of the uvula, for the most part with an hare-lip, the voice becomes obscure, hoarse, and unpleasant.

5. Paraphonia (*clangens*), in which the voice is changed to one acute, shrill, and small.

6. Paraphonia (*comatosa*), in which, from a relaxation of the velum palati and glottis, a sound is produced during inspiration.

Genus CXIII. Pselismus; a defect in the articulation of words. The species are,

1. Pselismus (*laxans*), in which the words, especially the first ones of a discourse, are not easily pronounced, and not without a frequent repetition of the first syllable.

2. Pselismus (*ringens*), in which the sound of the letter R is always aspirated, and, as it were, doubled.

3. Pselismus (*lallans*), in which the sound of the letter L becomes more liquid, or is pronounced instead of R.

4. Pselismus (*emolliens*), in which the hard letters are changed into the softer ones, and thus the letter S is much used.

5. Pselismus (*balbutiens*), in which, by reason of the tongue being large or swelled, the labial letters are better heard, and often pronounced instead of others.

6. Pselismus (*acheilos*), in which the labial letters cannot be pronounced at all, or with difficulty.

7. Pselismus (*logostomatum*), in which, on account of the division of the palate, the guttural letters are less perfectly pronounced.

Genus CXIV. Strabismus; the optic axes of the eyes not converging. The species are,

1. Strabismus (*habitualis*), from a bad custom of using only one eye.

2. Strabismus (*commodus*), from the greater debility or mobility of one eye above the other; so that both eyes cannot be conveniently used.

3. Strabismus (*necessarius*), from a change in the situation or shape of the parts of the eye.

Genus CXV. Contractura; a long-continued and rigid contraction of one or more limbs. The species are,

1. Contractura (*primaria*), from the muscles becoming contracted and rigid.

a. From the muscles becoming rigid by inflammation.

b. From muscles become rigid by spasm.

c. From muscles contracted by reason of their antagonists having become paralytic.

d, From muscles contracted by an irritating acrimony.

e, *Contractura (articularis)*, from stiff joints.

ORDER IV. Apocrenoses. A flux either of blood or some other humour flowing more plentifully than usual, without pyrexia, or an increased impulse of fluids.

Genus CXVI. *Profusus*, a flux of blood.

Genus CXVII. *Ephidrosis*, a preternatural evacuation of sweat.

Symptomatic ephidroses vary according to the nature of the diseases which they accompany, the different nature of the sweat itself, and sometimes the different parts of the body which sweats most.

Genus CXVIII. *Epiphora*, a flux of the lacrymal humour.

Genus CXIX. *Ptyalismus*, a flux of saliva.

Genus CXX. *Enuresis*, an involuntary flux of urine without pain. The species are,

1. *Enuresis (atonica)*, after diseases injuring the sphincter of the bladder.

2. *Enuresis (irritata)*, from a compression or irritation of the bladder.

Genus CXXI. *Gonorrhœa*, a preternatural flux of humour from the urethra in men, with or without a desire of venery. The species are,

1. *Gonorrhœa (pura)*, in which, without any impure venery having preceded, a humour resembling pus, without dysuria or propensity to venery, flows from the urethra.

2. *Gonorrhœa (impura)*, in which, after impure venery, an humour like pus flows from the urethra with dysuria. The consequence of this is,

*Gonorrhœa (mucosa)*, in which, after an impure gonorrhœa, a mucus humour flows from the urethra with little or no dysuria.

3. *Gonorrhœa (laxorum)*, in which an humour for the most part pellucid, without any erection of the penis, but with a propensity to venery, flows from the urethra while the person is awake.

4. *Gonorrhœa (dormientium)*, in which the seminal liquor is thrown out, with erection and desire of venery, in those who are asleep and have lascivious dreams.

ORDER V. *Epiischemes*, suppressions of evacuations.

Genus CXXII. *Obtupatio*; the stools either suppressed, or slower than usual. The species are,

1. *Obtupatio (debilium)*, in lax, weak, and for the most part dyspeptic persons.

2. *Obtupatio (rigidorum)*, in people whose fibres are rigid, and frequently of an hypochondriac disposition.

3. *Obtupatio (obstructorum)*, with symptoms of the colica 1st, 2d, 4th, and 7th, above-mentioned.

Genus CXXIII. *Iscuria*, an absolute suppression of urine. The species are,

1. *Iscuria (renalis)*, coming after a disease of the kidneys, with pain, or troublesome sense of weight in the region of the kidneys, and without any swelling of the hypogastrium, or desire of making water.

2. *Iscuria (ureterica)*, coming after a disease of the kidneys, with a sense of pain or uneasiness in some part of the ureter, and without any tumour of the hypogastrium, or desire of making water.

3. *Iscuria (vesicalis)*, with a swelling of the hypogastrium, pain at the neck of the bladder, and a frequent stimulus to make water.

4. *Iscuria (urethralis)*, with a swelling of the hypogastrium, frequent stimulus to make water, and pain in some part of the urethra.

All these species are subdivided into many varieties, according to their different causes.

Genus CXXIV. *Dysuria*, a painful, and somehow impeded emission of urine. The species are,

1. *Dysuria (ardens)*, with heat of water, without any manifest disorder of the bladder.

2. *Dysuria (spasmodica)*, from a spasm communicated from other parts to the bladder.

3. *Dysuria (compressiva)*, from the neighbouring parts pressing upon the bladder.

4. *Dysuria (phlogistica)*, from an inflammation of the neighbouring parts.

5. *Dysuria (irritata)*, with signs of a stone in the bladder.

6. *Dysuria (mucosa)*, with a copious excretion of mucus.

Genus CXXV. *Dyspermatismus*, a slow, impeded, and insufficient emission of semen in the venereal act. The species are,

1. *Dyspermatismus (urethralis)*, from diseases of the urethra.

2. *Dyspermatismus (nodosus)*, from knots on the cavernous bodies.

3. *Dyspermatismus (preputialis)*, from too narrow an orifice of the prepuce.

4. *Dyspermatismus (mucosus)*, from mucus infarcting the urethra.

5. *Dyspermatismus (hypertonicus)*, from too strong an erection of the penis.

6. *Dyspermatismus (epilepticus)*, from a spasmodic epilepsy happening during the time of coition.

7. *Dyspermatismus (apradodes)*, from an imbecility of the parts of generation.

8. *Dyspermatismus (refluxus)*, in which there is no emission of semen, because it returns from the urethra into the bladder.

Genus CXXVI. *Amenorrhœa*. The menses either flowing more sparingly than usual, or not at all, at their usual time, without pregnancy. The species are,

1. *Amenorrhœa (emarginis)*, in those arrived at puberty, in whom, after the usual time, the menses have not yet made their appearance, and many different morbid affections have taken place.

2. *Amenorrhœa (suppressionis)* in adults, in whom the menses which had already begun to flow are suppressed.

3. *Amenorrhœa (difficilis)*, in which the menses flow sparingly and with difficulty.

ORDER VI. Tumores; an increased magnitude of any part without phlogosis.

Genus CXXVII. *Aneurisma*, a soft tumour, with pulsation, above an artery.

Genus CXXVIII. *Varix*, a soft tumour, without pulsation, above a vein.

Genus CXXIX. *Echymoma*, a diffused, and scarce eminent, livid tumour.

Genus CXXX. *Scirrhus*, an hard tumour of some part, generally of a gland, without pain, and difficultly brought to suppuration.

Genus CXXXI. *Cancer*. A painful tumour of a scirrhous nature, and degenerating into an ill-conditioned ulcer.

- THEORY. Genus CXXXII. Bubo; a suppurating tumour of a conglobate gland.
- Genus CXXXIII. Sarcoma; a soft swelling, without pain.
- Genus CXXXIV. Verruca; a harder scabrous swelling.
- Genus CXXXV. Clavus; a hard, lamellated thickens of the skin.
- Genus CXXXVI. Lupia. A moveable, soft tumour below the skin, without pain.
- Genus CXXXVII. Ganglion. An harder, moveable swelling, adhering to a tendon.
- Genus CXXXVIII. Hydatid; a cuticular vesicle filled with aqueous humour.
- Genus CXXXIX. Hydrarthrus; a most painful swelling of the joints, chiefly of the knee, at first scarce elevated, of the same colour with the skin, diminishing the mobility.
- Genus CXL. Exostosis; a hard tumour adhering to a bone.
- ORDER VII. Ectopix; tumours occasioned by the removal of some part out of its proper situation.
- Genus CXLI. Hernia; an ectopia of a soft part as

yet covered with the skin and other integuments.

Genus CXLII. Prolapsus; a bare ectopia of some soft part.

Genus CXLIII. Luxatio; the removal of a bone from its place in the joints.

ORDER VIII. Dialyses. A solution of continuity, manifest to the sight or touch.

Genus CXLIV. Vulnus; a recent and bloody solution of the unity of some soft part by the motion of some hard body.

Genus CXLV. Ulcus. A purulent or ichorous solution of a soft part.

Genus CXLVI. Herpes; a great number of phlyctenæ or small ulcers, gathering in clusters, creeping, and obstinate.

Genus CXLVII. Tinea; small ulcers among the roots of the hair of the head, pouring out a humour which changes to a white friable scurf.

Genus CXLVIII. Pfora. Itchy pustules and little ulcers of an infectious nature, infesting the hands.

Genus CXLIX. Fractura; bones broken into large fragments.

Genus CL. Caries; an exulceration of a bone.

## PART II. PRACTICE OF MEDICINE; or the DESCRIPTION and CURE of most *Diseases* incident to Human Nature, arranged according to Dr CULLEN's NOSOLOGY.

SAUVAGES, as has been already observed, was the first who attempted to arrange diseases according to the plan suggested by Sydenham; and his Work still continues the only one that merits the title of *Methodical Nosology*. For though Linnæus, Vogel, Cullen, and Sagar, have successively endeavoured to improve his method of classification, they have contented themselves with an enumeration and arrangement of the different genera, without entering into their history and cure: so that, though we have since had various *Schemes of Arrangement*, we have had, properly speaking, no complete *System of Nosology*; that is, no complete Course of Medicine according to any of these arrangements. Presuming, therefore, that a Practice formed upon the most approved Classification, in imitation of the work of Sauvages, might be esteemed an acquisition by our medical readers, we have endeavoured to execute that task in the present part of this treatise: Wherein the Practice is modelled by the arrangement of Dr Cullen; and the outline is filled up from the best authors, so as to exhibit the most approved methods of treatment, with the latest discoveries and improvements in the healing art.

### CLASS I. PYREXIÆ, (the Febrile Diseases of other Authors.)

#### ORDER I. FEBRES.

*Sauvages*. Clafs II. *Vog.* Clafs I. *Sagar*. Clafs XII. *Morbi Febriles Critici*, *Lin.* Clafs II.

#### SECT. I. INTERMITTENTS.

*Intermittentes* of some authors; *Sauv.* Clafs II. Or-

der III. *Lin.* Clafs II. Order II. *Vog.* Clafs I. Order I. *Sag.* Clafs XII. Order III.

The *remittentes* of others, *Sauv.* Clafs II. Order II. *Sag.* Clafs XII. Order II.

*Exacerbantes*, *Lin.* Clafs II. Order III.

*Continuæ*, *Vog.* Clafs I. Order II.

GENUS I. TERTIANA; the TERTIAN FEVER. (*Tertiana*, *Sauv.* G. 88. *Lin.* 16. *Hoffm.* *Stahl.* *Cleg-*horn. *Senac.*)

#### I. The Genuine TERTIAN.

(*Tertiana legitima*, *Senert. Hoffm.* *Clegborn*, Minorc. *Sauv.* Sp. I.)

1. *Description.* This disease comes on in the morning, or from breakfast to dinner-time. It begins with a remarkable shivering, increasing frequently to a kind of convulsive shaking of the limbs. The extremities are always cold, sometimes remarkably so. The cold for the most part is first perceived about the lumbar regions, and from thence ascending along the spine turns towards the pit of the stomach. Sometimes it begins in the first joint of the fingers and tip of the nose. Sometimes attacks only a particular part of the body, as one of the arms, the side of the head, &c. This cold is preceded by a heavy and sleepy torpor, languor and lassitude, which we are partly to ascribe to real weakness, and partly to mere laziness. To these symptoms succeed yawning and stretching; after which the cold comes on as above described, not unfrequently with a pain of the back, and a troublesome sensation of tension in the precordia and hypochondria. To this succeed nausea and vomiting; and the more genuine the disease, the more certainly does

the



the vomiting come on, by which a great deal of tough mucous matter, and sometimes bilious stuff or indigested food, is evacuated during the first paroxysms. In some there is only a violent straining to vomit, without bringing up any thing: sometimes, instead of these symptoms, a diarrhoea occurs; and this chiefly in weak, phlegmatic, and aged people, or where an indigested mucous saburra has long remained in the prime vie.

When these symptoms have continued for an hour or two, the cold begins to go off, and is succeeded by a lassitude, languor, and flaccidity of the whole body, but chiefly in the limbs, with an uneasy soreness as if the parts had been bruised; excepting in those cases where the nausea continues for a longer time. After this languor a heat comes on, the increase of which is generally slow, but sometimes otherwise, with pain of the head, thirst, and bitterness in the mouth. The pulse is quick and unequal; sometimes beating 130 strokes in a minute. As soon as this heat hath abated, a little moisture or sweat is observed to break forth; not always indeed in the first, but always in the succeeding paroxysms, and the urine lets fall a quantity lateritious sediment. The whole paroxysm is scarce ever over in less than six hours, more frequently eight, and in violent cases extends to 12 hours; but that which exceeds 12 hours is to be reckoned a spurious kind, and approaching to the nature of continued fevers. All these symptoms, however, are repeated every third day, in such a manner that the patient is quite free from fever for at least 24 hours. The paroxysms return much about the same time, though sometimes a little sooner or later.

3. *Causes of this disease, and persons subject to it.* The genuine tertian attacks men rather than women, young people rather than old; the latter being more subject to anomalous tertians. It likewise seizes the lusty and active, rather than the lazy and indolent. Those, however, who are very sensible and apt to nauseate their meat, fall easily into a tertian fever. The cause, according to Dr Cullen, is the miasma of marshes, and that only. Other physicians have taken in many more causes, almost every thing indeed which debilitates the body: but the Doctor denies that any of these, though they may dispose the body for receiving the disease, or may augment it, can by any means produce it without the concurrence of the marsh miasma.

3. *Prognosis.* The genuine simple tertian, unless improper medicines are administered, is generally very easily cured; nay, the vulgar reckon it of such a salutary nature, that after it they imagine a person becomes more strong and healthy than before. Hippocrates hath justly observed, that these fevers terminate of their own accord after seven or nine paroxysms. Juncker tells us, that it frequently terminates before the seventh paroxysm, but rarely before the fourth. He also denies that any thing critical is to be observed in its going off; but in this he differs from Vogel, who tells us, that the urine, for some days after the fever is quite gone off, appears slimy, and lets fall much sediment. The latter also informs us, that besides the common crisis by sweat and urine, the tertian hath one peculiar to itself, namely, dry scabby ulcers breaking out upon the lips. These sometimes appear about the

the third or fourth paroxysm; and then we may venture to foretel that the disease will go off spontaneously after the seventh. But though the disease is never dangerous, in cold climates at least, when properly treated; yet the improper use of hot and stimulating medicines may change it into a continued fever, more or less dangerous according to the quantity of medicines taken and the constitution of the patient; in which case the prognosis must be regulated by the particular symptoms which occur.

*Cure.* The treatment of all genuine intermittents, whether tertians, quotidian, or quartans, being precisely the same, the general method of cure applicable to them all may be here given, to which it will be easy to refer when we come to describe the others.

In treating intermittent fevers, physicians have formed indications of cure according to their different theories. The followers of Boerhaave, Stahl, &c. who imagined that the disease proceeded from a lentor or other disorder in the blood and juices, always thought it necessary to correct and evacuate these peccant humours by emetics and purgatives before they attempted to stop the disease by the bark or any other medicine. The bark indeed seems to be held in very little estimation by them; since Vogel affirms, that this medicine, instead of deservng to have the preference of all other febrifuge medicines, ought rather to be ranked among the lowest of the whole; and for this reason he ascribes the cures hereafter mentioned, by the external application of the bark, entirely to nature.

According to Dr Cullen, the indications of cure in intermittent fevers may be reduced to the following.

1. In the time of intermission, to prevent the return of the paroxysms.
2. In the time of paroxysms, to conduct these in such a manner as to obtain a final solution of the disease.
3. To take off certain circumstances which might prevent the fulfilling of the two first indications.

The first indication may be answered in two ways.

1. By increasing the action of the heart and arteries some time before the period of accession, and supporting that increased action till the period of accession be over, and thus to prevent the recurrence of that atony and spasm of the extreme vessels which give occasion to the recurrence of paroxysms.
2. By supporting the tone of the vessels, and thereby preventing atony and the consequent spasm, without increasing the action of the heart and arteries, the recurrence of paroxysms may be prevented.

The action of the heart and arteries may be increased, 1. By various stimulant remedies internally given or externally applied, and that without exciting sweat. 2. By the same remedies, or others, managed in such a manner as to excite sweating, and to support that sweating till the period of accession be for some time past. 3. By emetics, supporting for the same time the tone and action of the extreme vessels.

The tone of the extreme vessels may be supported without increasing the action of the heart and arteries, by various tonic medicines; as, 1. Astringents alone. 2. Bitters alone. 3. Astringents and bitters conjoined. 4. Astringents and aromatics conjoined. 5. Certain metallic tonics; and, 6. Opiates. A good deal

of exercise, and as full a diet as the condition of the patient's appetite and digestion may allow of, will be proper during the time of intermission, and may be considered as belonging to this head.

Of all the tonic remedies mentioned, the most celebrated, and perhaps the most certainly effectual, is the Peruvian bark: but it must be observed, that good effects are only to be expected from this medicine when given in substance and in large quantity; and for its use the following rules or observations have been given.

1. The bark may with safety be employed at any period of intermitting fevers, providing that at the same time there be neither a phlogistic diathesis prevailing in the system, nor any considerable or fixed congestion present in the abdominal viscera.

2. The proper time for exhibiting the bark in intermitting fevers is during the time of intermission, and it is to be obtained from in the time of paroxysms.

3. In the case of genuine intermittents, while a due quantity of bark is employed, the exhibition of it ought to be brought as near to the time of accession as the condition of the patient's stomach will allow.

5. In all cases of intermittents, it is not sufficient that the recurrence of paroxysms be stopped for once by the use of the bark; a relapse is commonly to be expected, and should be prevented by the exhibition of the bark repeated at proper intervals.

Our second indication for conducting the paroxysms of intermitting fevers, so as to obtain a final solution of the disease, may be answered, 1. By exhibiting emetics during the time of the cold stage, or at the beginning of the hot. 2. By opiates given during the hot stage.

The circumstances which may especially prevent the fulfilling of these two indications, and therefore give occasion to the third, are, a phlogistic diathesis prevailing in the system, and congestions fixed in the abdominal viscera. The first must be removed by blood-letting and the antiphlogistic regimen; the second, by vomiting and purging.

It is not, however, very common for intermittents to be cured by medicines given during the time of the paroxysm. The bark is the medicine to which we are chiefly to trust. Our physicians are now generally agreed, that very little preparation of the body is requisite previous to the administration of the bark, in intermitting fevers. It is sufficient to cleanse the stomach and alimentary canal by an emetic or cathartic. Where the disease is attended with sickness or nausea, six or eight grains of ipecacuanha may be given: but where there are no symptoms of this kind, it is better to give a stomachic purge, as an ounce or two of tinctura sacra, or a few grains of pil. Ruffi. These are to be administered in the intermission, immediately after the paroxysm hath ceased, so that their operation may be over before its return; and after their operation is completed, the bark may be given with perfect safety. If the paroxysm be moderate, we need not have recourse to the bark till another fit hath manifested the true nature of the disease: but if it proves severe, there is often an absolute necessity for administering the bark on the first intermission of the fever, and even with hardly any preparation of the patient.

The advantage of administering the bark as early as possible, was fully ascertained by Dr Lind in the years 1765, 66, and 67, during an uncommon prevalence of intermittents. When the disease was stopped by the bark immediately after the first or second fit, which was the case with 200 of the Doctor's patients as well as himself, neither a jaundice nor dropsy ensued; whereas, when the bark could not be administered, on account of the imperfect remission of the fever, or when the patient had neglected to take it, either a dropsy, jaundice, or constant headache, were the certain consequences; and the violence of the disease was in proportion to the number of the preceding fits, or to the continuance of the fever. By every paroxysm the dropical swellings were visibly increased, and the colour of the skin rendered of a deeper yellow. When the fever continued a few days without remission, the belly and legs generally swelled; a violent head-ach, likewise, and vertigo, for the most part distressed the patient; so that some, even after the fever had left them, were not able to walk across their chamber for a fortnight or three weeks. When the return of the fever were regular and even, but slight, four or five fits of a simple tertian were sometimes followed by the most dangerous symptoms; especially in the year 1765, when these fevers raged with the greatest violence. If, as frequently happened, a dropical patient relapsed into the ague, there was an absolute necessity for putting an immediate stop to it by the bark; and in upwards of 70 such patients, Dr Lind observed the most beneficial effects to accrue from this practice. He never prescribed the bark until the patient was free from all symptoms of the fever; but in that case, without regard to a cough, or any other chronic indispotion, he ordered it to be given in large doses, but never prescribed it during the continuance of the paroxysm.

The bark hath been often offered to fail in removing intermittents, from not continuing the use of it for a sufficient length of time, from administering it in too small a dose, or from giving it in an improper form. It was a prevailing opinion, that an ounce, or an ounce and an half, of the bark, taken during one intermission, is sufficient to prevent the return of another paroxysm. But this is not always the case; for a severe fit will often attack a patient who hath taken such a quantity. When this happens, the patient ought to persevere during the following intermissions, with an increase of the dose, till five or six ounces at least have been taken. The medicine also ought not to be omitted as soon as one fit is stopped, but should be continued in a smaller dose for at least ten days or a fortnight. Even for several months after the disease is entirely removed, it would be advisable to take a little bark occasionally in damp weather, or during an easterly wind, to prevent a relapse. Where the intervals between the fits are short, as in quotidians and double tertians, from one to two drachms of it ought to be taken every two or three hours.

The form in which this medicine is administered is of some consequence. Mucilages and syrups have been recommended to conceal the taste of it; but, from various experiments, Dr Lind found nothing more effectual for this purpose than small-beer or milk, especially the latter. A drachm of bark mixed with two ounces of milk, and quickly drank, may easily

easily be taken by a person of the most delicate taste, and by washing the mouth afterwards with milk there will not remain the least flavour of the bark; but if the mixture is not drank immediately, the bark will impart a bitter taste to the milk. This medicine is commonly given in electuaries or boluses; but Dr Lind observes, that in these forms it proves much less efficacious than when administered in juleps or draughts, with the plentiful addition of wine or spirits. He has remarked, that six drachms of powdered bark, given in a julep, consisting of one fourth or one third of brandy, is as effectual as an ounce of the powder in the form of an electuary, and proves less disagreeable to the stomach. For patients unaccustomed to wine or spirits, each draught should be warmed with spiritus falis ammoniaci, or tinct. myrrh. by both of which the efficacy of the bark is increased. The Doctor is also fully convinced that wine or spirits improve the virtues of the bark much more than elixir vitrioli, tinct. rosar. or such other medicines as have been recommended by other physicians.

For those who nauseate the bark from a weakness of the stomach or other cause, he advises it to be given in clysters, in which form it is as efficacious as when taken by the mouth. For this purpose the extract is most proper with the addition of a sufficient quantity of the tinctura thebaica in order to its being longer retained. For children labouring under intermitting fevers, Dr Lind orders the spine of the back to be anointed, at the approach of the fit, with a liniment composed of equal parts of tinctura thebaica and liniment sapon. which has often prevented it. If this should not produce the desired effect, he informs us, that two or three tea-spoonfuls of syrup. e mecon. given in the hot fit, will generally mitigate the symptoms. But for the entire removal of the disease, after purging with magnesia alba, he prescribes a drachm of the extract. cort. Peruvian. with a few drops of tinct. thebaic. in a clyster, to be repeated every three hours for a child of about a year old. When the stomach is oppressed with phlegm, the magnesia frequently occasions vomiting, which should be promoted with warm water. The constant heaviness of the head occasioned by those fevers in such tender constitutions is best relieved by the application of a blister to the back.

The bark hath also proved effectual for the cure of intermittents in children, even when externally applied, by putting the powder of it into a quilted waistcoat. Of its efficacy in this way several instances are related by Dr Samuel Pyc in the second volume of Medical Observations and Inquiries. In short, so effectual was the bark found in removing these fevers when properly applied, that of between four and five hundred afflicted with them in the year 1765, Dr Lind lost only two, neither of whom had taken this medicine.

In all these fevers, a vomit was administered whenever the patient complained of a sickness and reaching to vomit, or was seized with a spontaneous vomiting; and the bark was never given till this sickness was removed, or a purgative taken to clear more perfectly the whole alimentary canal. In those patients who were troubled with a cough, attended with a pain

in the side affecting the breathing, when the pain was not relieved by warm fomentations, the balsamum anodynum Batzi, or by a blister, the Doctor generally ordered a few ounces of blood to be taken away, and endeavoured to stop the fever as soon as possible by the administration of the bark; having found that every return of the fever increased all such pains.—When the headach was very violent, and harassed the patient during the intermissions, the success of the bark was rendered more complete by the application of a blister to the back.—A giddiness of the head, which is the symptom most commonly remaining after even a slight intermitting fever, was generally relieved by the sal. C. C. and the bark in wine. The former of these was administered in the following manner.

℞ Aq. Alex. Simp. ʒvi.

Sal. C. C. ʒfs.

Syr. e Cort. Aurant. ʒi. M. f. julep. Cap. cochlear. ij. subinde.

If from the continuance of the fever the patient was distressed with flatulence, a distention of the abdomen, and a swelling of the legs, a spoonful of tinctura sacra, with the addition of 30 drops of the spirit lavender. compos. was ordered to be taken every night.—A continuance of the bark, a change of air, and the cold bath, were often found requisite to prevent a relapse.

Such is the method of cure recommended by this experienced author, who has also discovered the efficacy and success of opium in intermitting fevers. He informs us, that he hath prescribed an opiate to upwards of 300 patients labouring under this disease; and he observed, that, if taken during the intermission, it had not the least effect either in preventing or mitigating the succeeding paroxysm: when given in the cold fit, it once or twice seemed to remove it; but when given half an hour after the commencement of the hot fit, it generally gave immediate relief.—When given in the hot fit, the effects of opium are as follow. 1. It shortens and abates the fit; and this with more certainty than an ounce of the bark is found to remove the disease. It generally gives a sensible relief to the head, takes off the burning heat of the fever, and occasions a profuse sweat. This sweat is attended with an agreeable softness of the skin, instead of the burning sensation which affects patients sweating in the hot fit, and is always much more copious than in those who have not taken opium. 3. It often produces a soft and refreshing sleep to a patient tortured in the agonies of the fever, from which he awakes bathed in sweat, and in a great measure free from all complaints.

The Doctor has always observed, that the effects of opium are more uniform and constant in intermitting fevers than in any other disease, and are then more quick and sensible than those of any other medicine. An opiate thus given soon after the commencement of the hot fit, by abating the violence and lessening the duration of the fever, preserves the constitution so entirely uninjured, that, since he used opium in agues, a dropy or jaundice has seldom attacked any of his patients in those diseases. When opium did not immediately abate the symptoms of the fever, it never increased their violence. On the contrary, most patients



tients reaped some benefit from an opiate given in the hot fit, and many of them bore a larger dose at that time than they could do at any other. The Doctor assures us, that even a delirium in the hot fit is not increased by opium, though opium will not remove it. Hence he thinks it probable, that many symptoms attending these fevers are spasmodic; but more especially the head-ach. However, if the patient is delirious in the fit, the administration of the opiate ought to be delayed until he recovers his senses, when it will be found greatly to relieve the weakness and faintness which commonly succeed the delirium. Dr Lind is of opinion, that opium in this disease is the best preparative for the bark; as it not only produces a complete intermission, in which case alone that remedy can be safely administered; but occasions such a salutary and copious evacuation by sweat, as generally to render a much less quantity of bark requisite. He commonly prescribes the opiate in about two ounces of tinctura sacra, when the patient is comatose, who is to take the bark immediately after the fit. By these means the paroxysm is shortened, and the intestines are cleansed, previous to the administration of the bark; as the opiate doth not prevent, but only somewhat retard, the operation of the purgative. When a vomit is given immediately before the paroxysm, the administration of the opiate should be postponed till the hot fit is begun.

## II. The Irregular or Spurious TERTIAN.

Sp. I. var. 1. B.

*Tertiana notha five spuria, Sauv. sp. 2. Sennert. Cleghorn. Hoffman.*

The characteristic marks of this fever are, that its paroxysms last longer than 12 hours, and consequently it inclines more to the quotidian or continued fever than the former. Its paroxysms have no stated hour of attacking. The cure, however, is precisely the same with that above described, observing the proper cautions already mentioned with regard to the use of the bark.

## III. The Double TERTIAN. Sp. I. var. 2. C.

*Tertiana duplex, Sauv. sp. 13. Vog. G. 12. Sennert. Cleghorn.*

*Duplicana, Lin. 18.*

The double tertian comes on every day; but differs from the quotidian in so far, that its paroxysms do not answer to each other singly, but alternately. The first day, for instance, the fit will come on in the forenoon, the second in the afternoon, the third in the forenoon, &c.

Of these fevers we shall give the following description from Cleghorn's treatise on the diseases of Minorca: "They are called *double tertians* when there are two fits and two intervals within the time of each period. But commonly there is some difference between the two fits, either in respect of the hour they come at, the time of their duration, or the nature and violence of their concomitant symptoms. Some double tertians begin in this manner.—On the evening of Monday, for example, a slight fit comes on, and goes off early next morning; but on Tuesday, towards the middle of the day, a more severe paroxysm begins, and continues till night. Then there is an interval to Wednesday evening, when a slight fit commences a

new period of the fever, which proceeds in the same manner as the first; so that (according to the way physicians calculate the days of discharges, by beginning to reckon from the first hour of their invasion,) both paroxysms happen on the odd days, while the greatest part of the even days is calm and undisturbed. But in most double tertians the patient has a fit every day of the disease; the severe one commonly appearing at noon upon the odd days, the slight one towards evening on the even days; though sometimes the worst of the two fits happen on the even days.

"There is a tertian fever† sometimes to be met† See with, during each period of which there are three different fits, and as many intervals. For example, towards Monday noon the patient is seized with a paroxysm, which declines about five or six o'clock the same evening; a few hours after, another fit begins, and continues until morning: from which time there is an interval to Tuesday evening, when a third fit comes on, and lasts most part of the night. On Wednesday there are again two paroxysms, as on Monday and on Thursday, like that of Tuesday; and thus the fever goes on with a double fit on each of the odd days, and a single fit on the even days.

"In double tertians, that interval is the most considerable which follows the severe fit; for the slight fit oftener ends in a remission than intermission, and frequently lingers till the other approaches: Hence it is, that the night preceding the vehement fit is much more restless than that which comes after it, as has been observed by Hippocrates. In double tertians, the vehement fit often comes on a little earlier in each period, while the slight fit returns at the same hour, or perhaps later and later every other day: so that the motions of one have no influence on those of the other; from whence it appears, that each of these fits hath its own proper independent causes."

## IV. Duplicated TERTIAN. Sp. I. var. 2. D.

*Tertiana duplicata, Sauv. sp. 14. Jones, River.*

This hath two fits on the same day, with an intermediate day on which there are none. This also doth not differ in any remarkable particular from those already described.

## V. The Triple TERTIAN. Sp. I. var. 2. E.

*Tertiana triplex, Sauv. sp. 15. Cleghorn.*

*Semitertiana, Hoffman.*

*Semitertiana primi ordinis, Galen. Spig.*

This differs from the former in having a single and double fit alternately: thus, for instance, if there are two fits the first day, there is only one the second, two the third, one the fourth, &c. Its cure the same as before.

## VI. The Semi-TERTIAN. Sp. I. var. 2. F.

*Hemitritæus, Cels.*

*Semitertiana, Cleghorn.*

*Semitertiana secundi ordinis, Galen. Spig.*

*Amphimerina hemitritæus, Sauv. sp. 8.*

*Amphimerina pseudo hemitritæus, Sauv. sp. 9.*

The semitertian is described by Dr Cullen as having only an evident remission between its paroxysms; more remarkable between the odd and even day, but less so between the even and odd one. For this reason, he adds, that possibly some semitertians ought rather to be classed among the remittents; and owns that it is

difficult to settle the boundaries between them. But Cleghorn, whom he quotes, describes it in the following manner. "A fit begins on Monday noon, for example, and goes off the same night. On Tuesday afternoon a second fit comes on, and gradually increases till Wednesday night, when it terminates. On Thursday morning there is such another interval as happened on Tuesday morning: But on Thursday afternoon another long fit like the preceding commences; and returning regularly every other day, leaves only a short interval of ten or twelve hours during the eight-and-forty."

Concerning the cure of these fevers Dr Cullen observes, that though no entire apyrexia occurs, the bark may be given during the remissions; and it should be given even though the remissions be inconsiderable; if, from the known nature of the epidemic, intermissions or considerable remissions are not to be expected, and that great danger is apprehended from repeated exacerbations.

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# VII. The Sleepy TERTIAN. Sp. I. var. 3. G.

Tertiana carotica, *Sauv.* sp. 10. *Werthol.*

Tertiana hemiplegica, *Sauv.* sp. 20. *Werthol.*

Quotidiana soporosa, *Sauv.* sp. 8. *Car. Pif.*

Febris caput impetens, *Sydenham*, ep. ad R. Brady.

This, according to Vogel, is a most dangerous species, and very commonly fatal; for which reason he ranks it among those intermittents which he calls *malignant*. Sometimes he tells us the alarming symptom of a sleepiness comes on, not at the beginning of the disease, but will unexpectedly occur during the third, fourth, fifth, or sixth paroxysm. It commonly begins with the cold fit, and continues during the whole time of the paroxysm, and, becoming stronger at every succeeding one, at last terminates in a mortal apoplexy. Sometimes fevers of this kind rage epidemically. Vogel relates, that he saw a simple tertian changed into one of these dangerous fevers. The patient was a woman of a delicate constitution, and the symptom appeared in consequence of her being put in a violent passion; however, it occurred but once, and she recovered. Hoffman \* mentions a carus in a double tertian occurring seven times without proving mortal; tho' Vogel says, that the powers of nature are very seldom sufficient to conquer the disease.

In 1678, Dr Sydenham tells us that intermittents raged epidemically at London, where none had appeared before 1664. Of them "it is to be noted (says he), that though quartans were most frequent formerly, yet now tertians or quotidianas were most common, unless the latter be entitled double tertians; and likewise, that though these tertians sometimes began with chilliness and shivering, which were succeeded first by heat, and soon after by sweat, and ended at length in a perfect intermission, returning again after a fixed time, yet they did not keep this order after the third or fourth fit, especially if the patient was confined to his bed and used hot cardiaca, which increase the disease. But afterwards this fever became so unusually violent, that only a remission happened in the place of an intermission; and approaching every day nearer the species of continued fevers, it seized the head, and proved fatal to abundance of persons."

From this description of Sydenham's we may have an idea of the nature of the disease. As to its cure, our author strongly recommends the bark; telling us, that, even in the *most continued* kind of intermittents, "the nearer the intermittent approaches to a continued fever, either spontaneously, or from using too hot a regimen, so much the more necessary is it to exhibit a larger quantity of the bark; and that he took advantage of a remission, though ever so small.

# VIII. The Spasmodic or Convulsive TERTIAN. 243

Sp. I. var. 3. H.

Tertiana athmatica, *Sauv.* sp. 6. *Bonet.*

Tertiana hysterica, *Sauv.* sp. 8. *Wedel. A. N. C.*

Dec. I. A. II. obs. 193.

Hysteria febricosa, *Sauv.* G. 135. sp. 8. A. N. C.

Dec. I. Ann. II.

Tertiana epileptica, *Sauv.* sp. 16. *Calder. Lautter.*

Quotidiana epileptica, *Sauv.* sp. 3. *Edinb. Essays*,

vol. 5. art. 49.

Eclampsia febricosa, *Sauv.* G. 133. sp. 17.

Epilepsia febricosa, *Sauv.* G. 134. sp. 9.

Tertiana tetanodes *Medici Beobacht. I. Band.*

Tetanus febriculosus, *Sauv.* G. 122. sp. 10. *Stork,*

Ann. Med. II.

Tertians of this kind occur with very different symptoms from those of the true ones, and sometimes even with those which are very extraordinary. In some they are attended with symptoms of asthma, in others with those of hysterics, in others with convulsions.—Where the symptoms of asthma occur, the disease must be treated with diuretics and antispasmodics joined with the bark.—In the hysterical asthma the fit comes on with cold, yawning, cardialgia, terror and dejection of mind. The disease is to be removed by mild aperients and antihysterics joined with the bark.

Of the convulsive tertian we have a most remarkable instance in the Edinburgh Medical Essays, Vol. V. The patient was a farmer's son about 26 years of age, of a strong plethoric habit of body. He had laboured under an ague half-a-year, and had taken a great deal of bark. While he was telling his case to the surgeon (Mr Baile of Pembroke) he was suddenly taken with a violent stamping of his feet; and the convulsions gradually ascended from the soles of the feet, to his legs, thighs, belly, back, and shoulders. His head was then most violently convulsed, with a total deprivation of speech; but he had a most dismal vociferation, that might have been heard at a considerable distance, his abdomen and thorax working and heaving violently and unusually in the mean time. This fit having lasted half an hour, a profuse sweat broke out over all his body, which relieved him; and he then became capable of answering such questions as were put. These extraordinary fits, he said, had been occasioned by a fright, and his neighbours had concluded that he was bewitched. They returned sometimes twice a-day, and always at the times the ague used to return. During the paroxysm his pulse was very high and quick, his face much inflamed, and his eyes ready to start out of his head. After the fit was over, he complained of a most torturing pain of the bowels. His tongue was generally moist, and he had a suppression of urine.—This formidable disease, however, was totally subdued by the use

\* *Med. Ration. System.*  
T. I.  
P. IV.

PRACTICE of the bark, mercurials, antispasmodics, opiates, and saline draughts.

- 244 IX. *The Eruptive TERTIAN.* Sp. I. var. 3. I.  
Tertiana pecthialis, *Sauv.* sp. 3. *Donat. Lautt.*  
Tertiana scorbutica, *Wedel. A. N. C. Dec. I.*  
A. II. obs. 193.

*Tertiana urticata, Sauv.* sp. 22. *Planchon. Journ. de Med.* 1765. *Cleghorn.*

*Tertiana miliaris, Sauv.* sp. 21. *Walthier.*

This species of tertian is accompanied with red or livid blotches on the skin, or an eruption like that occasioned by the stinging of nettles. In the latter case Dr Cleghorn says the disease is very dangerous; and as the former indicates an incipient dissolution and putrefaction of the blood, it must also be reckoned of very dangerous tendency.

- 245 X. *The Inflammatory TERTIAN.* Sp. I. var. 3. K.  
Tertiana pleuritica, *Sauv.* sp. 4. *Valef. Lautt.*  
Pleuritis periodica, *Sauv. G.* 103. sp. 14.  
Tertiana arthritica, *Sauv.* sp. 5. *Morton, Lautt.*

Sauvages informs us, that he hath seen a true and genuine pleurisy having all the pathognomic signs of the disease, but assuming the form of an intermittent; that is, the patient is one day affected with the pleurisy, and the next seemingly in perfect health. He also tells us, that in the month of May 1760 a tertian raged epidemically, which after the third fit imitated a pleurisy, the pain of the side and difficulty of breathing coming regularly on, and the fever from an intermittent becoming remittent; the blood had also the same appearance with that of pleuritic persons, and the distemper yielded to bleeding and gentle cathartics.—Morton also informs us, that he has observed similar disorders an hundred times over, which were always certainly and safely cured by the Peruvian bark.

- 246 XI. *The TERTIAN complicated with other Disorders.*  
Sp. I. var. 4.

*Tertiana scorbutica, Sauv.* sp. 9. *Etmuller. Timentius.*

*Tertiana syphilitica, Sauv.* sp. 17. *Deidier.*

*Tertiana verminosa, Sauv.* sp. 18. *Stiffer.* in act.  
*Helmstad. Lancet. de noxis palud. Pringle.*  
*Ramazzini. Van den Bosh.*

The scorbutic tertian, according to Sauvages, is exceedingly anomalous, its periods being sometimes much anticipated, and sometimes much postponed. It is exceedingly obstinate, and will return even seven times, if the body is not cleared of its scorbutic taint. The patient is affected with lancing pains of a wandering nature. The urine lets fall a dusky red sediment, or a thick branny matter is copiously scattered up and down in it, seemingly tinged with blood. The usual symptoms of scurvy, viz. livid spots, and rotten fetid gums, also frequently occur. For this the Peruvian bark is very useful, both as a febrifuge and antiscorbutic.

The tertian accompanied with worms is taken notice of by Sir John Pringle in his treatise on the diseases of the army. The worms, he tells us, were of the round kind; and though we are by no means to reckon them the cause of the fever, they never failed to make it worse, occasioning obstinate gripings or sickness at stomach. In these cases flitches were fre-

quent; but, being flatulent, were not often relieved by bleeding. The worms were discharged by vomiting as well as by stool. For discharging these worms, he commonly gave half a drachm of rhubarb with twelve grains of calomel; without observing any inconvenience from such a large dose of mercury. Anthelmintics, which act slowly, had little chance of doing good; for, though worms will sometimes lie long in the bowels, without giving much uneasiness to a person otherwise well, yet in a fever, especially one of a putrid kind, (to which his intermittents always seemed to incline), the worms being annoyed by the increase of heat, and the corruption of the humours in the *primæ viæ*, begin to move about, and struggle to get out. Lanciscus, who makes this remark, adds, that upon opening the bodies of some who had died at Rome of fevers of this kind, wounds were found in the intestines, made by the biting of the worms; nay, that some of them had even pierced through the coats of the guts, and lay in the cavity of the abdomen. Pringle never had any instance of this; but knew many cases in which the worms escaped by the patient's mouth, though there had been no previous retching to bring them up. One soldier was thrown into violent convulsions, but was cured by the above-mentioned powder.

- XII. *The TERTIAN arising from various Causes.* 247  
Sp. I. var. 5.

*Tertiana accidentalis, Sauv.* sp. 12. *Sydenham.*

*Tertiana a scabie, Sauv.* sp. 12. *Juncker, tab. 80.*  
*Hoffman, II. p. 12.*

The existence of fevers of this kind, as we have already observed, is denied by Dr Cullen; the accidental fever of Sauvages was said to arise from any slight error in the non-naturals, and consequently was very easily cured. That which arose from the repulsion of the itch, was cured as soon as the eruption returned.

- XIII. *The TERTIAN with only an intermission between the fits.* Sp. II. 248

*Tritæphya, Sauv. Gen. 85. Sag. p. 695.*

*Tritæus, Lin. 21.*

*Hemitritæa, Lin. 23.*

*Tertianæ remittentes et continuæ Auctorum.*

*Tertianæ subintrantes, proportionatæ, subcontinæ, Torti.*

*Tertiana subcontinua, Sauv.* sp. 19.

*Quotidiana deceptiva, Sauv.* sp. 2.

*Amphimerina semiquintana, Sauv.* sp. 24.

*Tritæphya deceptiva, Sauv.* sp. 10.

*Causos Hippocrati.*

*Tritæphya caufus, Sauv.* sp. 2.

*Febris ardens Boerhaavii, aph. 738?*

*Tertiana perniciofa, quæ simulata tertiani circuitus effigie lethalis, et mille accidentibus periculossimis implicata, existit. Lud. Mercatus.*

*Tertiana pestilens, P. Sal. Diversus.*

*Tertiana maligna pestilens, Riverii.*

*Morbis Hungaricus, Lang. Lemb. Sennert.*

*Jordan.*

*Langor Pannonicus, Cöber.*

*Amphimerina Hungarica, Sauv.* sp. 10.

*Hemitritæus pestilens, Schenck. ex Corn. Gamma.*

*Febris pestilens Egyptiorum, Alpin.*

*Febris tertiana epidemia, Bartholin.*



Febres epidemicæ, autumnii 1657 et 1658, *Willis*.  
 Febris fynches epidemica, ab anno 1658 ad 1664,  
 et postea ab anno 1673 ad 1691, *Morton*.

Febres autumnales incipientes, *Sydenham*.

Affectus epidemius Leidensis, *Fr. Sylvii*.

Morbus epidemicus Leidensis, 1669, *Fanois*.

Tertianæ perniciose et pestilentes, et febres castrenses epidemicæ, *Lancisi*.

Febres intermittentes anomalæ et mali moris, *Hoffman*.

Febris cholericæ minus acuta, *Hoffman*.

Febris epidemica Leidensis, ab anno 1719, *Koker* apud *Haller*, *Disp.* tom. V.

Amphimerina paludosa, *Sauv.* sp. 19.

Febris paludum illust. *Pringle*.

Bononiensis constitutio hiemalis 1729 *Beccari* in *A. N. C.* Vol. III.

Aphimerina biliosa, *Sauv.* sp. 22.

Febris castrensis, *Pringle*.

Febris putrida epidemica, *Huxham* de *airè* ad ann. 1729.

Febris biliosa Lausannensis, *Tissot*.

Tritætophya Wratislaviensis, *Sauv.* sp. 3. *Hahn*.

Epidemia verna Wratislav. in *App.* ad *A. N. C.* Vol. X.

Tritætophya Americana, *Sauv.* sp. 12.?

Febris anomala Batava, *Grainger*.

Morbus Naronianus, *Fujati*.

Febris continua remittens, *Hillary*'s diseases of Barbadoes.

Febris remittens Indiæ orientalis, *Lind.* *diff.* inaug. 1768.

Febris critica et febr. biliosa æstatis, *Rouppé*.

Febris remittens regionum calidarum, *Lind* on the diseases of hot climates,

TORTI'S  
Tertianæ  
Comitate.

A. Tertianæ cholericæ five dysentericæ, *Tort.* *Therap. Special.* lib. iii. cap. 1. *Lautter*, *Hist. Med.* cas. 6. 16. 17. 20. *Morton*, *App.* ad *Exerc.* II.

B. Tertianæ subcruenta five atrabilaris, *Tort.* *ibid.* Never seen by *Cleghorn*.

C. Tertianæ cardiaca, *Tort.* *ibid.* *Lautter*, *Hist. Med.* cas. 15. 15. 23.

Amphimerina cardiaca, *Sauv.* sp. 5.

Tritætophya affodes, *Sauv.* sp. 6.

Febris continua affodes, *Veg.* 27.

D. Tertianæ diaphoretica, *Tort.* *ibid.*

Tritætophya typhodes, *Sauv.* sp. 4.

Tritætophya elodes, *Sauv.* sp. 5.

Febris continua elodes, *Veg.* 21.

E. Tertianæ fyncopalis, *Tort.* *ibid.* *Lautter*, cas. 11. 12. 13. 15. 16.

Tritætophya fyncopalis, *Sauv.* sp. 1.

Amphimerina fyncopalis, *Sauv.* sp. 4.

Amphimerina humorosa, *Sauv.* sp. 6.

Febris continua fyncopalis, *Veg.* 29.

F. Tertianæ algida, *Tort.* *ibid.* *Lautter*, cas. 13.

Amphimerina epiala, *Sauv.* sp. 3.

Amphimerina phricodes, *Sauv.* sp. 7.

Tritætophya leipyria, *Sauv.* sp. 9.

Tertianæ leipyria, *Saug.* sp. 23. *Valcarengi* *Med. Ration.* p. 18.

Febris continua epiala et leipyria, *Veg.* 19. et 24.

G. Tertianæ lethargica, *Tort.* *ibid.*

Tritætophya carotica, *Sauv.* sp. 7. *Lautter.* 1. 7. 14.

Tertianæ apoplectica, *Morton.* *Exerc.* I. cap. ix. *PRACTICE* *hist.* 25.

Tertianæ soporosa, *Werthof.* de febr. p. 6.

Febris epidemica Urbevetana, *Lancisi.* de noxis pal. *effluv.* I. II. c. 3.

The remittent fevers are much more dangerous than the true intermittents, as being generally attended with much greater debility of the nervous system and tendency to putrefaction in the fluids than the latter. *Sanvages* divides his tritætophya, a remittent tertian, into the following species.

1. *Tritætophya fyncopalis*, or that attended with fainting. It begins like a tertian, with cold succeeded by heat and profuse sweating; but attended with much more dangerous symptoms, such as cardialgia, enormous vomiting, great weakness, small contracted pulse, coldness of the extremities, and, unless timely assistance be given, kills during the second or third paroxysm.

2. *The causus*, or burning fever of *Hippocrates*, returns every third day without any new sensation of cold; and is attended with great thirst, heat, but without diarrhœa or sweat, and continues only for one week or two at the utmost. It attacks chiefly young people of a robust and bilious habit of body, who have been accustomed to much exercise, and exposed to the sun during the heats of summer, and have also used a phlogistic regimen. The tongue is dry, sometimes black; the urine of a red or flame colour; together with pain of the head, anxiety, and sometimes other symptoms still more dangerous.

3. *Tritætophya Wratislaviensis*, was a pestilential disease occasioned by famine, during which the people fed on putrid aliments: the air was infected by the vast numbers of bodies slain in battle, and the inhabitants were also dejected by reason of being deprived of their harvest, and other calamities; to all which was added the continuance of a calm in the atmosphere for a long time. It began with an acute fever, leipyria or coldness of the external parts and sensation of burning heat inwardly; general weakness; pain of the head and præcordia; serous or bilious diarrhœa; a delirium, in some furious, and accompanied with a dread of being exposed to the air; on the second day the thirst was violent, attended with a bilious vomiting as well as diarrhœa, tough viscid spitting, fainting, burning heat in the bowels, the tongue dry and seeming as if burnt with a hot iron, a suppression of the voice, anxiety, stupor, after which quickly followed convulsions and death. In some fevers a leipyria came on with an exceeding great cold of the extremities, presently followed by an intolerable heat of the viscera, with symptomatic sweats, violent diarrhœa, followed by a very itchy military eruption. On the fourth day came on copious sweats, spasms of the lower jaw, nausea, involuntary passing of urine, slight delirium, a flux of ichorous matter from the nostrils, an exceeding tough spitting, an epilepsy, and death. Professor *Hahn* himself, who gives the history of this disease, was attacked by it, and suffered in the following manner. On the first day was a violent feverish paroxysm without rigor, a sharp pain in the occiput, and immediately an inflammatory pain over the whole head; the feet were extremely cold, and the extremities rigid with spasms. The pain continued to increase daily to such a degree, that the contact of the air itself became at last intolerable; a

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dejection of mind and incredible weakness followed; he passed restless nights with continual sweating, heavy and pained eyes, and an universal sensation of rheumatism over the whole body. On the third day the pains were assuaged, but he had a very bad night. On the fourth day all the symptoms were worse, the feet quite chilled, the hands very red and agitated with convulsive motions; he was terrified with apprehensions of death, and had a vomiting every now and then: this day sponges dipped in cold water were applied over the whole body, and he used cold water for his drink. On the eighth day the pulse was convulsive; and the pains were so violent, that they made him cry out almost continually. On the ninth day he was delirious, and threw up some grumous blood. On the 11th his pulse was more quiet, and he had a sweat; a decoction of the bark was given: his voice was broken, his speech interrupted, and his teeth chattered upon one another. On the 12th his jaw was convulsed, he had a risus sardonius, and deafness; after which, the paroxysms returned less frequently, and only towards night. On the 14th he had a chilling cold over the whole body, a cold sweat; frequent lotions were applied, and all the symptoms became milder. On the 18th he had a quick delirium, but fainted as soon as taken out of bed; a sensation of hunger, followed by copious sweats; profound sleep; an aversion from noise; every thing appeared new and extraordinary. On the 36th a cholera, on the 48th a scaling off of the skin, and falling off of the nails.

252 4. *Tritaphya typhodes*. The principal symptom of this fever was a continual sweat with which the patients were almost always wet; with paroxysms returning every third day. Sauvages tells us, that he had twice an opportunity of observing this fever; one was in the teacher of an academy, about 40 years of age, and of a melancholic temperament. He sweated every other night so plentifully, that he was obliged to change his linen nine times; and even on the intermediate days was never perfectly free of fever, and had his skin moistened with sweat. The other was of a woman who went about in man's clothes, and was discovered only after her death. The disease began with a slight sensation of cold, after which she sweated for eight hours. It was attended with the highest debility, anxiety, and at the same time an insatiable hunger.

253 5. *Tritaphya elodes*, was an inflammatory epidemic, but not contagious, terminating about the 14th or 21st day. The disease came on in the night-time, with disturbed rest, universal weakness, watchings, great heat and sweat, redness of the face and almost of the whole body, sparkling eyes, the tongue dry and white; a hard, tense, and turgid pulse: about the third day a kind of frenzy frequently came on with the severest paroxysm, the forerunner of an universal miliar eruption; or, what was worse, with purple spots so close together, that they looked like an erysipelas of the whole body. Sometimes blisters of the size of small pearls, filled with acrid serum, appeared on the neck, armpits, and trunk of the body, which were of all others the most dangerous. There was a variety of the disease, which our author calls the *humoralis*, and in which the pulse was soft and feeble, with greater weakness over the whole body, and the disposition to sleep more frequent than in the other; the eyes languid; the tongue very white, but not dry; and

worms were discharged.

6. *Tritaphya afides*. This species, our author informs us, arose from a foulness of the *primæ viæ*, and the effluvia of waters in which hemp had been steeped. It began with rigor, followed by great heats, restlessness, tossing of the limbs, terrible faintings, immoderate thirst, dryness of tongue, delirium, and at length excessive watchings; these last, however, were less dangerous than vertiges or comatose dispositions, which brought on convulsions or apoplexies.

255 7. *Tritaphya carotica*. This had exacerbations every other evening; and its distinguishing symptom was an excessive inclination to sleep, preceded by a severe headach, and followed by delirium, and sometimes convulsions; the tongue was black, and the patient insensible of thirst after the delirium came on. In those cases where the disease proved fatal, a subulcus tendinum and other grievous symptoms came on.

256 9. *Tritaphya leiphyia* is only a variety of the *tritaphya caulis*, already described.

257 10. *Tritaphya deceptiva*. This species at first assumes the appearance of a continued fever; but afterwards degenerates into a remittent, or even an intermittent. It is described by Sydenham, but attended with no remarkable symptoms.

258 11. The last of Sauvages's species of *Tritaphya* belonging to the remitting tertian is the *Americana*; and even this seems doubtful to Dr Cullen. This, according to Sauvages, is the ardent fever with which the Europeans are usually seized on their first coming to America, and generally carries off one half of them. Of this there are two varieties, the *very acute* and the *acute*. The *very acute* ends before the seventh day. It comes on a few days after the person's arrival, with loss of appetite, with dyspnoea and sighing from weakness, head-ach, lassitude, pain of the loins: a pyrexia succeeds, with great thirst, sweat, and heat; the sickness increases, nausea comes on, with vomiting of porraceous bile; the tongue rough, the extremities often cold; watching, furious delirium; and the patient frequently dies on the third day. Copious sweats, and a plentiful hæmorrhage from the nose on the fifth day, but not sooner, are serviceable; but a bilious diarrhoea is the best crisis of all.

The *acute* kind terminates most frequently on the ninth, but very rarely goes beyond the fifteenth. Death frequently comes on between the fourth and seventh days. It begins with head-ach, pain in the loins, and sometimes shivering; great lassitude, dyspnoea, thirst; burning fever, increasing every third day; inflation of the abdomen, pain at the pit of the stomach, nausea, and bilious vomiting. Such is the state of the disease within twenty-four hours. The eyes are red, and full of tears; the urine pellicud; there is a low delirium, and continual anxiety; the tongue is dry and red, and sometimes, though rarely, black, which is a still worse sign; the pulse, formerly strong and full, sinks about the fourth day, and becomes tense and spasmodic: if a crisis then comes on, the patient dies the fifth or sixth day; but if the pulse keeps up, and no crisis comes on, a crisis is to be expected by sweat, a copious hæmorrhage from the nose, or, which is still more rare, by a bilious diarrhoea, which is never salutary if it comes on before the fifth day.

To the remitting tertian also belong the following species

PRACTICE species mentioned by Sauvages, viz.

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1. *Tertiania subcontinua*. This begins like a genuine tertian, and at first hath distinct paroxysms; but these grow gradually more and more obscure, the disease acquiring daily more of the appearance of continued fever, by which it is to be distinguished from the other varieties of this species. It is not unfrequently joined with those symptoms which attend the pernicious fever already mentioned; as cardialgia, cholera, syncope, &c. but in a much less degree. The disease commonly begins with little or no sense of cold, but rather a sensation of heat: when the tertian is doubled, it has first a slighter and then a more severe fit; and thus goes on with an exacerbation on the even days: and though it should change from a double into a single tertian, we are still to suspect it, if a weak fit is the forerunner of a very strong one. This change of the tertian into a continued fever is also to be prognosticated if a heat remarkable to the touch is perceived on the day of intermission, together with some disturbance of the pulse, thirst, and dryness of the tongue; all of which shew an universal tendency to inflammation: the same is foretold by the urine being in small quantity, and very red, or of a saffron colour; also an ulcerous or aphthous inflammation of the throat, with difficulty of swallowing, or any very severe symptom coming on in the beginning of the disease, excepting only a delirium, which is easily removed.

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2. *Quotidiana deceptiva*. This is a disorder of an inflammatory kind, with a strong tendency to putrescency, and sometimes assumes the form of a quotidian. In it the patient frequently complains of cold when he really is hot and the remission is very indistinct, and the disease is known by the great languor of the patient and the foulness of his tongue.

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3. *Amphimerina cardiaca* is an acute malignant fever, with daily exacerbations, attended with fainting and vomiting of green bile. Afterwards, the weakness increasing, the patient's extremities grow cold, and a profuse cold sweat comes on, which is frequently succeeded by death on the fourth day. Another species resembling this he calls the *syncopealis*; but the cardiaca differs from it in being attended with cardialgia.

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4. *Amphimerina paludosa*. This is the fever described by the British physicians under many different names, and appearing under various forms, according to the different constitutions of the patients. Its appearance in the East Indies, according to Dr Lind of Edinburgh, generally comes on suddenly, and begins with a sense of debility and a very great lowness of spirits. These symptoms are attended with a greater or less degree of chilliness, a dizziness, a nausea, very acute pains in the head and loins, and a trembling of the hands; the countenance is pale, the skin commonly very dry and corrugated, the eyes dull and heavy, the pulse quick and small, the breath generally difficult, and interrupted with hiccups.

As the paroxysm increases the chilliness now and then gives way to irregular heats, which soon become violent and permanent; the nausea likewise increases; and in some there comes on a vomiting, in which they throw up a great deal of bile. Sometimes bile is likewise voided by stool. The skin grows red; the eyes small, and sometimes not a little inflamed. The

pulse becomes fuller and the breath more difficult, attended with great restlessness and a troublesome thirst; notwithstanding which (so great is the nausea) the patient cannot endure any kind of liquids. The tongue becomes foul, and the pain of the head and loins more violent; a delirium then follows; a slight moisture appears on the face, and from thence spreads to the other parts; whilst the violence of the other symptoms abates, and shews the beginning of a remission, which is completed by plentiful sweats.

On the fever's remitting, the pulse returns almost to its natural state; the pains of the head and loins still continue, though somewhat less violent, as likewise the nausea and want of appetite. When the disease gains strength, the remission is scarcely obvious, and is immediately followed by another paroxysm; which begins, not indeed with so great a shivering, but is attended with a greater pain of the head, the greatest anxiety, a heartburn, nausea, vomiting, and bilious stools. The matter most commonly evacuated by vomit and stool was whitish like chalk and water, or curdled milk which is vomited by sucking children, when the curd is much broken down. A heat, immoderate thirst, and delirium, now come on. The tongue becomes more foul; the teeth and inside of the lips are covered with a black crust; the breath grows hot and fetid: another remission ensues, attended with a sweat; but this remission is both shorter and less obvious than the first.

This second remission is succeeded by a paroxysm, in which the symptoms are far more violent than in the former; that which the patient discharges by vomiting and purging is more fetid; the mouth, teeth, and inside of the lips, are not only covered with a black crust, but the tongue becomes so dry and stiff, that the patient's voice can scarce be heard. Violent delirium, with restlessness and anxiety, come on chiefly during the paroxysm; nor do these symptoms abate till the fever remits, and the patient sweats.

When the fever becomes so violent, during the third fit, as to end in death, which is generally the case, some of the sick have a coma; in others the delirium becomes more violent. The discharges now become more fetid, and have a cadaverous smell; the stools are involuntary; the pulse is so quick, small, and irregular, that it is scarce to be counted, or even felt; a cold sweat is diffused over the whole body, especially the head and neck; the face becomes Hippocratic and convulsed; the patient picks the bed-clothes; a subultus tendinum comes on; the sick lie constantly on their backs, and insensibly slide down to the foot of the bed; their extremities grow cold; they are then seized with convulsions, with which the scene closes.

In this fever, the urine, which at the beginning is pale, becomes of a deeper colour by degrees, but without depositing any sediment. There seldom or never appear any petechia, and the prickly heat which was before on the skin vanishes on the first appearance of the fever. But though these were the general symptoms of this disorder, they varied in different subjects, and at different seasons of the same year. The pulse, for example, in some, was quick in the beginning of the disorder; in others, it varied with,



practise with the other symptoms. The skin was generally dry in the beginning of the fit; but in some it was moist, and covered with sweat from the very first beginning of the disease. In the month of September; when the disorder raged most, the remissions were very imperfect and obscure; but, on the return of winter and the healthy season, they became more regular, and the disease assumed the appearance of an intermitting fever, to such a degree as at length not to be distinguished from it. In some the remissions could scarce be perceived, and the fever continued for two weeks without any material change for the better or the worse. At this time numbers were seized with it. When the disorder continued for any time without a change, it generally ended in death: while the weather grew better, it sometimes, in the space of a few days, from a common fever became an intermitting one, and the patient recovered, unless his liver, which was sometimes the case, happened to be affected. The cure of an inflammation of the liver proved uncertain, and tedious; as it was generally followed by a colliquative diarrhoea, which greatly endangered the patient's life.—Every succeeding paroxysm was observed to be more dangerous than the preceding; the third generally proved fatal; some died during the first. When this happened, the fever, in the language of the country, was called a *pucca*, that is, a strong fever.

This disease, according to Dr Lind of Hasser hospital, is the autumnal fever of all hot countries, the epidemic disease between the tropics, and the disease most fatal to Europeans in all hot and unhealthy climates. All authors agree that intermittents in general, but particularly this dangerous kind of them, are produced by heat and moisture. Dr Cullen, however, is of opinion, that in Scotland the heat is never sufficiently powerful for this purpose, but that intermittents are first imported from some other country, after which they spread. Dr Lind of Edinburgh remarks that the European seamen are very subject to the fever above-mentioned when they happen to arrive at Bengal in autumn. They are predisposed to it from the nature of their food, their confinement on board, the very great heats to which they are exposed during the voyage, and their lying for hours together exposed to the night colds.

Most of the meat used by the crews of these ships is salted, and often in a putrid state, without any fresh vegetables, they having only biscuits, and some other farinaceous matters. The quantity of the vinous or spirituous liquors allowed them is by far too small to subdue the putrescent disposition of their animal-food. Their fluids consequently become, from day to day, more and more putrescent, and of course the more apt to breed and contract this disorder. This disposition is likewise induced by their being stowed very close together, and that for a considerable length of time, and in a foul air, especially when the weather happens to be too stormy to permit the hatches and port-holes to be kept open.

Though the heats they endure in the voyage to India are less considerable than those of the country itself, yet they are too much for an European constitution to bear. The general heat at sea within the tropics is about 84° of Fahrenheit's thermometer, which is suf-

ficient to relax them, and promote a corruption of their humours, especially when it coincides with the above causes. It likewise creates a languor and indolence, which alone are sufficient to increase that putrefaction. These causes are apt to be considerably aggravated by the mens being often exposed, when on duty, for hours together, to rain, damp, and cold air; a circumstance which frequently happens them when working their ships up the river Ganges in the night-time. Hence the perspiration is checked, and the excrementitious fluid which used to be discharged by the skin being retained in the body, contributes vastly towards the predisposition to this disease.

But the most powerful of all the remote causes is justly thought to be the effluvia of marshes replete with putrid animal-substances. We have not, however, been able to determine from what kind of putrid animal-substances these effluvia derive their virus. For that every kind of putrefaction has not such an effect appears from this, that neither practical anatomists, nor those who by their trades are exposed to the putrid effluvia of animals, for instance such tanners and butchers as keep their shops and stalls very dirty, are more subject than others to putrid diseases. Nor are the ship-stewards and their servants, whose business it is to deliver out their provisions to the ships crews, and who spend the most of their time amongst the putrid and rancid effluvia of the places in which those provisions are kept, more subject to putrid fevers than their ship-mates. But whatever be in this, we are well assured that some particular putrid fermentations produce noxious vapours, which, united with those of marshes, render them more pernicious. Hence evidently proceeds the extreme unhealthfulness of a place called *Culpi*, on the eastern bank of the Ganges. The shores hereabouts are full of mud, and the banks covered with trees. Opposite to the place where the ships lie there is a creek, and about a mile from its entrance stands the town of *Culpi*: the ships lie about a mile from the shore. None of the sailors on board the ships stationed at this place enjoyed their health. The burying-ground also contributed not a little to spread the infection. The ground being marshy, the putrid water flowed from the old graves into the new ones, which infected the grave-diggers and those that attended the funerals; and from this cause many were suddenly seized while they were performing the last duty to their companions. This place has ever been remarkable for the unhealthfulness of its air. It was once customary to send some of the Company's servants there to receive the cargoes of the ships, and send them to Calcutta; but so many of them died on this duty, that the Company was at length obliged to dispense with it.

Hence it plainly appears, how apt putrid animal and vegetable substances are to render the effluvia of fenny places more pernicious than they would otherwise be. The reason why great inundations of the Nile and Ganges are followed by a healthy season is, that by this means the putrid animal and vegetable substances dispersed over the contiguous countries are carried off into the sea.—The noxious vapours arising from fens spread but a little way. Dr Lind has often known ships crews at a very little distance from the shore quite free from this disorder. But altho' these marsh miasmata first bring on the disease, yet contagion

gion particularly spreads it, and renders it more epidemic. Thus the Drake East Indiaman continued free from the disorder for two weeks together, when she had no communication with the other ships; whereas, as soon as the disorder was brought on board, many were seized with it within a few days in such a manner as to leave no room to entertain the least doubt concerning its pestilential nature.

Dr Lind of Haflar-hospital has given a very curious and learned account of the appearance of this fever throughout the various parts of the globe. It was very common in England in the years 1765 and 1766, one obvious cause of which was the prevalence of the eastern wind. This wind in England is often said to bring with it a fog from the sea; but the truth of the matter is, that in many places of this island the east-wind frequently raises a copious vapour from water, mud, and all marshy or damp places. To this exhaling quality of the eastern wind Dr Lind hath often been an eye-witness. When the wind changes to the east, the mud sometimes sends up a vapour as thick as smoke; and the doctor hath observed two fish-ponds in his neighbourhood, one of fresh and the other of salt water, which on the approach of an easterly wind sometimes also emit a dense vapour as from a pot of boiling water. In order to view this phenomenon distinctly, the person should stand at about 100 yards distance from the mud or ponds. If the sun shines when the wind changes to the east, he will observe a constant steam of vapours arising out of the ponds, from about five to ten yards in height, while the air about him remains serene. As the vapour or fog arising from other bodies glides along the surface of the earth, and is brought by the easterly wind to the ponds, he will still be able, for some time, to distinguish the vapours ascending perpendicularly out of the ponds from those which are carried in an horizontal direction by the wind; especially if the sun continues to shine, though faintly.

This evaporating quality of the east-wind seems to manifest itself also by its effects both on the thermometer and the human body; for a thermometer hung over a damp piece of ground during the fogs or exhalations arising from it, will often indicate a degree of cold below the freezing point. The chilliness of the body, so sensibly perceived when in this situation, seems to proceed from the same cause, and to produce nearly the same sensations, which the damp arising from the wet floor in a chamber communicates to those who happen to be in it.

Winds are not constant in their effects, as we have sometimes warm weather with a north-wind, and sometimes very little heat with one blowing from the south; so the fogs attending an east-wind are not constant, neither is the evaporation abovementioned at all times to be perceived. It is possible, however, that in all this there may be a deception; and that, instead of supposing the quantity of vapours exhaled to be increased by an easterly wind, the coldness of that wind may be only supposed to condense and render visible the vapours in the air at that time. But even this supposition is liable to great objections, as our coldest north-winds seldom or never produce such an effect, but on the contrary are attended with dry and serene weather.

Be this as it will, however, an east-wind is usually accompanied with a cold, damp, and unwholesome vapour, which is observed to affect the health both of animals and vegetables, and in many places to produce obdurate intermitting fevers, as also to occasion frequent relapses. In particular spots of the low damp island of Portsea, the ague frequently prevails during the autumnal season, and in some years is much more frequent and violent than in others. It is also observable, that this disease always attacks strangers, or those who have formerly lived on a drier soil, and in a more elevated situation, with greater severity than those who are natives of the island.

The year 1765 was remarkable, not only for the long continuance of the easterly winds, but for an excessive degree of heat, which produced a more violent and general rage of those diseases than had been known for many years before. In the month of August, the quicksilver in Fahrenheit's thermometer often rose to 82° in the middle of the day. This considerable addition of heat, together with the want of refreshing rains, greatly spread the fever, increased its violence, and even changed its form in many places. At Portsmouth, and throughout almost the whole island of Portsea, an alarming continual or remitting fever raged, which extended itself as far as Chichester. At the same time, the town of Gosport, though distant only one mile from Portsmouth, enjoyed an almost total exemption from sickness of every kind; whereas in the neighbouring villages and farm-houses, a mild regular tertian ague distressed whole families. The violence of the fever, with its appearances in a continued remitting or intermitting form, marked in some measure the nature of the soil. In Portsmouth the symptoms were bad, worse at Kingston, and still more dangerous and violent at a place called *Half-way Houses*; a street so called, about half a mile from Portsmouth, where scarcely one in a family escaped this fever, which generally made its first attack with a delirium. In the large suburb of Portsmouth called the *Common*, it seemed to rage with more violence than in the town, some parts excepted; but even whole streets of this suburb, together with the houses in the dock-yard, escaped its attack.

The marines, who were three times a-week exercised early in the morning on South Sea beach, suffered much from the effect of the stagnant water in an adjoining morass. Half a dozen of them were frequently taken ill in their ranks when under arms; some being seized with such a giddiness of their head, that they could scarcely stand; while others fell down speechless, and upon recovering their senses complained of a violent head-ach. When such patients were received into the hospital, it was observed that some few had a regular ague, but that far the greater number laboured under a remitting fever, in which sometimes indeed there was no perceptible remission for several days. A constant pain and giddiness of the head were the most inseparable and distressing symptoms of this disease. Some were delirious, and a few vomited up a quantity of bile; but in all the countenance was yellow. A long continuance of the fever produced a dropsy or jaundice, or both. Even a slight attack reduced the most robust constitution to a state of extreme debility; and this weakness, together with the giddiness, continued

continued for a long time after the fever. A scabby eruption now and then made its appearance on the lips and the corners of the mouth: but dryitchy spots over the whole body, resembling much the common itch, and seeming to partake of the nature of that disease, were more frequently observed in the patients at Portsmouth, where there was not the least reason to suspect any infection.

Such is the appearance of the remitting fever occasioned by marsh miasmata in England. In the Netherlands its symptoms are not much different. Dr Wind informs us, that at Middleburg, the capital of West Zealand, a sickness generally reigns towards the latter end of August, or the beginning September, which is always most violent after hot summers. It commences after the rains which fall in the end of July; the sooner it begins the longer it continues, and it is only checked by the coldness of the weather. Towards the end of August and the beginning of September it is a continual burning fever, attended with a vomiting of bile, which is called the *gall-sickness*. This fever, after continuing three or four days, intermits, and assumes the form of a double tertian; leaving the patient in a fortnight, or perhaps sooner. Strangers that have been accustomed to breathe a dry pure air do not recover so quickly. Foreigners in indigent circumstances, such as the Scots and German soldiers, who are garrisoned in the adjacent places, are apt after those fevers to have a swelling in their legs and a dropsy; of which many die.

These diseases, the Doctor observes, are the same with the double tertians common within the tropics. Such as are seized with the gall-sickness have at first some flushes of heat over the body, a loss of appetite, a white foul tongue, a yellow tinge in the eyes, and a pale colour in the lips. Such as live well, drink wine, and have warm clothes and good lodgings, do not suffer so much during the sickly season as the poor people; however, these diseases are not infectious, and seldom prove mortal to the natives.

Sir John Pringle observes, that the prevailing epidemic of autumn in all marshy countries, is a fever of an intermitting nature, commonly of a tertian form, but of a bad kind; which, in the dampest places and worst seasons, appears as a double tertian, a remitting, or even an ardent fever. But, however these fevers may vary in their appearance according to the constitution of the patient and other circumstances, they are all of a similar nature. For though, in the beginning of the epidemic, when the heat or rather the putrefaction in the air is the greatest, they assume a continued or a remitting form, yet by the end of autumn they usually terminate in regular intermittents.

In Zealand, where the air is more corrupted than in other parts of the Netherlands, this distemper, as we have already observed, is called the *gall-sickness*; and indeed both the redundancy and depravation of the gall is sometimes so great, that it has been generally ascribed to the corruption and overflowing of that humour. But though it cannot with justice be said to originate from corrupted gall or bile, it is certain that the disease may be continued, and the symptoms aggravated, by an increased secretion and putrefaction of the bile occasioned by the fever. In proportion to the coldness of the season, to the height and dryness of the ground, this distemper is milder, remits or intermits

more freely, and removes further from the nature of a continued fever. The higher ranks of people in general are least liable to the diseases of the marshes; for such countries require dry houses, apartments raised above the ground, moderate exercise, without labour in the sun or evening damps, a just quantity of fermented liquors, plenty of vegetables, and fresh meats. Without such helps, not only strangers, but the natives themselves are sickly, especially after hot and close summers. The hardiest constitutions are very little excepted more than others; and hence the British in the Netherlands have always been subject to fevers.

By this distemper the British troops were harassed throughout the whole of the war from 1743 to 1747. It appeared in the month of August 1743; the paroxysms came on in the evening, with great heat, thirst, a violent headach, and often a delirium. These symptoms lasted most of the night, but abated in the morning, with an imperfect sweat, sometimes with an hæmorrhage of the nose or a looseness. The stomach from the beginning was disordered with a nausea and sense of oppression, frequently with a bilious and offensive vomiting. If evacuations were either neglected, or too sparingly used, the patient fell into a continued fever, and sometimes grew yellow as in a jaundice. When the season was farther advanced, this fever was attended with a cough, rheumatic pains, and sizy blood. The officers being better accommodated than the common men, and the cavalry who had cloaks to keep them warm, were not so subject to it: and others who belonged to the army, but lay in quarters, were least of all affected; and the less in proportion to their being little exposed to heats, night-damps, and the other fatigues of the service.

In this manner did the remitting fever infect the army for the remaining years of the war; and that exactly in proportion to their distance from the marshy places, of which we have several notable instances in Pringle's observations. In Hungary the same disease appears with still more violence, and is readily complicated with fevers of a truly pestilential nature, by which means it becomes extremely dangerous. This country is acknowledged to be the most sickly climate in Europe, and indeed as bad as any in the world. Here it was where the crusaders, in only marching through the country to invade Asia, often lost half their number by sickness; and where the Austrians not long since buried, in a few years, above 40,000 of their best troops, who fell a sacrifice to the malignant disposition of the Hungarian air. The reason of this uncommon malignity is, that Hungary abounds with rivers, which, by often overflowing, leave that low flat country overpread with lakes and ponds of stagnating water, and with large unwholesome marshes. So great is the impurity of these stagnant waters, that by them the rivers, even the Danube, whose course is slow, become in some places corrupted and offensive. The air is moist, and in summer quite sultry. In the nights of harvest, Kramer tells us, it was so very damp, that the Austrian soldiers could not secure themselves from the moisture even by a triple tent-covering. Here epidemical distempers begin constantly to rage during the hottest months of the year; which are July, August, and September: and these complaints, according to the observations of the physician above-mentioned, are



the same with those which are epidemic upon the coast of Guinea, and in the sickly climates of the East and West Indies, of which malignant fevers of the remitting and intermitting kind are the most common and dangerous.

The heat of the sun in Hungary, according to the same author, is more intense than in any other country of Europe; and in proportion to the heat is the pestilential quality of the marshy exhalations. It is constantly observed, that the nearer any city or fort is to a morass, or a large river with foul and oozy banks, the more unhealthy are the inhabitants. At such seasons and places, the air swarms with numberless insects and animalcules, a sure sign of its malignant disposition; and the hotter the summer, the more frequent and mortal are the diseases. In short, this country, on account of its unhealthiness, has been termed *the grave of the Germans*; and, in Italy, the Campania of Rome is almost equally unhealthy. Lan- ciscus, physician to Pope Clement XI. furnishes us with a very striking instance of the malignant quality of the air of Campania. Thirty gentlemen and ladies of the first rank in Rome having made an excursion, upon a party of pleasure, towards the mouth of the Tyber, the wind suddenly shifting, blew from the south over the putrid marshes, when 29 were immediately seized with a tertian fever, only one escaping.

The island of Sardinia is annually visited with an epidemical sickness, which rages from June to September, and is called by the natives the *intemperie*. In some years there is a want of rain for four or five months; and then it is that this sickness exerts its utmost violence, being always more fatal in some places than in others, and in particular to strangers. Of this the British had a severe proof in 1758.—Admiral Broderick, in the Prince ship of war, anchored in the bay of Oristane, where 27 of his men, sent ashore on duty, were seized with the epidemical distemper of this island; twelve of them in particular, who had slept on shore, were brought on board delirious. All of them in general laboured under a low fever, attended with great oppression on the breast and at the pit of the stomach, a constant retching, and sometimes a vomiting of bile; upon which a delirium often ensued. These fevers changed into double tertians, and terminated in obdurate quartan agues. It is worthy of remark, that in this ship, which lay only two miles from the land, none were taken ill but such as had been on shore, of whom seven died. The prior of a convent, making a visit to the English officers, informed them, that the intemperies of the island was a remitting or intermitting fever, and that he himself had suffered several attacks of it. Sardinia was formerly so remarkable for its unwholesome air, that the Romans used to banish their criminals thither; and it is at present but thinly peopled, owing to the mortality occasioned by this annual sickness. For although it is about 140 miles long, and in several places 75 miles broad, yet it is computed that the whole number of its inhabitants does not exceed 250,000: an inconsiderable number, when compared with the inhabitants of the lesser, but comparatively more healthful island of Corsica; though even there the French lost a number of their troops by intermitting and remitting fevers. In the island of Minorca too, Dr Cleghorn informs us, that fevers of this kind prevail exceedingly;

that their types are various, their symptoms violent, the intermissions fallacious, and that they frequently and suddenly prove fatal. It is more than probable, he adds, from the accounts of several physicians and travellers, that epidemical tertians are not wholly confined to the coasts and islands of the Mediterranean, but that they are equally frequent and destructive in many other parts of the globe; and perhaps may be deemed the anniversary autumnal distempers of moist hot countries in the world. And though in the mild climate of Britain, a tertian may always easily be cured when once it is discovered; yet, in warm climates, such is the rapid progress of the distemper, that it is necessary to know it in the very beginning, which is very difficult for those who have never seen any but the tertians usually met with in Britain.

From this gentleman's account of Minorca, however, it doth not appear why that island should be so much infested with fevers of this kind, seeing it is far from being a marshy country; nay, on the contrary, is very dry. The fourth-wind, he observes, is very unhealthy; and it is the prevalence of this wind which brings on the fever: but still the difficulty is not removed, because the sea-air is so far from bringing on such dangerous diseases, that it is one of the greatest preservatives against them when it can be had. As to the moisture which must necessarily accompany an insular situation, that cannot reasonably be admitted as a cause of this or any other disease. In the Medical Observations we find a paper on a subject very similar to the present, namely, the mischiefs produced by lying in damp sheets, or being exposed to moist vapour. Our author tells us, that he hardly knows a distemper the origin of which hath not by some been ascribed to lying in a damp bed, or sitting in a wet room; and yet he does not know any one which will certainly be produced by these causes, and people frequently expose themselves to such causes without suffering any ill effects. "It must be owned indeed, (says he), that the vapours arising from the bilge-water of ships tend to produce the scurvy. The swampy plains also near the mouths of great rivers which are often overflowed, and low grounds which cannot readily be drained, and those tracts of land where the thickness and extent of the woods keep the ground moist and half putrid for want of ventilation, are destructive to the neighbouring inhabitants, by occasioning obdurate intermittents in the colder climates, and pestilential fevers in the hotter regions. But all this mischief arises not merely from moisture, but from an unventilated and putrid moisture; for the insensibility of mere wetness, untainted with putridity, may be reasonably inferred from the following considerations. The air is often fully saturated with moisture, and could not be more filled by the vapours arising from a chamber covered with water; and yet neither is any epidemical distemper produced by it, nor are those remarkably aggravated with which the sick happen at that time to be afflicted. The air from rivers and from the sea is probably more replenished with vapours than inland countries cleared of their woods: yet the most celebrated of the ancient physicians recommended the bank of a running river for the situation of a house, on account of its peculiar healthfulness; and many invalids are sent by the modern physicians

practise physicians to the sea-side, only for the benefit of the sea-air.

"Where the sailors are cleanly, and not too much crowded, they are often as healthy during long voyages at sea, as they would have been upon any part of the land. Venice is not observed to be less healthy than London or Paris.

"Those who are much disposed to sweat, lie many hours in bed-clothes impregnated probably with a less wholesome moisture than would have been left in the sheets half-dried after washing; and I have not yet had reason to think that any remarkable injury was done to the health by the continuance of such sweats almost every night for weeks, and for months, except what arose from the too great copiousness of this evacuation.

"Children, and such as are troubled with the stone, and those who, from other infirmities or age, constantly wet their beds with their urine, do not appear to suffer in their health on this account.

"It is a common practice, in some disorders, to go to bed with the legs or arms wrapped in linen cloths thoroughly soaked in Malvern water, so that the sheets will be in many places as wet as they can be; and I have known these patients and their bedfellows receive no harm from a continuance of this practice for many months. Nor can it be said that the Malvern water is more innocent than any other water might be, on account of any ingredients with which it is impregnated; for the Malvern water is purer than that of any other springs in England which I ever examined or heard of.

"The greatest valetudinarians do not scruple to sprinkle lavender-water upon their sheets; and yet, when the spirit is blown off, there is left what is as truly water, as if it had been taken from the river.

"Is it observed, that laundresses are peculiarly unhealthy above other women, though they live half their time in the midst of wet linen, in an air fully saturated with vapours? Many other employments might be mentioned, the persons occupied in which are constantly exposed to wet floors or pavements, or to be surrounded with watery vapours, or to have their clothes often wet for many hours together.

"Is it the coldness of wet linen which is feared? But shirts and sheets, colder than any unfrozen water can be, are safely worn and lain in by many persons, who, during a hard frost, neither warm their shirts nor their sheets.—Or does the danger lie in the dampness? But then how comes it to pass, that a warm or cold bath, and long-continued fomentations, can be used, without the destruction of those who use them?—Or is it from both together? Yet we have long heard of the thickness and continuance of the cold fogs in the seas north-west of England, but have never yet been told of any certain ill effect which they have upon those that live in these countries."

With regard to the causes of fevers, however, Dr Lind is of opinion, that noxious vapours arising from the earth are for the most part to be blamed. Even in countries seemingly dry, and where violent rains are not frequent, he thinks that the air may load itself with putrid exhalations from the ground; and that, except in the burning deserts of Arabia or Africa, people are nowhere exempt from diseases occasioned by putrid moisture. In most of the hot countries, however, the pernicious effects of the pu-

trid vapours are by no means equivocal. In Guinea, they seem to be more extraordinary than any where else in the world; neither indeed can it be supposed that a hot and moist atmosphere can be without putrescency. It may in general be remarked, that in sultry climates, or during hot weather, in all places subject to great rains, where the country is not cleared and cultivated, but is overrun with thickets, shrubs, or woods, especially if there are marshes or stagnating waters in the neighbourhood, sickness may be dreaded, and the remitting fever of which we now treat. The fens, even in different countries of England, are known to be very prejudicial to the health of those who live near them, and still more so to strangers; but the woody and marshy lands in hot countries are much more pernicious to the health of Europeans. In all those unhealthy places, particularly during fogs or rains, a raw vapour, disagreeable to the smell, arises from the earth, and especially in the huts or houses. But of all the vapours which infect the torrid zone, the most malignant and fatal are the *harmattans*: They are said to arise from the conflux of several rivers in the king of *Dormes*'s dominions at Benin, (the most unwholesome part of Guinea), where travellers are obliged to be carried on mens backs for several days journey, through swampy grounds, and over marshes, amidst stinking ooze, and thickets of mangrove trees which are annually overflowed. These vapours come up the coast, to a surprising distance, with the south-east and north-east winds: and it has been observed, that, in their progress, they have often changed both the course of the winds and of the sea-currents. The times of their appearance at Cape Coast are the months of December, January, or February. The north-east and south-east winds are always unhealthy, but particularly so during the harmattan season. Some years this vapour is scarcely perceptible; but in others it is thick, noxious, and destructive to the blacks as well as whites. The mortality is in proportion to the density and duration of the fog. It has a raw putrid smell; and is sometimes so thick, that a person or house cannot be discerned though it, at the distance of 15 or 20 yards: and it continues so for 10 or 14 days; during which it opens the seams of ships, splits or opens the crevices of wood as if shrunk or dried with a great fire, and destroys both man and beast.—In the year 1754 or 1755, the mortality occasioned in Guinea by this stinking fog was so great, that in several negro towns the living were scarce sufficient to bury the dead. Twenty women brought over from Holland by a new governor to the Castle *del Mina*, perished, together with most of the men in the garrison. The gates of Cape Coast Castle were shut up for want of centinels to do duty; the blacks dying at this time as well as the white people. It is lucky that it is only in some years that *harmattans* are so very thick and noxious, otherwise that part of the country would be depopulated. It is observed that all fogs are extremely unhealthy in those parts, particularly before and after the rainy season; but the above account of the *harmattans* appeared so very extraordinary and incredible to some of Dr Lind's readers, that he thought proper to publish a further corroboration of the facts above-mentioned. "A gentleman, (says he), who had

long resided at Cape Coast castle, informed me, that during the time of this fog, being in the upper chambers of the fort, the boards of the floor shrunk so much, that he could discern the candles burning in the apartments below him (there are no plaster ceilings used in these hot countries), and that he could then even distinguish what people were doing in the apartments below; the seams of the floor having opened above half an inch, while the fog lasted, which afterwards, upon its being dispelled, became close and tight as before."

In this country the rains and dews seem to be possessed of qualities almost equally pernicious with the fogs. Thus much is certain, that in Guinea, many of the principal negroes, and especially of the mulattoe Portuguese, take the utmost precaution to avoid being wet with those rains, especially such as fall swift. At the setting in of the rainy season, they generally shut themselves up in a close well-thatched hut, where they keep a constant fire, smoke tobacco, and drink brandy, as preservatives against the noxious quality of the air at that time. When wet by accident with the rain, they immediately plunge themselves into salt-water if near it. Those natives generally bathe once a-day, but never in the fresh-water rivers when they are overflown with the rains: at such times they prefer for that purpose the water of springs. The first rains which fall in Guinea are commonly supposed to be the most unhealthy. They have been known, in 48 hours, to render the leather of the shoes quite mouldy and rotten; they stain clothes more than any other rain; and soon after their commencement, even places formerly dry and parched swarm with frogs. At this time skins, part of the traffic of Senegal, quickly generate large worms; and it is remarked, that the fowls, which greedily prey on other insects, refuse to feed on these. It has been farther observed, that woollen cloths wet in those rains, and afterwards hung up to dry in the sun, have sometimes become full of maggots in a few hours.—It is also probable, that as in some of those countries the earth, for six or eight months of the year, receives no moisture from the heavens but what falls in dews, which every night renew the vegetation, the surface of the ground in many places becomes hard and incrustated with a dry scurf, which pens up the vapours below: until by the continuance of the rains for some time, this crust is softened, and the long pent up vapours set free. That these dews do not penetrate deep into the earth is evident from the constant dryness and hardness of such spots of ground in those countries as are not covered with grass and other vegetables. Thus the large rivers in the dry season being confined within narrow bounds, leave a great part of their channel uncovered, which having its moisture totally exhales becomes a solid hard crust; but no sooner the rains fall, than by degrees this long parched up crust of earth and clay gradually softens, and the ground, which before had not the least smell, begins to emit a stench, which in four or five weeks becomes exceedingly noisome, at which time the sickness is generally most violent.

This sickness, however, is not different from the remitting fever which hath been described under so many various forms and names. An inflammatory

fever is seldom observed, during the season of sickness, in this part of the world; and we shall conclude our description of the *amphimerina paludosa* with some extracts from the surgeon's journal of a ship that sailed up the rivers of Guinea.

"On the 5th of April we sailed up the river of Gambia, and found all the English in the fort in perfect health. The surgeon of the factory informed me, that a relaxation of the stomach, and consequently a weakened digestion, seemed to bring on most of the diseases so fatal to Europeans in the sickly season. They were generally of a bilious nature, attended with a low fever, sometimes of a malignant, at other times of a remitting kind.—On the 12th of April, after sailing 30 miles up the river St Domingo, we came to Catchou, a town belonging to the Portuguese, in Lat. 20° N.—In this town were only four white people, the governor and three friars. The number of whites in the trading ships were 51. One morning, towards the latter end of April, a little rain fell. On the 13th of May there was a second shower, accompanied with a tornado. One the 18th of May it rained the whole day; and the rain continued, with but short intervals, until the beginning of October.

"In the month of June, almost two thirds of the white people were taken ill. Their sickness could not be well characterised by any denomination commonly applied to fevers: it however approached nearest to what is called a *nervous fever*, as the pulse was always low, and the brain and nerves seemed principally affected. It had also a tendency to frequent remissions. It began sometimes with a vomiting, but oftener with a delirium. Its attack was commonly in the night; and the patients, being then delirious, were apt to run into the open air. I observed them frequently recover their senses for a short time, by means of the heavy rain which fell upon their naked bodies. But the delirium soon returned: they afterwards became comatose, their pulse sunk, and a train of nervous symptoms followed; their skin often became yellow; bilious vomitings and stools were frequent symptoms. The fever reduced the patient's strength so much, that it was generally six weeks or two months before he was able to walk abroad. A consuming flux, a jaundice, a dropsy, or obstructions in the bowels, were the consequences of it. Of 51 white men, being the companies of four ships which were at Catchou, one third died of the fever, and one third more of the flux, and other diseases consequent upon it; and of these not one was taken ill till the rains began.

"I believe, on the whole fate of the earth, there is scarce to be found a more unhealthy country than this during the rainy season: and the idea I then conceived of our white people was by making a comparison of their breathing such a noxious air, with a number of river-fish put into stagnating water; where, as the water corrupts, the fish grow less lively, they droop, pine away, and many die.

"Thus some persons became dull, inactive, or slightly delirious, at intervals; and, without being so much as confined to their beds, they expired in that delirious and comatose state in less than 48 hours, after being in apparent good health. The white people in general became yellow; their stomach could not receive much food without loathing and retchings. Indeed it is no wonder



practitioner wonder that this sickness proved so fatal, that recoveries from it were so tedious, and that they were attended with fluxes, dropics, the jaundice, ague-cakes, and other dangerous chronic disorders. It seemed more wonderful to me that any white people ever recover, while they continue to breathe so pestiferous an air as that at Catchou during the rainy season. We were, as I have already observed, thirty miles from the sea, in a country altogether uncultivated, overflowed with water, surrounded with thick impenetrable woods, and over-run with slime. The air was vitiated, noisome, and thick; inasmuch that the lighted torches or candles burnt dim, and seemed ready to be extinguished: even the human voice lost its natural tone. The smell of the ground and of the houses was raw and offensive; but the vapour arising from putrid water in the ditches was much worse. All this, however, seemed tolerable, when compared with the infinite numbers of insects swarming every where, both on the ground and in the air; which, as they seemed to be produced and cherished by the putrefaction of the atmosphere, so they contributed greatly to increase its impurity. The wild bees from the woods, together with millions of ants, over-ran and destroyed the furniture of the houses; at the same time, swarms of cockroaches often darkened the air, and extinguished even candles in their flight; but the greatest plague was the musketoes and sand-flies, whose incessant buzz and painful stings were more insupportable than any symptom of the fever. Besides all these, an incredible number of frogs on the banks of the river made such a constant and disagreeable croaking, that nothing but being accustomed to such an hideous noise could permit the enjoyment of natural sleep. In the beginning of October, as the rains abated, the weather became very hot; the woods were covered with abundance of dead frogs, and other vermin, left by the receds of the river; all the mangroves and shrubs were likewise overpread with stinking slime."

After so particular a description of the remitting fever in many different parts of the world, we presume it will be needless to take notice of any little varieties which may occur in the warm parts of America, as both the nature and cure of the distemper are radically the same: neither shall we lengthen out this article with further descriptions of remitting fevers from the works of foreign authors, as, from what we have already said, their nature cannot well be mistaken.

*Cure.* The great difficulty in the cure of remitting fevers arises from their not being simple diseases, but a complication of several others. Fevers, properly speaking, have but three or four different appearances which they can assume without a complication. One is, when they are attended with a phlogistic diathesis; another is, when they assume the form of genuine intermittents; a third is, when they produce a great debility of the nervous system; and the fourth is, when, along with this debility, there is also a rapid tendency to putrefaction. If, therefore, all these species happen to make an attack at once, the most dangerous fever we can imagine will be produced; and however contrary it may be to our theories to admit the possibility of such an attack, the truth of the fact is too often confirmed by fatal experience. In the beginning of remittent fevers, for instance, the symptoms indicate a high degree of inflammation; but if the practitioner at-

tempts to remove this inflammation by bloodletting or other evacuations, the pulse sinks irrecoverably, and the person dies with such symptoms as shew that the nervous system hath been from the beginning greatly affected; at the same time that the high stimulants and cordials, or the bark, which would have conquered the nervous part of the disease, increase the inflammatory part of it to such a degree, that, by a too early exhibition of them the patient also dies, but after another manner.

In the remitting fever of the East Indies, Dr Lind of Edinburgh formed the following indications of cure.

1. To allay the violence of the fever.
2. To evacuate the putrid humours, and take great care to prevent the body from inclining to putrefaction.
3. To keep up the strength of the patient as much as possible during the disorder.
4. To lose no time in preventing the return of the paroxysm.

To allay the violence of the fever, every thing that can contribute to increase it ought to be carefully avoided or removed; such as great heat, too strong a light falling on the eyes, noise, and motion. If during the paroxysm the head and loins are affected with violent pains, the pulse is full and hard, and the heat intense, bleeding may be used, but with the greatest caution: for, however useful this operation may be in cold climates, the success of it in warm ones is so far from being certain, that the lives of the patients have been often very much endangered, nay even destroyed, by it. Dr Badenoch, and the surgeon of the Portsmouth, endeavoured each of them to relieve two patients by blood-letting; and the consequence was, that each of them lost one patient. Dr Lind bled two patients; one of whom was Mr Richardson, the first mate of the ship, who complained of a most violent pain in his head, with a full hard pulse. About four or five ounces of blood were taken from him, by which he was greatly relieved: nor was the cure retarded by it; nay, the fever afterwards became less irregular. At the time the other patient was bled, the disease was exceedingly frequent and violent. He was so earnest for bleeding, that he fired all the rest with the same desire, swearing, that, by refusing them this only remedy, every one of them would be sent to their graves. To quiet them therefore, and get rid of their importunities, the Doctor complied with their request, and took about five or six ounces from him who had been the first to require it. The consequence was, that he immediately lost his strength; and in less than an hour, during which time he made his will, was carried off by the next fit. It is proper, however, to observe, and indeed the Doctor himself makes the observation, with regard to this patient, that he was bled at an improper time, namely, between the fits; whereas, had he been bled in the hot fit, it is possible he might have been relieved: and here he quotes the authority of Cleghorn and Pringle.

As Dr Cleghorn practised in a very hot country, his observations must in the present case have greater weight than that of Pringle, who practised in a colder one. The former acquaints us, that if he was called in early enough, he always used to take away some blood, unless there was a strong contra-indication, from people of all ages; namely, from robust adults, ten or twelve ounces; from others a smaller quantity, in

proportion to their strength and years. And further, if a violent head-ach, obitinate delirium, and great heat or pains of the bowels, were urgent, the bleeding was repeated within a day or two. By this seasonable evacuation, he found the vehemence of all the paroxysms somewhat diminished; the apyrexies became more complete; the operation of emetics and cathartics rendered safer and more successful; and the terrible symptoms which happened about the height of the distemper, such as raving *febris*, difficulty of breathing, inflammations of the abdominal viscera, &c. were either prevented or mitigated. But if the fever had continued for some time before he was called, and the mass of blood appeared to be too much melted down or inclined to a putrid dissolution, he either abstained from bleeding entirely, or took away a very small quantity, though some importunate symptoms might seem to require a larger evacuation. As to the time of performing the operation, he acquaints us, that it is safe enough, except when the cold fit lasts or is soon expected, or while the skin is covered with critical sweats; and that he usually opened a vein in the beginning of the hot fit; by which means the sick were relieved, the immoderate heat of the body, which is often productive of fatal effects, was diminished, and the critical sweats brought on sooner and in greater abundance.

But though Dr Lind found venesection to be of such pernicious tendency in his patients, cooling acidulated liquors were of the utmost service, as they corrected the putrid humours, lessened the heat and thirst, and of course prevented the fever from arriving at so great an height as it would otherwise have done. Those cooling liquids are the best which are made up with some farinaceous substance, as they most easily unite with our fluids. Fossile acids too, and crystals of tartar, especially the latter, are of considerable use, not only in this but in other fevers. The neutral salts, prepared with the juice of lemons, were likewise given with success during the heat of the fever. They lessen the nausea, the fits become more regular, and the remissions more full; and they are particularly grateful when given in a state of effervescence. The good effects of these draughts we are in a great measure to ascribe to the antiseptic quality of the fixed air extricated from them during the effervescence; of which we shall speak more fully when treating of the typhous fevers.

During the remission, it is proper to evacuate the putrid humours by small doses of ipecacuanha, or rather tartar emetic. The tartar emetic indeed appears to be endowed with some kind of febrifuge virtue, which Dr Cullen thinks is owing to its relaxing the febrile spasm taking place in the capillary vessels, as shall be fully explained when we come to treat of continued fevers. But should there appear any symptoms of a topical inflammation in some of the abdominal viscera, a thing which never happens unless the disorder has been of some standing, vomiting is to be avoided, and we are to depend upon purgatives alone for the evacuation of the putrid bile, which are always useful in the cure of this disorder. But all acrid and strong purgatives are to be carefully avoided, and only the mild antiseptic ones made use of, such as crystals of tartar, or tamarinds made up with manna or with

Glauber's salt.

Under the article GALL, we have observed, from Dr Percival, the effect which vegetable acids have in sweetening putrid bile; whence it seems probable, that a liberal use of these acids would be much more serviceable than a repetition of any kind of purgatives. Though in these diseases there is a great quantity of putrescent bile collected in the body, yet it seems much more probable that this is the *effect* rather than the *cause* of the disorder; and therefore, though we carry off the quantity collected ever so often, more of the same kind will still be produced by the putrescent disposition of the other juices, at the same time that the strength of the patient must necessarily be diminished by repeated evacuations, when it ought rather to be kept up by all possible means. We ought well to observe, however, that the mineral acids have not that property of sweetening putrid bile which the vegetable ones have; and therefore the same relief will not be given by them which might reasonably be expected from vinegar or lemon-juice.

In order to keep up the strength of the patient, good food is absolutely necessary. Dr Lind allowed the sick small messes of panada made with boiled rice and barley mixed with currants or raisins and prunes, seasoned with sugar and a little wine, especially claret. During the paroxysms, they had gruel made of flour and rice, with sugar and the juice of acid fruit; and when the fit went off, a little wine was added to this mixture.

The shirts and bedding must be very often changed and well aired; their stools, and all filth and nastiness, are to be immediately removed; the places where they are lodged should be well aired and frequently sprinkled with vinegar; and, in the last place, the sick must be exceedingly well nursed. Blisters, according to Dr Lind, should never be used till the fever has been of long continuance, or the spirits and pulse of the patient have begun to flag. But here our author has implicitly followed Dr Huxham, whose theory concerning the use of blisters is now found to be erroneous. According to that celebrated author, blisters are capable of doing considerable hurt in all cases where there is a tendency to inflammation, by increasing the motion of the fluids and the oscillatory power of the vessels, both of which are already too great. They are also improper, according to him, where there is a considerable tendency of the fluids to putrefaction; because he supposes the salts of these fluids to operate in the same manner with volatile alkalis, that is, by dissolving and putrefying the blood still farther. But Sir John Pringle hath shown, that, in inflammatory fevers as well as those of the putrid kind, both blisters and volatile salts may be of service; the latter, particularly, he hath experimentally proved to be so far from promoting putrefaction, that they are exceedingly strong antiseptics.

In the East Indies, Dr Lind found it altogether necessary to exhibit the bark in large quantities, and as early as possible. By this method he not only secured the patient from the imminent danger of death to which he was exposed at every fit, but likewise conquered those obstructions which were apt to ensue in the abdominal viscera, and which are to be attributed to the continuance of the disorder, and not to the bark employed to cure it. He always gave the bark

PRACTICE bark during the second remission, as all his care was during the first to cleanse the primæ viæ. He observes, however, that it is to no purpose to give the bark till the necessary purgations are over; but assures us, that it never fails, unless, from the coming on of a vomiting or diarrhœa, it cannot be taken in sufficient quantities before the return of a paroxysm. To prevent the medicine from vomiting or purging, he mixed a few drops of liquid laudanum with every dose of it. Half a drachm was given every half hour in some convenient vehicle, beginning as soon as the fever had considerably abated, and the pulse was returned nearly to its natural state; both which generally happened before the sweats were over. An ounce of the bark was sometimes found too little to check the fever, but an ounce and a half never failed. It must be continued daily in small doses till the patient has recovered his strength, and then a greater quantity given, especially at the season when the rivers overflow the country.

Dr Pringle found the autumnal remittents in the Netherlands complicated with a great many inflammatory symptoms; for which reason it was generally found necessary to open a vein in the beginning. The vernal and later autumnal remitting fevers are accompanied with pleuritic and rheumatic pains from the coldness of the weather, and on that account require more bleeding. A physician unacquainted with the nature of the disease, and attending chiefly to the paroxysms and remissions, would be apt to omit this evacuation entirely, and give the bark too soon, which would bring on a continued inflammatory fever. In these countries a vein may be safely opened either during the remission or in the height of a paroxysm, and our author also found good effects resulting from bleeding in the hot fits of the marsh-fever, even after it had almost come to regular intermissions. After bleeding, a purgative was usually exhibited, of which he gives us the following formula.

R. Infusi senæ commun. ʒiij.

Elect. Lenitiv. ʒi.

Nitr. pur. ʒi.

Tinct. sen. ʒvi. M.

Of this only one half was taken at once; and if it did not operate twice in four hours, the remainder was then taken. This potion agreed with the stomach, purged plentifully, and therefore was a very useful composition. Next morning, when there was almost always some remission, he gave one grain of emetic tartar rubbed with twelve grains of crabs-eyes, and repeated the dose in two hours, if the first had little or no effect; or at any rate in four hours. This medicine was intended not only to vomit, but also to operate by stool, and excite a sweat. If these evacuations were procured, the fever generally became easier, and was even sometimes cured. This he prefers to the ipecacuanha, and therefore in the latter years of his practice disused that root entirely. The same medicine was repeated next day or the day following; or if not, a laxative clyster was thrown in: and this method was continued till the fever either went off altogether, or intermitted in such a manner as to be cured by the bark.

A similar method was followed by Dr Huck in the remitting fevers of the West Indies and North America. In the beginning he let blood; and in the first

remission gave four or five grains of ipecacuanha, with from half a grain to two grains of emetic tartar. This powder he repeated in two hours, taking care that the patient should not drink before the second dose; for then the medicine more readily passed into the bowels after it had operated by vomiting. If after two hours more the operation either way was small, he gave a third dose, which commonly had a good effect in opening the first passages; and then the fever either went quite off, or intermitted in such a manner as to yield to the bark. On the continent, he found little difficulty after the intermission; but in the West Indies, unless he gave the bark upon the very first intermission, tho' imperfect, the fever was apt to assume a continued and dangerous form.

In the remitting fevers of hot countries, however, it must be observed, that the lancet must in all cases be much more sparingly used than in similar diseases of the colder regions; and we must also be sparing of venesection in those countries where the marsh effluvia are very strong and prevail much. For this reason Dr Lind of Hollar greatly condemns the practice of indiscriminate bleeding when people first arrive in hot climates. The first diseases indeed which occur in a voyage to the southward are for the most part of an inflammatory nature, and owing to a sudden transition from cold to hot weather. This occasions a fulness and distension of the vessels; whence all Europeans, on their first arrival under the tropic, bear evacuations much better than afterwards. The practice of indiscriminate bleeding, however, a number of the ship's company when they first come into a warm latitude, is by no means found to answer the purpose of a preventative. In such cases, indeed, as plainly indicate a plethoric disposition brought on by the heat, blood-letting is certainly useful. The signs of this are a pain and giddiness in the head; a heaviness and dullness of the eyes, which sometimes appear slightly inflamed; there is also commonly a sense of weight and fulness in the breast, the pulse at the same time being quick and oppressed.

But the case is quite different after a longer continuance of sultry weather, and when the constitution is in some measure habituated to the hot climate. For it is then observed, that the symptoms of inflammations in the bowels, even the most dangerous, are not near so severe in such climates as in cold countries; nor can the patients bear such large evacuations. The physician, however, must take care not to be misled by the apparent mildness of the symptoms: for he will find, notwithstanding such deceitful appearances, that the inflammation makes a more rapid progress in hot countries than in cold, suppurations and mortifications being much more suddenly formed; and that in general all acute distempers come sooner to a crisis in the southern than in colder regions. Hence it is an important rule of practice in those climates, to seize the most early opportunity, in the commencement of all threatening inflammations, to make frequent, though not copious evacuations by blood-letting. For by delay the inflammation swiftly passes from its first to its last or fatal stage; at least an imperfect crisis in such inflammatory fevers ensues, which fixes an obstruction in the viscera extremely difficult to remove.

It is indeed a general maxim with some physicians in.



**PRACTICE** in the West Indies, that in most acute distempers bleeding in that country is prejudicial. This is founded upon a supposition that the crassamentum of the blood is thinned, and the solids greatly weakened, by the heat of the climate. It is therefore objected, that bleeding in such an habit of body weakens the powers of nature, and withdraws the strength which is requisite to support the patient until the crisis of the fever.

This reasoning is partly just; but, like all general maxims, will admit of exceptions. First, with regard to sailors, it is to be remembered, that they are more exposed to quick vicissitudes of heat, cold, damps, and to various changes of the air and weather, than most of the other inhabitants of the Torrid Zone. Add to this, that their intemperance, and the excesses they are apt to fall into whenever it is in their power to commit them, render them more liable to inflammations than any other set of people. Hence their diseases require more plentiful evacuations than the land-inhabitants of those parts of the world, and generally they bear them better. But with regard to the natives of the country, or those who have remained long in it, it must be proper to bleed them very sparingly, making a small allowance for the different seasons of the year, the temperature of the air, and the situation of the places where they reside. Thus, in some parts, even on the island of Jamaica, at particular seasons, the weather is cool; wherefore, in these places, and at such seasons, the inhabitants having their fibres more rigid, and a firmer crasis of their blood, bear venesection much better.

In cold countries the state of the air greatly assists in restoring the impaired spring of the fibres; whereas every thing almost in warm weather, such as heat, moisture, &c. concur to relax and weaken the habit of body. Thus, we may daily see persons in Britain, after having suffered a most severe fit of sickness, recover their strength and spirits in a few days, and in a very short time their natural constitution. But the case is very different in the sultry regions of the Torrid Zone, or indeed in any part of the world where the heat of the season causes the mercury to stand for any length of time at the 77th degree and upwards of Fahrenheit's thermometer. During such an excess of heat, debility after fevers is apt to remain with European constitutions for several months. In Jamaica, the convalescents are sent to the cool summits of the mountains; but a retreat to a more northern climate is often absolutely necessary to recover their wonted tone and vigour of body. It is a well-established observation, that the negroes, and aborigines of the Torrid Zone cannot bear plentiful evacuations by the lancet. They commonly mix the most stimulating poignant spices with their ordinary light food, and this is found by experience suitable to their constitutions.

As proper preventatives for the dangerous fevers of which we are treating, Dr Lind on all occasions recommends the avoiding of stagnant water, or putrid marshes; the use of proper food, cleanliness, and sobriety. Of the propriety of removing from the neighbourhood of those places whose pestilential effluvia produce the disorders, we cannot possibly entertain a doubt; and of the efficacy of proper food in prevent-

ing putrid disorders he gives a remarkable instance in **PRACTICE** the Sheerness man of war, bound to the East Indies. As they went out, the men being apprehensive of sickness in so long a voyage, petitioned the captain not to oblige them to take up their salt provisions, but rather to permit them to live upon the other species of their allowance. It was therefore ordered, that they should be served with salt-meat only once a-week; and the consequence was, that, after a passage of five months and one day, the ship arrived at the Cape of Good Hope without having a single person sick on board. As the use of Sutton's pipes had been then newly introduced into the king's ships, the captain was willing to ascribe part of such an uncommon healthfulness to their beneficial effects; but it was soon discovered, that, by the neglect of the carpenter, the cock of the pipes had been all this while kept shut. This ship remained in India some months, where none of the men, except the boats crews, had the benefit of going on shore; notwithstanding which, the crew continued to enjoy the most perfect state of health; they were, however, well supplied with fresh meat. On leaving India, knowing they were to stop at the Cape of Good Hope, and trusting to a quick passage, and the abundance of refreshments to be had there, they eat their full allowance of salt-meats, during a passage of only ten weeks; and it is to be remarked the air-pipes were now open. The effect of this was, that, when they were arrived at the Cape, 20 of them were afflicted in a most miserable manner with scorbutic and other disorders. These, however, were speedily recovered by the refreshments they met with on shore. Being now thoroughly sensible of the beneficial effects of eating, in these southern climates, as little salt meat as possible when at sea, they unanimously agreed, in their voyage home from the Cape, to refrain from their too plentiful allowance of salt flesh. And thus the Sheerness arrived at Spithead, with her full complement of 160 men in perfect health and with unbroken constitutions; having in this voyage of 14 months and 15 days buried but one man, who died in a mercurial salivation.

Thus we see, that a free and pure air is not a sufficient preservative against a putrescent state of the fluids, without proper food; and, on the other hand, our author gives a very remarkable instance of the inefficacy of the most salutary food to prevent putrid diseases, in a very noxious state of the atmosphere. In the year 1717, at the siege of Belgrade in Hungary, the fever of the country, and the flux, occasioned a most extraordinary mortality among the troops. The dread of these diseases caused every one, as may naturally be supposed, to have recourse to different precautions for self-preservation. Prince Eugene, the commander in chief, had water and the provisions for his table sent him twice a-week from Vienna. The pure stream of the river Kahlenberg was regularly brought to him: he avoided all excesses, and lived regularly, or rather abstemiously; refreshed himself often by eating a cool melon; and mixed his usual wine, which was Burgundy, with water. Yet notwithstanding his utmost care, he was seized with a dysentery; which would have quickly put an end to his life, had not the speedy conclusion of that campaign permitted him to make quick retreat.

At this unhealthy season, when hardly one imperial officer, much less their several domestics, escaped those malignant diseases, the renowned Count Bonneval and his numerous retinue continued in perfect health, to the surprise, or, to use the words of Dr Kramer, to the envy of all who beheld him. The only precaution he used was to take, two or three times a-day, a small quantity of brandy in which the bark was infused; and he obliged all his attendants and domestics to follow his example. It is no less remarkable that the count, placing his certain preservation in the use of this single medicine, lived for many years afterwards in the most unhealthy spots of Hungary, without any attack, or apprehension of disease; and continued to enjoy a perfect state of health during the hottest and most sickly seasons. And thus, with an unbroken and sound constitution, which is seldom the case of those who reside long in such climates, he lived to a great age. There is an instance produced by the same author of a whole regiment in Italy having been preserved by the use of the bark from the attack of these malignant diseases, viz. the flux and *bilious* fever, as it is frequently called, when the rest of the Austrian army, not pursuing that method, became greatly annoyed with them.

The intemperance and irregular living of those Europeans who visit the hot climates is frequently accused as the cause of their destruction; but, our author thinks, without sufficient reason: for though intemperance will make the body more liable to receive such diseases, it will not bring them on. It must by no means, however, be imagined, that in these climates Europeans may with impunity be guilty of excesses in eating or drinking; for the least error in that way will often prove fatal by debilitating the body, whose utmost strength in time of full health was perhaps scarce sufficient to resist the pestilential miasmata of the atmosphere.

It appears, therefore, from the concurrent testimony of the most eminent physicians, that the most proper medicine to be used, either as a preventative or cure for remitting and intermitting disorders is the Peruvian bark, administered with proper precautions, and after the *primæ viæ* have been evacuated of the putrid bilious matter collected in them. In those species of *tritæophyæ*, &c. belonging to this class, enumerated by Sauvages, the same remedies only were useful; but in that pestilential distemper which he calls *tritæophyæ Vratilavienfis*, he tells us, that washing the body with water sometimes hot sometimes cold, watery clysters, and plenty of aqueous drink, were likewise of use. This method of treating malignant fevers is but lately come into practice, and shall be more fully considered under the cure of continued fevers.

GENUS II. QUARTANA; the QUARTAN FEVER.  
Quartana auctorum, *Sauv.* Gen. 89. *Lin.* 17.  
*Vog.* 3. *Sag.* 711. *Hoffm.* II. p. 23. *Junc.* tab. 81.

XIV. The Genuine QUARTAN. Sp. I. var. I. A.  
Quartana legitima, *Sauv.* sp. I. *Sydenham* de morb. acut. cap. v.

Description. The genuine quartan, according to Juncker, keeps its form more exactly than other intermittents; scarcely coming on at any other time than four or five in the afternoon. The cold is less violent than in the tertian; but is very perceptible, though it

doth not proceed to such a height as to make the limbs shake; and continues for about two hours. It is preceded and accompanied by a languor both of body and mind. There is seldom any vomiting unless when the stomach is manifestly overloaded with aliment; neither is there any diarrhœa, but the belly in general is rather bound, not only on the days on which the paroxysm takes place, but also on the intermediate ones. The heat which slowly succeeds the cold, is less troublesome to the patient by its violence than by the uneasy dryness of the skin, which is scarce ever moistened with sweat. This heat rarely continues longer than four or six hours, unless perhaps at the first or second paroxysm. It is accompanied also with a giddiness and dull pain of the head. On the termination of the paroxysm, the patient returns to a middling state of health, and continues in the same for the rest of the intermediate days; only there remains somewhat of a loathing, and a deep-seated pain as if the person was all over bruised or broken, which kind of sensation the physicians are wont to call *estheopsys*. The fit returns every fourth day, and that precisely at the same hours, being rarely postponed.

*Causes of, and persons subject to, this disorder.* The same general causes concur in producing this as in other intermittents, namely marsh miasmata, and whatever can dispose the body to be easily affected by them. Studious people, and those of a melancholic turn, are said to be particularly subject to quartans; but what are the immediate causes which produce a return of the fits every fourth day, instead of every day, or every third day, must no doubt lie for ever concealed, as depending upon the secret and inexplicable mechanism of the human body.

*Prognosis.* A simple quartan, where there is no reason to dread any induration of the viscera, may very certainly admit of a cure; and the prognosis can never be unfavourable, unless in cases of extreme weakness, or where the distemper hath been unskillfully treated.

*Cure.* This does not in the least differ from that which hath been fully laid down for the simple tertian, and which it is therefore needless to repeat here.

XV. The Duplicated QUARTAN. Sp. I. var. I. B. 264  
Quartana duplicata, *Sauv.* sp. 4. *Benet.*

This is entirely similar to the duplicated tertian already mentioned; proper allowance being made for the difference between the type of a tertian and quartan.

XVI. The Triplicated QUARTAN. Sp. I. var. I. C. 265  
Quartana triplicata, *Sauv.* sp. 16.

This hath three paroxysms every fourth day, while the intermediate days are entirely free from fever.

XVII. The Double QUARTAN. Sp. I. var. I. D. 266  
Quartana duplex, *Sauv.* sp. 3. *Vog.* sp. 13.

In the double quartan, the fits come on every day except the third; but so that the first paroxysm answers to the third, the second to the fourth, and so on.

XVIII. The Triple QUARTAN. Sp. I. var. I. E. 267  
Quartana triplex, *Sauv.* sp. 5. *Vog.* sp. 14. *Bartholin.* H. anat. c. 1. 95.

This comes on every day, but the quartan type is still preserved by the times of accession; that is, the time of the fourth paroxysm's coming on answers to that of the first, the fifth to the second, the sixth to

PRACTICE the third, &amp;c.

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XIX. The QUARTAN, accompanied with *Symptoms* of other diseases. Sp. I. var. 2.

Quartana cataleptica, *Sauv.* sp. 7. *Bonet.* polyalth. vol. 1. p. 805.

Quartana comatosa, *Sauv.* sp. 15. *Werlhof.* de febr. C. *Pifonis* Observ. de morbis a colluvie serof. obs. 166, 167, 168, 169, 171, 172, 173, 174. Quartana epileptica, *Sauv.* sp. 8. *Scholzii* Conf. 379, 380.

Quartana hysterica, *Sauv.* sp. 10. *Morton.* Pyret. exerc. 1. cap. ix. H. 10, 11.

Quartana nephralgica, *Sauv.* sp. 9.

Quartana metastatica, *Sauv.* sp. 17.

Quartana amens, *Sauv.* sp. 12. *Sydenham* de morb. acut. cap. v.

Quartana splenetica, *Sauv.* sp. 2. *Etmuller.* Coll. consult. cas. 25.

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XX. The QUARTAN complicated with other Diseases. Sp. I. var. 3.

Quartana syphilitica, *Sauv.* sp. 6. *Plateri.* observ. L. III. p. 676. *Edin. Ess.* art. xlviii. obs. 8.

Quartana arthrica, *Sauv.* sp. 11. *Musgr.* de Arthr. sympt. cap. ix. H. 4. et 5.

Arthritis febrisque, *Sauv.* sp. 10.

Arthritis febricosa, *Sauv.* sp. 10. *Werlhof.* de febr. *Cockburn* de morbis navigantium, obs. 19.

Quartana scorbutica, *Sauv.* sp. 14. *Bartbol.* de med. Dan. diff. iv. *Tim.* L. VIII. cas. 18.

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XXI. The Remitting QUARTAN. Sp. II.

Tetartophya, *Sauv.* gen. 85. *Sag.* 699. *Lin.* 21. Quartana remittens auctorum.

Var. 1. Tetartophya simplex, *Sauv.* sp. 1.

2. Amphimerina femiquartana, *Sauv.* sp. 23.

3. Tetartophya semiteriana, *Sauv.* sp. 5.

4. Tetartophya maligna, *Sauv.* sp. 6. *Lautter.* Hist. med. cas. 21. *M. Donat.* L. III. cap. 14. ex *M. Gatenaria* *Horsf.* L. I. obs. 15.

5. Tetartophya carotica, *Sauv.* sp. 4. *Werlhof.* de febr. *Bianchi* Hist. hep. pars III. const. ann. 1718. p. 751.

6. Tetartophya splenalgica, *Sauv.* sp. 2.

7. Tetartophya, hepatalgica, *Sauv.* 3. *Car.* *Pis.* in prefat. p. 33.

8. Amphimerina ipsamodica, *Sauv.* sp. 16.

To the tertian or quartan fevers also belong the *Eraticæ* of authors. As all those abovementioned differ only in the slight circumstance of the type from the intermitting and remitting tertians already described at length, it is unnecessary here to take up time in describing every minute circumstance related by physicians concerning them, especially as it could contribute nothing towards the laying down a better method of cure than what hath been already suggested.

GENUS III. QUOTIDIANA; the QUOTIDIAN FEVER.

Quotidiana auctorum, *Sauv.* gen. 86. *Lin.* 15. *Vog.* I. *Hoffm.* II. 33. *Junc.* tab. 79.

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XXII. The Genuine QUOTIDIAN. Sp. I. var. 1. A. Quotidiana simplex, *Sauv.* sp. 1.

Quotidiana legitima, *Sennert.* de febr. cap. 18.

Description. This kind of fever generally comes on about six or seven o'clock in the morning, beginning

with a considerable degree of cold and shivering, which lasts for about an hour; and is often accompanied with vomiting, or spontaneous diarrhœa, or both. It is succeeded by a pretty strong heat, accompanied with thirst, restlessness, and pain of the head. When the heat abates a little, a spontaneous sweat commonly follows, and the whole paroxysm rarely exceeds six hours. It returns, however, every day almost always at the same hour, unless it is evidently disturbed.

*Causes of, and persons subject to, the disease.* The same general causes are to be assigned for the quotidian as for other intermittents. This kind occurs but rarely: and is said to attack people of a phlegmatic temperament rather than any other; also old people rather than young, and women rather than men.

The prognosis and method of cure are not different from those of tertians and quartans.

XXIII. The Partial QUOTIDIAN. Sp. I. var. 1. B. 272

Quotidiana partialis, *Sauv.* sp. 16. *Cnofsef.* E. N. C. D. I. A. III. obs. 205. *Edin. Med. Ess.* vol. i. art. 31. vol. ii. art. 16.

Quotidiana cephalalgica, *Sauv.* sp. 6. *Mort.* pyretol. exerc. i. hist. 27. *Van Swieten* in *Boerh.* p. 534.

Cephalalgia intermittens, *Sauv.* sp. 7.

Cephalalgia febricosa, *Sauv.* sp. 4.

Quotidiana ophthalmica, *Morton.* ibid. hist. 17. *Van Swieten.* ibid.

Ophthalmia febricosa, *Sauv.* sp. 23.

These distempers attack only some particular part of the body, as the head, the eye, arm, &c. producing periodical affections of those parts returning once in 24 hours; and are to be cured by the bark, as other intermittents. They are known to belong to this class, by the evident intermission of the pain or other affection of the part. The *quotidiana hysterica*, *Sauv.* sp. 3. *quotidiana catarrhalis*, *Sauv.* sp. 9. and *quotidiana stranguriola*, *Sauv.* sp. 11. seem to be symptomatic disorders.

XXIV. The Remitting QUOTIDIAN. Sp. II. 273

Amphimerina, *Sauv.* gen. 84. *Lin.* 20.

Quotidiana continua, *Vog.* 15.

Quotidianæ remittentes et continuæ auctorum.

Amphimerina latica, *Sauv.* sp. 1.

Febris continua lymphatica, *Etmuller.* Coll. conf. cas. 32. *River.* Obs. cent. 1. obs. 57.

Amphimerina singultuosa, *Sauv.* sp. 14.

Febris continua Lyngdøes, *Vog.* 26.

Concerning these also nothing remains necessary to be mentioned in this place, having already so fully discussed the remitting fevers in all the different parts of the world. Many other varieties of these fevers mentioned by different authors are to be accounted merely symptomatic.

SECT. II. CONTINUED FEVERS.

Continuæ, *Sauv.* class. ii. ord. 1. *Vog.* class. I. ord. 2.

*Sag.* 666. *Boerh.* 727.

Continentes, *Lin.* class. ii. ord. 1. *Stahl.* Cas. mag. 35. *Cal.* min. 87. *Junc.* 58. *Sennert.* de febr. L. ii. cap. 2. et 10.

XXV. SYNOCHA. GENUS IV.

Synocha, *Sauv.* gen. 80. *Lin.* 12. *Junc.* 58. 274

Synocha, five febris acuta sanguinea, *Hoffm.* II. 105.

Synochus, *Vog.* 16.

Continua



Continua non putris, Boerh. 729.

Ephemera, Sauv. g. 79. Boerh. 728. Junck. 57.

Diaria, Lin. 11.

Febris inflammatoria auctororum.

*Description.* The most simple kind of synocha is the ephemera or diary fever. It begins without any sensation of cold or shivering, unless there is some internal inflammation, or the small pox or measles happen to be present. A continual heat without any intermission constitutes the essence of this disease. The heat, however, is more tolerable than in the synocha properly so called. In some the pains of the head are pungent and throbbing, answering to the pulsations of the arteries; but in others they are dull and heavy. The face is red and bloated; and there is a remarkable lassitude of the limbs, with a great, full, and frequent pulse. The urine is red, and deposits a sediment almost of the colour of orange-peel; and in the very first day of the disease, signs of concoction, (according to the Hippocratic phrase), appear in it. The fever commonly goes off with a gentle sweat, but more rarely with an hæmorrhage of the nose. Its shortest period is 24 hours; but if it goes beyond the fourth day, it is then a *synocha* properly so called.

The simple synochus, according to Vogel, begins with cold and shivering, succeeded by vehement heat, redness, and dryness of the skin. The face, especially, is very red, and the thirst intense. The head is either pained or heavy. The patient either doth not sleep at all, or is disturbed with dreams. A moist sweat then breaks out all over the skin. The pulse is full, quick, and frequent; the judgment is sometimes a little disturbed: young people are apt to be terrified with imaginations; and they for the most part incline to sleep: the respiration is difficult, and the belly colic; at the same time that a tense kind of lassitude is perceived over the whole body. A complete crisis takes place either on the fourth, or at the farthest on the eleventh day. The characteristic marks of the simple synochus, therefore, are, A redness of the face, moisture of the skin, and great and frequent pulse.

*Causes of, and persons subject to, this disease.* The causes of inflammatory fevers assigned by Dr Cullen have been already largely discussed in the first part of this treatise; and as we have already remarked of intermittents, so must we also now remark of continued fevers, that it is impossible to discover those minute causes which occasion the difference of type betwixt one inflammatory fever and another, though most authors pretend to enumerate these with great certainty. Thus Juncker tells us, that the cause of the simple ephemera is plethora, together with any immoderate agitation and commotion of the fluids while in that state. Vogel reckons among the causes of his *febris diaria*, passions of the mind, pain, want, exposure to the sun, &c.; a repulsion or absorption of certain humours; wounds, fractures, luxations, &c.: so that in general we may reckon every thing tending to increase the action of the arterial system to be in certain circumstances a cause of inflammatory fever. Hence we find those are most subject to the synocha whose constitution is either naturally robust, or who are exposed to those causes which tend to produce an increased action of the arterial system; such as hard labour, high living, &c.

*Pægnosis.* The most simple kind of synocha, that

is, the ephemera or diary fever, is commonly cured without the assistance of medicine; and therefore the prognosis is for the most part favourable; yet, if it is improperly treated by heating medicines, it may easily be converted into the other kind; or, if there is a putrid disposition of the fluids, into a fever of a very dangerous nature. The same thing is to be understood even of the most violent kind; for simple inflammatory fevers are not dangerous unless complicated with an affection of some particular part, as the pleura, stomach, &c.

*Cure.* Here Dr Cullen objects to the hypothesis of those who are for leaving the cure of continued fevers to the operations of nature; because these operations are neither certain in themselves, nor are they so well understood as to enable us to regulate them properly; and it is likewise possible to supersede them by art. The plan therefore on which he proceeds is, to form his indications of cure upon the means of obviating the tendency to death in fevers; and these he reduces to three. 1. To moderate the violence of re-action. 2. To remove or obviate the causes of debility; and, 3. To obviate or correct the tendency of the fluids to putrefaction.

The *first* indication may be answered, 1. By all those means which diminish the action of the heart and arteries. 2. By those which take off the spasm of the extreme vessels, which, according to his theory, is the chief cause of violent re-action.

1. The action of the heart and arteries may be diminished, 1. By avoiding or moderating those irritations which, in one degree or other, are almost constantly applied to the body. 2. By the use of certain sedative powers. 3. By diminishing the tension and tone of the arterial system.

[1.] The irritations above-mentioned are the impressions made upon our senses, the exercise of the body and mind, and the taking in of aliments. The avoiding of these as much as possible, or the moderating their force, makes what is properly called the *antiphlogistic regimen*, proper to be employed in *almost every* continued fever. This regimen is to be directed in the following manner.

1. Impressions on the external senses, as stimulant to the system, and a chief support of its activity, should be avoided as much as possible; especially such as are of a stronger kind, and which give pain and uneasiness. No impression is to be more carefully guarded against than that of external heat; and at the same time every other means of increasing the heat of the body is to be shunned. Both these precautions are to be avoided as soon as a hot stage is fully formed, and to be attended to during its continuance, except in certain cases, where a determination to sweating is necessary, or where the stimulant effects of heat may be compensated by circumstances which determine it to produce a relaxation and revulsion.

2. All motion of the body is to be avoided as much as possible, and that posture only chosen which employs the fewest muscles, and keeps none of them long in a state of contraction. Speaking, as it accelerates respiration, is particularly to be avoided. It must also be observed, that every motion of the body is more stimulant in proportion as the patient is weaker.

3. The exercise of the mind is also to be avoided as being a stimulus to the body; but here an exception

is to be made in the case of a delirium coming on, when the presenting of accustomed objects may divert the irregular train of ideas then arising in the mind.

4. The presence of recent aliment in the stomach proves always a stimulus to the system, and ought therefore to be as moderate as possible. A total abstinence for some time may be of service; but as this cannot be long continued with safety, we must avoid the stimulus of aliment by choosing that kind which gives the least. Alimentary matters are also to be accounted more stimulant in proportion to their alkaliescent qualities; and this leads us to avoid all animal, and use only vegetable food. For the same reason, aromatic and spirituous liquors are to be avoided; and in answering the present indication, we must abstain from all fermented liquors except those of the lowest quality. Other stimuli are, the sensation of thirst, crudities or corrupted humours in the stomach, a preternatural retention of the feces in the intestines, and a general acrimony of all the humours, which is in most fevers to be suspected. These are to be removed by such methods as the urgency of the symptoms require, by diluting liquors, vomiting, the use of acids, laxative clysters, and large quantities of antiseptic drinks.

[2.] The second method of moderating the violence of re-action is by the employment of certain sedative powers with a view to diminish the activity of the whole body, and particularly that of the sanguiferous system. The first of these to be mentioned is the application of cold. Heat is the chief support of the activity of the animal-system; and the system is therefore provided with a power of generating heat in itself: but at the same time we observe, that this would go to excess, were it not constantly moderated by a cooler temperature in the surrounding atmosphere. When, therefore, the generating power of heat in the system is increased, as is commonly the case in fevers, it is necessary not only to avoid all further means of increasing it, but also to apply air of a cooler temperature; or at least to apply it more entirely and freely than in a state of health. This is shown, from some late observations, to be a very powerful means of moderating the violence of re-action; but what is the mode of its operation, to what circumstances of fever it particularly applies, or what limitations it requires, are not yet well ascertained.

Another sedative power very frequently employed in fevers, is that of certain medicines known in the *materia medica* by the name of *refrigerants*. The chief of these are acids of all kinds when sufficiently diluted, and which are, in several respects, remedies adapted to continued fevers. Those especially in use are the vitriolic and vegetable; and on many accounts the latter are to be preferred. Another set of refrigerants are the neutral salts formed of the vitriolic, nitrous, or vegetable acids, with alkalies either fixed or volatile. All these neutrals, while they are dissolved in water, generate cold; but as that cold ceases soon after the dissolution is finished, and as the salts are generally exhibited in a dissolved state, their refrigerant power in the animal-body does not at all depend upon their power of generating cold with water. Nitre is the refrigerant chiefly employed; but all the others, compounded as above-mentioned, partake more or less of the same quality. Besides these neutrals, some me-

tallic salts have also been employed in fevers, particularly the sugar of lead: but the refrigerant powers of this salt are by no means well ascertained, and its deleterious qualities are too well known to admit of its being freely used.

[3.] The third general method of diminishing the re-action of the system, is by lessening the tension, tone, and activity of the sanguiferous system. As the activity of the system in a great measure depends upon the tone, and this again upon the tension, of the vessels, given to them by the quantity of fluids they contain, it is evident, that the diminution of the quantity of these must diminish the activity of the sanguiferous system. The most efficacious means of diminishing the quantity of fluids is by the evacuations of blood-letting and purging. The former is evidently one of the most powerful means of diminishing the activity of the whole body, and especially of the sanguiferous system; and it must therefore be the most effectual means of moderating the re-action in fevers. When the violence of re-action, and its constant attendant a phlogistic diathesis, are sufficiently evident; when these constitute the principal part of the disease, and may be expected to continue through the whole of it, as in the cases of synocha; then blood-letting is the principal remedy, and may be employed as far as the symptoms of the disease may seem to require, and the constitution of the patient will bear. It must, however, be attended to, that a greater evacuation than is necessary may occasion a slower recovery, and render the person more liable to a relapse, or bring on other diseases. It is also to be observed, that this evacuation is the more effectual as the blood is more suddenly drawn off, and as the body is at the same time more free from all irritation; and, therefore, when it is in a posture in which the fewest muscles are in action.

With regard to purging, when we consider the quantity of fluids constantly present in the cavity of the intestines, and the quantity which may be drawn off from the innumerable excretories that open into this cavity, it will be obvious, that a very great evacuation may be made by purging: and if this be done by a stimulus that is not at the same time communicated to the rest of the body, it may, by emptying both the cavity of the intestines and the arteries which furnish the excretions poured into it, induce a considerable relaxation in the whole system; and is therefore suited to moderate the violence of re-action in fevers. But it is to be observed, that as the fluid drawn from the excretories opening into the intestines is not all drawn immediately from the arteries, and as what is even more immediately drawn from these is drawn off slowly; so the evacuation will not, in proportion to its quantity, occasion such a sudden depletion of the red vessels as blood-letting does; and therefore cannot act so powerfully in taking off the phlogistic diathesis of the system.

At the same time, the evacuation may induce a considerable degree of debility; and therefore, in those cases in which a dangerous state of debility is likely to occur, purging is to be employed with a great deal of caution; and this caution is more difficult to be observed than in the case of blood-letting: and it is further to be noticed, that as purging takes off in some measure the determination of the blood to the vessels

on the surface of the body, it seems to be an evacuation not well adapted to the cure of fevers.

II. The other method of moderating the violence of re-action in fevers is by the exhibition of those remedies suited to take off the spasm of the extreme vessels, supposed to be the irritation which chiefly supports the re-action. The means to be employed for this purpose are either internal or external.

*Fifth*, The internal means are, 1. Those which determine the force of the circulation to the extreme vessels on the surface of the body, and, by restoring the tone and activity of these vessels, overcome the spasm on their extremities. 2. Those medicines which have the power of taking off spasm in any part of the system, and which are known under the title of ANTISPASMODICS.

(1.) Those remedies which are fit to determine to the surface of the body are, 1. Diluents. 2. Neutral salts. 3. Sudorifics. 4. Emetics.

1. Water enters, in a large proportion, into the composition of all the animal-fluids, and a large quantity of it is always diffused through the whole of the common mass. In a sound state, the fluidity of the whole mass depends upon the quantity of water present in it. Water therefore is the proper diluent of our mass of blood, and other fluids are diluent only in proportion to the quantity of water they contain.

In a healthy state also, the fullness of the extreme vessels and the quantity of excretion are in proportion to the quantity of water present in the body. But in fever, though the excretions are in some measure interrupted, they continue in such quantity as to exhale the more fluid parts of the blood; and, while a portion of them is at the same time necessarily retained in the larger vessels, the smaller and the extreme vessels, both from the deficiency of fluid and their own contracted state, are less filled, and therefore allowed to remain in that condition. To remedy this contracted state, nothing is more necessary than a large supply of water or watery fluids taken in by drinking or otherwise; for as any superfluous quantity of water is forced off by the several excretories, such a force applied may be a means of dilating the extreme vessels, and of overcoming the spasm affecting their extremities. Accordingly, the throwing in of a large quantity of watery fluids has been, at all times, a remedy much employed in fevers; and in no instance more remarkably than by the Spanish and Italian physicians, in the use of what they call the *dieta aqua*. This practice consists in taking away every other kind of aliment and drink, and in giving, in divided portions, every day for several days together, six or eight pounds of plain water, generally cold, but sometimes warm. All this, however, is to be done only after the disease has continued for some time, and at least for a week.

2. A second means of determining to the surface of the body, is by the use of neutral salts. These neutrals, in a certain dose, taken into the stomach, produce soon after a sense of heat upon the surface of the body; and, if the body be covered close and kept warm, a sweat is readily brought out. The same medicines taken during the cold stage of a fever, very often put an end to it, and bring on the hot one; and they are also remarkable for stopping the vomiting which so frequently attends the cold stage of fevers. All this shows, that neutral salts have a power of determining the

blood to the surface of the body, and may therefore be of use in taking off the spasm which subsists there in fevers. The neutral most commonly employed in fevers, is that formed of an alkali with the native acid of vegetables. But all the other neutrals have more or less of the same virtue; and perhaps some of them, particularly the ammoniacal salts, possess it in a stronger degree. As cold water taken into the stomach often shews the same diaphoretic effects with the neutral salts, it is probable that the effect of the latter depends upon their refrigerant powers above-mentioned.

3. A third method of determining to the surface of the body, and taking off the spasm subsisting there, is by the use of sudorifics and of sweating. The propriety of this remedy hath been much disputed; and many specious arguments may be adduced both for and against the practice. In its favour may be urged, 1. That in healthy persons, in every case of increased action of the heart and arteries, a sweating takes place, and is, seemingly, the means of preventing the bad effects of such increased action. 2. That, in fevers, their most usual solution and termination is by spontaneous sweating. 3. That, even when excited by art, it has been found useful at certain periods, and in certain species of fever.—On the other hand, it may be urged against the practice of sweating, 1. That in fevers, as a spontaneous sweating does not immediately come on, there are some circumstances different from those in the state of health, and which may render it doubtful whether the sweating can be safely excited by art. 2. That in many cases the practice hath been attended with bad consequences. The means commonly employed have a tendency to produce an inflammatory diathesis; which, if not taken off by the sweat succeeding, must be increased with much danger. Thus sweating employed to prevent the accessions of intermitting fevers has often changed them into a continued form, which is always dangerous. 3. The utility of the practice is doubtful, as sweating, when it happens, does not always give a final determination, as must be manifest in the case of intermittents, and in many continued fevers which are sometimes in the beginning attended with sweatings which do not prove final; and, on the contrary, whether they be spontaneous or excited by art, seem often to aggravate the disease.

From these considerations, it is doubtful if the practice of sweating can be admitted very generally; but, at the same time, it is also very doubtful if the failure of the practice, or the mischiefs said to arise from it, have not been owing to the improper conduct of the practitioner. With respect to the last, it is almost agreed among physicians, 1. That sweating has been generally hurtful when excited by stimulant, heating, and inflammatory medicines. 2. That it has been hurtful when excited by much external heat, and continued with a great increase of the heat of the body. 3. That it is always hurtful when it does not relieve; and rather increases the frequency and hardness of the pulse, the anxiety and difficulty of breathing, the headache, and delirium. 4. That it is always hurtful if it is urged when the sweat is not fluid, and when it is partial and on the superior parts of the body only.

In these cases, it is probable, that either an inflammatory diathesis is produced, which increases the spasm on the extreme vessels; or that, from other causes, the spasm



spasm is too much fixed to yield easily to the increased action of the heart and arteries; and upon either supposition it must be obvious, that urging the sweat may produce determinations to some of the internal parts, with very great danger.

Notwithstanding these doubts, however, it still remains true, 1. That sweating has certainly been often useful in preventing the accessions of fevers when they have been certainly foreseen, and a proper conduct employed. 2. That even after fevers have in some measure come on, sweating has interrupted their progress when properly employed, either at the very beginning of the disease, or during its approach and gradual formation. 3. That even after pyrexia have continued for some time, sweating has been successfully employed in curing them, as particularly in the case of a rheumatism. 4. That certain fevers produced by a very powerful sedative contagion, have been generally treated most successfully by sweating.

These instances are in favour of sweating, but give no general rule; and it must be left to farther experience to determine how far any general rule can be established in this matter. In the mean time, if the practice of sweating is to be attempted, the following rules may be laid down for the conduct of it. 1. That a sweat should be exhibited without the use of stimulant inflammatory medicines. 2. That it should be excited with as little external heat, and with as little increase of the heat of the body, as possible. 3. That, when excited, it should be continued for a due length of time; not less than 12 hours, and sometimes for 24 or 48 hours; always, however, supposing that it proceeds without the dangerous circumstances already mentioned. 4. That for some part of the time, and as long as the person can easily bear, it should be carried on without admitting of sleep. 5. That it should be rendered universal over the whole body; and therefore particularly that care be taken to bring the sweating to the lower extremities. 6. That the practice should be rendered safer by moderate purging excited at the same time. 7. That it should not be suddenly checked by cold any how applied to the body.

When attention is to be given to these rules, the sweating may be excited, 1. By warm bathing, or a fomentation of the lower extremities. 2. By frequent draughts of tepid liquors, chiefly water, rendered more grateful by the addition of a light aromatic, or more powerful by that of a small quantity of wine. 3. By giving some doses of neutral salts. 4. Most effectually, and perhaps most safely, by a large dose of an opiate, joined with a portion of neutral salts, and of an emetic.

The fourth mean of determining to the surface of the body, and thereby taking off the spasm affecting the extreme vessels, is by the use of emetics. These, particularly of the antimonial kind, have been employed in the cure of fevers ever since the introduction of chemical medicines; and though of late their use has become very general, their efficacy is still disputed, and their manner of operating is not commonly explained.

Vomiting is in many respects useful in fevers; as it evacuates the contents of the stomach, as it emulges the biliary and pancreatic ducts, and evacuates the contents of the duodenum; and perhaps also of a larger portion of the intestines; as it agitates the whole of the abdominal viscera, it expeds the circulation in them, and

promotes their several secretions; and lastly, as it agitates also the viscera of the thorax, it has like effects there.

It is not to this cause, however, that we are to impute the effect vomiting has in determining to the surface of the body. This must be attributed to the particular operation of emetics upon the muscular fibres of the stomach, whereby they excite the action of the extreme arteries on the surface of the body, and thereby effectually determine the blood to these vessels, remove the atony, and take off the spasm affecting them. For this purpose they are exhibited in two different ways; that is, either in such doses as may excite full and repeated vomitings, or in such doses as may excite sickness and nausea only, with little or no vomiting at all.

Full vomiting is well suited to determine to the surface of the body, and thereby to obviate the atony and spasm which lay the foundation of fever. Thus, vomiting excited a little before the expected accession of the paroxysm of an intermittent, has been found to prevent the paroxysm altogether. It has been observed also, that when contagion has been applied to a person, and first discovers its operation, a vomit given will prevent the fever which otherwise was to have been expected.

These are the advantages to be obtained by exciting vomiting at the first approach of fevers, or of the paroxysm of fevers; and they may also be applied after fevers are formed, to take off, perhaps entirely, the atony and spasm, or at least to moderate these, so that the fever may proceed more gently and safely. It is seldom, however, that vomiting is found to produce a final solution of fevers; and after they are once formed, it is commonly necessary to repeat the vomiting several times; but this is attended with inconvenience, and sometimes with disadvantage. The operation of full vomiting is transitory, and the exercise of vomiting is a debilitating power; and therefore, when the vomiting does not remove the atony and spasm very entirely, it may give occasion to their recurrence with greater force. For these reasons, after fevers are fully formed, physicians have thought proper to employ emetics in nauseating doses only. These are capable of exciting the action of the extreme vessels, and their operation is more permanent. At the same time they often show their power by exciting some degree of sweat, and their operation is rendered more safe by their commonly producing some evacuation by stool.

The emetics chiefly in use at present are, ipecacuanha and antimony. The former may be employed for determining to the surface of the body; but, even in very small doses, it so readily excites vomiting, that it is with difficulty employed for the purpose of nauseating only; and in whatever manner employed, there is reason to suspect that its effects are less permanent, and less powerfully communicated from the stomach to the rest of the system, than those of antimony. This last is therefore generally preferred; and its preparations, seemingly various, may all be reduced to two heads; one comprehending those in which the reguline part is in a condition to be acted upon by acids, and therefore on meeting with acids in the stomach it becomes active; and another, comprehending those preparations in which the reguline part is already joined with an acid, rendering it active. Of each kind there

PRACTICE are great numbers, but not differing essentially from one another; the two most worthy of notice are, the *calx nitrata antimoni* and *emetic tartar* of the Edinburgh dispensatory. Both these are very efficacious medicines; but the latter seems preferable, because its dose is capable of being better ascertained; though the former, on account of its slower operation may have some advantages, and in certain cases be more efficacious as a purgative and sudorific.

The time most proper for exhibiting these medicines is a little before the accession, when that can be certainly known. In continued fevers the exacerbations are not always very observable; but there is reason to believe, that one commonly happens about noon or soon after it; and that these, therefore, are the most proper times for exhibiting emetics.

With respect to the manner of administration, that of the *calx nitrata* is simple, as the whole of what is thought a proper dose may be given at once; and no more can be properly given till the next accession. The administration of the emetic tartar is different. It is to be given in small doses, not sufficient to excite vomiting; and these doses are to be repeated, after short intervals, for several times, till sickness, nausea, and some, though not much, vomiting come on. The difference of administration must depend upon the dose, and the length of the interval at which it is given. If it is intended that the medicine should certainly operate by stool, the doses are made small, and the intervals long. On the contrary, when vomiting is proper, or when much purging ought to be avoided, and therefore some vomiting must be admitted, the doses are made larger, and the intervals shorter. With respect to both kinds of preparations, the repetition is to be made at the times of accession, but not very often: for if the first exhibitions, duly managed, have little effect, it is seldom that the after exhibitions have much; and it sometimes happens that the repeated vomiting, and especially repeated purging, does harm by weakening the patient.

(2.) The other set of internal medicines which are supposed useful in taking off the spasm of the extreme vessels, are those named *antispasmodic*. But whatever may be the virtues of some of them in this way, such is their power of stimulating at the same time, that very few of them can with safety be administered in fevers of an inflammatory nature. Almost the only one which can with safety be exhibited in these cases is camphire; and the operations of this are by no means well ascertained. Dr Huxham mentions it as a corrector of the acrimony of cantharides; and assures us, that it very effectually promotes a diaphoresis. But from the remarks of other practitioners, we have no just reason to suppose that it acts perceptibly in a dose of five or six grains, though in 15 or 20 it produces a particular kind of intoxication.

Secondly, The external means suited to take off the spasm of the extreme vessels, are blistering and warm bathing.

1. What are the effects of blistering so frequently employed in fevers, is not yet agreed upon among physicians. Dr Cullen is of opinion, that the small quantity of cantharides absorbed from a blistering plaster, is not sufficient to change the confidence of the mass of blood; and therefore, that such a quantity can nei-

ther do good by resolving phlogistic lentor if it exists, nor do harm by increasing the dissolution of the blood arising from a putrid tendency in it. The effects of cantharides upon the fluids, therefore, may be entirely neglected. The inflammation produced by the application of cantharides to the skin, affords a certain proof of their stimulant power: but in many persons the effect of that stimulus is not considerable; in many it is not communicated to the whole system; and even when it does take place in the whole system, it seems to be taken off very entirely by the effusion and evacuation of serum from the blistered part. It may be concluded, therefore, that neither much good is to be expected, nor much harm to be apprehended, from the stimulant power of blistering; and the certainty of this conclusion is established by the great benefit arising from the proper practice of blistering in inflammatory diseases. Much has been imputed to the evacuation made by blistering; but it is never so considerable as to affect the whole system; and therefore can neither by a sudden depletion relax the sanguiferous system, nor by any revulsion affect the general distribution of the fluids. The evacuation, however, is so considerable as to affect the neighbouring vessels; and the manifest utility of blistering near the part affected in inflammatory diseases leads us to think, that blistering, by deriving to the skin, and producing an effusion there, relaxes the spasm of the deeper seated vessels. It is in this manner, most probably, that the tumour of a joint, from an effusion into the cellular texture under the skin, takes off the rheumatic pain formerly affecting that joint. Analogous to this, probably, is the good effect of blistering in continued fevers; and arises from the relaxation of the spasm of the extreme vessels by a communication of the blistered part with the rest of the skin. A blister may be employed at any period in continued fevers; but it will be of most advantage in the advanced state of such fevers, when, the reaction being weaker, all ambiguity from the stimulating power of blistering is removed, and when it may best concur with other circumstances tending to a final solution of the spasm.

From this view of the matter it will appear, that the part of the body to which blisters ought to be applied is indifferent, except upon the suspicion of topical affection, when the blistering is to be made as near as possible to the part affected. Whether sinapisms and other *rufefaciencia* act in a manner analogous to what we have supposed of blistering, may be doubtful; but their effects in rheumatism and other inflammatory diseases render it probable.

2. The other external means of taking off the spasm of the extreme vessels is warm bathing. This was frequently, and in different circumstances, employed by the ancients; but has, till very lately, been neglected by modern physicians. As the heat of the bath stimulates the extreme vessels, and, with the concurrence of moisture, also relaxes them, it seems to be a safe stimulus, and well suited to take off the spasm affecting these vessels. It may be applied to the whole body by immersion: but this is in many respects inconvenient; and whether some of the inconveniences of immersion might not be avoided by a vapour-bath, we have not yet learned by experience; but we know from much experience, that most of the purposes of warm bathing can be obtained by a fomentation

**PRACTICE** mentation of the legs and feet, if properly administered, and continued for a due length of time, not less than an hour. The marks of the good effects of such a fomentation are, the patient's bearing it easily, its relieving delirium, and inducing sleep.

Thus doth the learned professor lay down the cure of inflammatory fevers in so full a manner, that nothing further seems necessary to be added on the subject. His other two indications, namely, removing the debility, and correcting the putrescent disposition of the fluids, shall be taken notice of under the following genus.

#### GENUS V. TYPHUS; the Typhus Fever.

Typhus, *Sauv.* Gen. 82. *Sag.* 677.

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XXVI. The *Slow Nervous Fever*. Sp. I. var. 1. Febris maligna hectica convulsiva, five lues *venus*, *Willis*, de morb. convulsiv. cap. 8.

Febris pestilens, *Fracastor.* de morb. contag. L. II. cap. 4.

Febris pestilens sine caractere veneni, *Foresti*, L. VI. obs. 26.

Febris hectica pestilens, *Foresti*, L. VI. obs. 32.

Febris nova ann. 1685, *Sydenham*, Sched. monitor.

Febris putrida nervosa, *Wintringh.* Com. Nosolog. ad ann. 1720, 1721.

Febris lenta nervosa, *Huxham* on fevers, chap. 8.

Febris contagiosa, *Lind* on fevers and infection, *passim*.

Typhus nervosus, *Sauv.* sp. 2.

Typhus comatosus, *Sauv.* sp. 3.

Tritæophya typhodes *Mangeti*, *Sauv.* sp. 11. *Rayn.* Fort. de febribus.

*Description.* Of all the descriptions we have of the nervous fever, that of Dr Huxham is the best. According to him, the patient at first grows somewhat listless, and feels slight chills and shudders, with uncertain flushes of heat, and a kind of weariness all over, like what is felt after great fatigue. This is always attended with a sort of heaviness and dejection of spirit, and more or less of a load, pain, or giddiness of the head; a nausea and distrelish of every thing soon follows, without any considerable thirst, but frequently with urging to vomit, though little but insipid phlegm is brought up. Though a kind of lucid interval of several hours sometimes intervenes, yet the symptoms return with aggravation, especially towards night; the head grows more giddy or heavy; the heats greater; the pulse quicker, but weak; with an oppressive kind of breathing. A great torpor, or obtuse pain and coldness, affects the hinder-part of the head frequently, and oftentimes a heavy pain is felt on the top all along the *coronary suture*; this, and that of the back-part of the head, generally attend nervous fevers, and are commonly succeeded by some degree of a delirium. In this condition the patient often continues for five or six days, with a heavy, pale, sunk countenance; seemingly not very sick, and yet far from being well; restless, anxious, and commonly quite void of sleep, though sometimes very drowsy and heavy; but although he appears to those about him actually to sleep, he is utterly insensible of it, and denies that he doth so. The pulse during all this time is quick, weak, and unequal; sometimes fluttering, and sometimes for a few moments slow; nay, even

intermitting, and then, with a sudden flush in the face, immediately very quick, and perhaps soon after surprisingly calm and equal; and thus alternately. The heats and chills are as uncertain and unequal; sometimes a sudden colour and glow arise in the cheeks, while the tip of the nose and ears is cold, and the forehead at the same time in a cold dewy sweat. Nay, it is very common, that a high colour and heat appear in the face, when the extremities are quite cold. The urine is commonly pale, and often limpid; frequently of a whey colour, or like vapid small-beer, in which there is either no manner of sediment, or a kind of loose matter like bran irregularly scattered up and down in it. The tongue at the beginning is seldom or never dry or discoloured, but sometimes covered with a thin whitish mucus: at length, indeed, it often appears very dry, red, and chapped, or of the colour of pomegranate-rind; but this mostly at the *state* or close of the disease: yet, however dry the tongue and lips seem, the patient scarce ever complains of thirst, though sometimes of a heat in the tongue. About the seventh or eighth day, the giddiness, pain, or heaviness of the head become much greater, with a constant noise in it, or *tinnitus aurium*; which is very disturbing to the sick, and frequently brings on a delirium. The load on the præcordia, anxiety and faintness, grow much more urgent; and they often fall into an actual deliquium, especially if they attempt to sit up; coldish sweats suddenly come out on the forehead, and on the backs of the hands, (though at the same time there is too much heat in the cheeks and palms,) and as suddenly go off. If the urine now grows more pale and limpid, a delirium is certainly to be expected, with universal tremors and *subfusultus tendinum*; the delirium is seldom violent, but as it were a confusion of thought and action, muttering continually to themselves, and faltering in their speech. Sometimes they awake only in a hurry and confusion, and presently recollect themselves, but forthwith fall into a muttering dozy state again. The tongue grows often very dry at the *state*, especially in its middle-part, with a yellowish list on each side, and trembles greatly when the sick attempts to put it out. Frequently profuse sweats pour forth all at once about the ninth, tenth, or twelfth day, commonly coldish and clammy on the extremities; oftentimes very thin stools are discharged; and then nature sinks apace; the extremities grow cold, the nails pale or livid; the pulse may be said to tremble and flutter, rather than to beat, the vibrations being so exceeding weak and quick that they can scarce be distinguished; though sometimes they creep on surprisingly slow, and very frequently intermit. The sick become quite insensible and stupid, scarce affected with the loudest noise or the strongest light; though, at the beginning, strangely susceptible of the impressions of either. The delirium now ends in a profound coma, and that soon in eternal sleep. The stools, urine, and tears, run off involuntarily, and denounce a speedy dissolution, as the vast tremblings and twichings of the nerves and tendons are preludes to a general convulsion, which at once snaps off the thread of life. In one or other of these ways are the sick carried off, after having languished for fourteen, eighteen, or twenty days; nay, sometimes much longer. All persons grow deaf and stupid towards the end of

this



this disease (some extremely deaf), though too quick and apprehensive at the beginning; inasmuch that the least noise or light greatly offended them. Many from their immoderate fears seem to hurry themselves out of life, where little danger is apparent at the beginning: nay, some will not allow themselves to sleep, from a vain fear of dozing quite away; and others from the vast hurry, anxiety and confusion they are sensible of in it, or at their awaking.

*Causes of, and persons subject to, the disorder.* The nervous fever is a consequence of contagion received by means of some corrupted animal-substance. It most commonly attacks persons of weak nerves, a lax habit of body, and a poor thin blood; those who have suffered great evacuations, a long dejection of spirits, immoderate watchings, studies, fatigue, &c.; also those who have used much crude unwholesome food, vapid impure drinks, or who have been confined long in damp foul air; who have broken the vigour of their constitutions by salivations, too frequent purging, immoderate venery, &c. Hence we see that the disease consists principally in an extreme debility of the nervous system; for, when people are prepared for this fever by having their nerves already weakened, the contagious particles immediately attack the nervous system, without so much affecting the state of the blood or juices, though the latter are greatly affected in the putrid malignant fevers.

*Prognosis.* In nervous fevers, the prognosis is very much the same with that of the putrid malignant kind. See below.

*Cure.* As this fever is produced by a contagion affecting the nervous system of a person already debilitated, and thus producing weakness in an extreme degree, we have now occasion to consider Dr Cullen's two indications of cure omitted under the *Synocha*; namely, to remove the cause and obviate the effects of debility, and to correct the putrescent tendency of the fluids; for though, in the beginning of nervous fevers, the tendency to putrefaction is not remarkable, it becomes exceedingly great towards their conclusion.

[1.] In answering the first indication, Dr Cullen observes, that most of the sedative powers inducing debility cease to act soon after they have been first applied; and therefore the removing them is not an object of the present indication. There is only one which may be supposed to continue to act for a long time, and that is the contagion applied; but we know nothing in the nature of contagion that can lead us to any measures for removing or correcting it. We know only its effects as a sedative power inducing debility, or as a ferment inducing a tendency to putrefaction in the fluids, the former of which at present falls under our consideration.—The debility induced in fevers by contagion, or other causes, appears, especially in the weaker energy of the brain; but in what this consists, or how it may be restored, we do not well know; but as nature, seemingly for this purpose, excites the motion of the heart and arteries, we must ascribe the continuance of the debility to the weaker re-action of the sanguiferous system: the means, therefore, which we employ for obviating debility, are immediately directed to support and increase the action of the heart and arteries; and the re-

medies employed are tonics or stimulants.

In contagious diseases we know, both from the effects which appear, and from dissections, that the tone of the heart and arteries is considerably diminished; and that tonic remedies are therefore properly indicated. We are to consider these remedies as of two kinds; 1. The power of cold; 2. That of tonic medicines.

The power of cold as a tonic in fevers may be employed in two ways; either as thrown into the stomach, or as applied to the surface of the body. As we have already observed that the power of cold may be communicated from any one part to every other part of the system, so it will be readily allowed that the stomach is a part as fit as any other for this communication, and that cold drink taken into the stomach may prove an useful tonic in fevers.—This the experience of all ages has confirmed; but at the same time it has been frequently observed, that, in certain circumstances, cold drink taken into the stomach has proved very hurtful; and therefore that its use in fevers requires some limitations. What these limitations should be, and what are all the circumstances which may forbid the use of cold drink, it is difficult to determine; but it seems clearly forbidden in all cases where a phlogistic diathesis prevails in the system, and more especially when there are topical affections of an inflammatory nature.

The other method of employing cold as a tonic, is by applying it to the surface of the body, as a refrigerant power fit to moderate the violence of reaction; but probably it may here also be considered properly as a tonic, and useful in cases of debility.—Not only cool air, but cold water also, may be applied to the surface of the body as a tonic. The ancients frequently applied it with advantage to particular parts as a tonic; but it is a discovery of modern times, that, in the case of putrid fevers attended with much debility, the body may be washed all over with cold water. This was first practised at Breslaw in Silesia, as appears from a dissertation under the title of *Epidemia Verna, quæ Wratislaviæ anno 1737 affixit*, to be found in the *Acta Nat. Curios.* vol. x. And from other writers it appears, that the practice has passed into some of the neighbouring countries; but in this island it doth not appear that we have yet had any experience of it.

The medicines which have been employed in fevers as tonics are various. If the *saccharum saturni* hath been found useful, it is probably as a tonic rather than as a refrigerant; and the *enz veneris*, or other preparations of iron which have been employed, can act as tonics only. The preparations of copper, from their effects in epilepsy, are presumed to possess a tonic power; but whether their use in fevers be founded on their tonic or emetic powers, is uncertain. And upon the whole there may no doubt occur some instances of fevers being cured by tonics taken from the fossil kingdom; but the vegetable tonics are the most efficacious, and among these the Peruvian bark certainly holds the first place.

The bark has commonly been considered as a specific, or a remedy of which the operation was not understood. We must observe, however, that, as in many cases the effects of the bark are perceived soon

after its being taken into the stomach, and before it can possibly be conveyed to the mass of blood, we may conclude, that its effects do not arise from its operating on the fluids; and must therefore depend upon its operating on the nerves of the stomach, and being thereby communicated to the rest of the nervous system. This operation seems to be a tonic power, the bark being a remedy in many cases of debility, particularly in gangrene: and if its operation may be explained from its possessing a tonic power, we may easily perceive why it is improper when a phlogistic diathesis prevails; and from the same view we can ascertain in what cases of continued fever it may be admitted. These cases are either where considerable remissions have appeared, when it may be employed to prevent the return of exacerbations, on the same footing as it is used in intermitting fevers; or in the advanced state of fevers, when all suspicion of an inflammatory state is removed, and a general debility prevails in the system; and its being then employed is sufficiently agreeable to the present practice.

Another set of medicines to be employed for obviating debility and its effects, are the direct stimulants. These, in some measure, increase the tone of the moving fibres; but are different from the tonics, as they more directly excite and increase the action of the heart and arteries. This mode of their operation renders their use ambiguous; and when an inflammatory diathesis is present, the effects of these stimulants may be very hurtful; but it still remains probable, that in the advanced state of these fevers, when debility prevails, they may be useful.

Of all the stimulants which may be properly employed, wine seems to be the most eligible. It has the advantage of being grateful to the palate and stomach, and of having its stimulant parts so much diluted, that it can be conveniently given in small doses; and therefore it may be employed with sufficient caution; but it is of little service unless taken pretty largely.—It may be suspected that wine has an operation analogous to that of opium; and on good grounds. But we can distinctly remark its stimulant power only; which renders its effects in the phrenetic delirium manifestly hurtful; and in the mild delirium depending on debility, as remarkably useful.

[2.] We must now proceed to the other indication of cure, namely, to correct or obviate the tendency in the fluids to putrefaction. This may be done, 1. By avoiding any new application of putrid or putrescent matter. 2. By evacuating the putrid or putrescent matter already present in the body. 3. By correcting the putrid or putrescent matter remaining in the body by diluents and antiseptics. 4. By supporting the tone of the vessels, and thereby resisting further putrefaction, or obviating its effects. 5. By moderating the violence of re-action, considered as a means of increasing putrefaction.

The further application of putrid or putrescent matter may be avoided, 1. By removing the patient from places filled with corrupted air. By preventing the accumulation of the patient's own effluvia, by a constant ventilation, and by a frequent change of bed-clothes and body-linen. 3. By the careful and speedy removal of all excremental matters from the patient's chamber. 4. By avoiding animal-food.

The putrid or putrescent matter already present in the body, may be evacuated partly by frequent evacuations of the contents of the intestines; and more effectually still by supporting the excretions of perspiration and urine by the plentiful use of diluents. That which remains in the body may be rendered more mild and innocent by the use of diluents, or may be corrected by the use of antiseptics. These last are of many and various kinds; but which of them are conveniently applicable, or more particularly suited to the case of fevers, is not well ascertained. Those most certainly applicable and useful are acetic acid, acids of all kinds, and neutral salts.

The progress of putrefaction may be considerably retarded, and its effects obviated, by supporting the tone of the vessels; and this may be done by tonic medicines, of which the chief are Cold, and the Peruvian bark, as already mentioned. The violence of re-action increasing the tendency to putrefaction, may be moderated by the means already mentioned under *synocha*.

These are the proper indications to be observed in the cure of the slow nervous fever. Dr Huxham observes, that evacuations (especially bleeding) are improper at the beginning. Even a common purge given at this time hath been followed by surprising languors, syncope, and a train of other ill symptoms. However, it may sometimes be necessary to cleanse the stomach and primæ viæ by a gentle emetic, or a little rhubarb, manna, &c. Indeed, where nausea, sickness, and load at stomach, are urgent, as is frequently the case in the beginning of this fever, a vomit is necessary. Clysters of milk, sugar, and salt, may be injected with safety and advantage every second or third day, if nature wants to be prompted to stool.—The temperate, cordial, diaphoretic medicines are certainly, according to our author, most proper in these fevers; and a well-regulated, supporting, diluting diet is necessary. The latter of itself, judiciously managed, will go a great way in the cure, especially assisted by well-timed and well-applied blisters, and a due care to keep the patient as quiet as possible both in body and mind. But it should be noted, that any strong opiates are commonly very pernicious, however much the want of sleep and restlessness may seem to demand them. Mild diaphoretics, as *pulv. contrayerv. comp.* with a little castor and saffron, and small quantities of *theriac. Andromachi* or *elixir pargoricum*, have much better effects; which, by raising a gentle easy sweat, or at least a plentiful perspiration, calm the hurry of the spirits, and a refreshing sleep ensues. Where the confusion and defection of spirits are very considerable, galbanum or sulphur should be added, and blisters forthwith applied to the neck, occiput, or behind the ears; and during all this a free use of thin wine, whey, some pleasant ptisan or gruel, with a little soft wine, must be indulged. Indeed the patients, in this case, should drink frequently: though such quantities may not be necessary as in the ardent, or even putrid malignant fevers; yet they should be sufficient to carry on the work of dilution, support the sweats, and supply the blood with fresh and wholesome fluids, in place of that noxious matter which is continually passing off. In this view also a thin chicken-broth is

PRACTICE of service, both as food and physic, especially towards the decline of the disease; and for the same reason thin jellies of hartshorn, gago, panada, are useful, adding a little wine to them, and the juice of Seville orange or lemon.

It is observable, that the sick are never so easy as when they are in a gentle sweat; for this soon removes the hurry of spirits, exacerbations of heat, &c. But profuse sweats should never be encouraged, much less attempted, by very strong heating medicines, especially in the beginning or advance of the fever; for they too much exhaust the vital powers, and are followed by a vast dejection of spirits, tremors, startings of the tendons, and sometimes end in rigors, cold clammy sweats, syncope, or a comatose disposition. Sometimes irregular partial heats and flushes succeed, with great anxiety, restlessness, delirium, difficulty of breathing, and a vast load and oppression in the præcordia, so as to incline the less cautious observer to think there may be something peripneumonic in it; but even here we must beware of bleeding, as the pulse will be found very small and unequal, tho' very quick. Nor is bleeding contra-indicated only by the weakness and fluttering of the pulse, but also by the pale, limpid, and watery urine which is commonly attendant. These symptoms denote the load, anxiety, and oppression on the præcordia to proceed from an affection of the nervous system, and not from a peripneumonic obstruction or inflammation. The breathing, in this case, though thick and laborious, is not hot, but a kind of sighing or fobbing respiration, nor is there often any kind of cough concomitant; so that it evidently proceeds from some spasm on the vitals. Here therefore the nervous cordial medicines are indicated, and blisters to the thighs, legs, or arms. Our author commonly used the following bolus and saline draught.

R. Pulv. contrayerv. c. gr. xv.

Croc. Angl. gr. iij.

Confect. Ralegh. ℞j.

Syr. Croci q. f.

M. f. Bolus.

R. Sal. C. C. ℞s.

Succ. limon. ʒiij.

Aq. alexit. simpl. ʒiſs. M. Peracla effervescentia, adde sp. lavend. c. syr. croc. ana ʒiſs. M. f. Haust.

If great tremors and subsultus tendinum come on, he substitutes half a scruple of musk instead of the contrayerva in the bolus, with advantage. One or other of these, or similar prescriptions, are to be taken every fifth, sixth, or eighth hour, and a temperate cordial julep; *spiritus volatilis aromaticus* or *fetidus*, may be now and then given out of thin wine, or cyder-whey, or, which is in many cases better, out of mustard-whey; which last is by no means a contemptible medicine. The saline draught made as above is much more apt to pass thro' the pores of the skin than when made with salt of wormwood, which rather moves thro' the urinary passages.

The above-mentioned difficulty of breathing, anxiety, and oppression, many times precede a miliary eruption, which often appears on the seventh, ninth, or eleventh day of the fever, and sometimes later. Indeed great anxiety and oppression on the præcordia always precede pustular eruptions of any kind in all

sorts of fevers. This eruption should be promoted by soft easy cordials, and proper diluents; to which should be sometimes added a little theriaca andromachi or elixir athmaticum. These tend to calm the universal uneasiness commonly complained of, and also very effectually promote a diaphoresis, or breathing kindly sweats, with which the miliary eruptions freely and easily advance. But however advantageous these commonly are, profuse sweats are seldom or never so, even though attended with a very large eruption. Two or three crops of these miliary pustules have been known to succeed one another, and large sweats, not only without advantage, but with great detriment to the patients, as they were thereby reduced to an extreme degree of weakness; so that they may justly be reckoned symptomatical rather than any thing else, and the consequent eruption is often merely the symptom of a symptom; for the miliary glands of the skin appear very turgid, and mimic a rash, after profuse sweating, even in the most healthy.

In these profuse colligative sweatings a little generous red wine (diluted somewhat, if necessary) may be given with the greatest advantage; as it presently moderates the sweats, supports the patient, and keeps up the miliary papule if they happen to attend. Towards the decline of the fever also, where the sweats are abundant and weakening, small doses of the tincture of the bark with saffron and snake-root were given with the greatest advantage, frequently interpoling a dose of rhubarb to carry off the putrid colluvis in the first passages; which withal makes the remissions or intermissions that often happen in the decline of nervous diseases more distinct and manifest, and gives a fairer opportunity of throwing in the bark; for in the proper exhibition of this medicine we are to place our chief hope of curing both the nervous and putrid malignant fevers.

XXVII. The putrid, pestilential, or malignant 277  
FEVER. Sp. I. var. 2.

Febris pestilens, P. Sal. Divers. de febre pestilenti.

Febris pestilens Ægyptiorum, Alpin. de med. Ægypt. l. i. cap. 14.

Typhus Ægyptiacus, Sauv. sp. 6.

Febris pestilens maligna, Sennert. de febribus, l. iv. cap. 10.

Febris maligna pestilens, River. l. xvii. sect. iii. cap. 1.

Febris pestilens maligna, ann. 1643. Willis, de febribus, cap. 14.

Typhus carcerum, Sauv. sp. 1.

Febris nautica pestilentialis, Huxham de aëre ad ann. 1740.

Miliaris nautica, Sauv. sp. g.

Febris putrida contagiosa in carceribus genita, Huxham de aëre ad ann. 1742.

Miliaris purpurata, Sauv. sp. h.

Febris carcerum et nosocomiorum. Ill. Pringle, Discales of the army, p. 294. Ill. Van Swieten, Maladies des armées, p. 136.

Typhus castrensis, Sauv. sp. 5.

Febris castrensis, quam vulgo cephalalgiam epidemicam vocant, Henr. Maii et A. Ph. Koph. Diff. apud Hallerum, tom. v.

Febris Hungarica five castrensis, Juncker. 74. et plu-



- plurium auctorum.*  
 Febris castrensis Gallorum in Bohemia, ann. 1742. *Scrini.* Diff. apud *Haller.* tom. v.  
 Febris petechialis, *Sennert.* l. iv. cap. 13. *River.* prax. l. xvii. sect. iii. cap. 1. *Hoffm.* II. p. 84.  
*Junker.* 73. *Huxham* on fevers, chap. 8. *Ludwig.* Inst. med. clin. n° 146. *Schreiber* von erkenntniss, und cur der Krank heiten. p. 126.  
*Monro.* Diseases of military hospitals, p. 1.  
 Febris catarrhalis maligna petechizans, *Junker* 72. *Hoffm.* II. 75. *Eller* de cogn. et cur. morb. sect. vi.  
 Febris quæ lenticularis, puncticula, aut peticulas vocant, *Racæstorius* de morb. contag. lib. ii. cap. 6.  
 Febris peticularis Tridenti, ann. 1591, *Roboretus* de febr. peticul.  
 Febris petechialis epidemica Coloniz ann. 1672. *Donckers.* Idea febris petechialis.  
 Febris petechialis epidemica Posonii 1683, *C. F. Loeu* in App. ad A. N. C. vol. ii.  
 Febris petechialis epidemica Mutinz, 1692. *Ramazzini.* Const. Mutinensis, oper. p. 187.  
 Febris maligna petechizans, ann. 1698. *Hoffm.* II. p. 80.  
 Febris petechialis Wratislaviæ ann. 1699. *Helwich.* Ephem. Germ. D. III. A. VII. et VIII. obf. 132. p. 616.  
 Febris epidemia Lipsiz 1718. *M. Adolph.* A. N. C. III. obf. 131. p. 296.  
 Febris endemica et epidemica Corcagiensis ann. 1708, 1718, et seq. *Rogers.* Essay on epidemic diseases.  
 Febris continua epidemica Corcagiensis ann. 1719. et seq. *M. O Connel* Obf. de morbis.  
 Febris petechialis epidemica Cremonæ 1734. *Valcharengki* Med. ration. sect. iii.  
 Febris petechizans Petropoli 1735. *Weitbrecht.* Diff. apud *Haller.* tom. v.  
 Febris petechialis, ann. 1740, 1741, in Hassia, *Ritter.* A. N. C. vol. vii. obf. 4.  
 Febris maligna petechialis Rinteli 1741. *Furstenau.* A. N. C. vol. vii. obf. 5.  
 Febris petechialis epidemica Silisiz 1741 et seq. *Brandhorst.* Diff. apud *Haller.* tom. v.  
 Febris petechialis epidemica Viennæ 1757. *Hafenohrl.* Hist. med. cap. 2.  
 Febris petechialis epidemica Lipsiz 1757. *Ludwig.* Adversar. tom. i. pars 1.  
 Febris petechialis epidemica variis Germaniz locis ab. ann. 1755 ad 1761. *Strack* de morbo cum petechiis.

*Description.* This is a disease of the most dangerous nature, as, besides the extreme debility of the nervous system, there is a rapid tendency of the fluids to putrefaction, which sometimes cuts off the patient in a few days, nay, in the warm climates, in 12 or 14 hours; or if the patient recovers, he is for a long time, even in this country, in an exceedingly weak state, and requires many weeks to recover his former health.

The putrid fevers, according to *Huxham*, make their attack with much more violence than the slow nervous ones; the rigors are sometimes very great, though sometimes scarce felt; the heats much sharper and permanent; yet, at first, sudden, transient, and remittent: the pulse more tense and hard, but common-

ly quick and small; though sometimes slow, and seemingly regular for a time, and then fluttering and unequal. The head-ach, nausea, and vomiting, are much more considerable even from the beginning. Sometimes a severe fixed pain is felt in one or both temples, or over one or both eye-brows; frequently in the bottom of the orbits of the eyes. The eyes always appear very dull, heavy, yellowish, and very often a little inflamed. The countenance seems bloated, and more dead-coloured than usual. Commonly the temporal arteries throb much, and a tinnitus aurium is very troublesome: a strong vibration also of the carotid arteries frequently takes place in the advance of the fever, though the pulse at the wrist may be small, nay even slow: this is a certain sign of an impending delirium, and generally proceeds from some considerable obstructions in the brain.

The prostration of spirits, weakness, and faintness, are often surprisingly great and sudden, though no inordinate evacuation happens; and this too sometimes when the pulse seems tolerably strong. The respiration is most commonly laborious, and interrupted with a kind of sighing or sobbing, and the breath is hot and offensive.

Few or none of these fevers are without a sort of lumbago, or pain in the back and loins; always an universal weariness or soreness is felt, and often much pain in the limbs. Sometimes a great heat, load, and pain, affect the pit of the stomach, with perpetual vomiting of porraceous or black choler, and a most troublesome singultus; the matter discharged is frequently of a very nauseous smell. The tongue, tho' only white at the beginning, grows daily more dark and dry; sometimes of a shining livid colour, with a kind of dark bubble at top; sometimes exceeding black; and so continues for many days together; nor is the tinge to be got off many times for several days, even after a favourable crisis: at the height of the disease, it generally becomes vastly dry, stiff, and black, or of a dark pomegranate colour. Hence the speech is very inarticulate, and scarce intelligible. The thirst in the increase of the fever is commonly very great, sometimes unquenchable; and yet no kind of drink pleases, but all seem bitter and mawkish; at other times, however, no thirst is complained of, tho' the mouth and tongue are exceedingly foul and dry; this is always a dangerous symptom, and ends in a frenzy or coma. The lips and teeth, especially near the state, are furred up with a very black tenacious sordes. At the onset of the fever, the urine is often crude, pale, and vapid, but grows much higher-coloured in the advance, and frequently resembles a strong lixivium, or citrine urine, tinged with a small quantity of blood; it is without the least sediment or cloud, and so continues for many days together: by degrees it grows darker, like dead strong high-coloured beer, and smells very rank and offensive. In petechial fevers, the urine hath often been seen almost black and very fetid. The stools, especially near the state, or in the decline of the fever, are for the most part intolerably fetid, green, livid, or black, frequently with severe gripes and blood. When they are more yellow or brown, the less the danger; but the highest when they run off insensibly, whatever their colour may be. It is likewise a very bad symptom when the belly continues tense,

tenfe, swollen, and hard, after profufe stools; for this is generally the confequence of an inflammation or mortification of the intestines. A gentle diarrhoea is often very beneficial, and sometimes seems to be the only way which nature takes to carry off the morbid matter.

Sometimes black, livid, dun, or greenish spots appear, which always indicate a high degree of malignity; however, the more florid the spots are, the less danger is to be feared. It is also a good sign when the black or violet petechiæ become of a brighter colour. The large, black, or livid spots, are almost always attended with profufe hæmorrhages; and the small, dusky, brown spots, like freckles, are not much less dangerous than the livid or black; though they are seldom accompanied with fluxes of blood: excessively profufe, cold, clammy sweats are often concomitant, by which also they sometimes vanish, though without any advantage to the patient. The eruption of the petechiæ is uncertain; sometimes they appear on the fourth or fifth day, though sometimes not till the eleventh, or even later. The *vibices*, or large, dark, greenish marks, seldom appear till very near the fatal period. Frequently also we meet with an efflorescence like the measles in malignant fevers, but of a much more dull and livid hue; in which the skin, especially on the breast, appears as it were marbled or variegated. This in general is an ill symptom, and is often attended with fatal consequences.

Sometimes about the 11th or 14th day, on the coming on of profufe sweats, the petechiæ disappear, and vast quantities of white milary pustules break out. This is seldom found of any considerable advantage; but an itching, smarting, red rash, commonly gives great relief; and so do the large, fretting, watery bladders, which many times rise upon the back, breast, shoulders, &c. A scabby eruption likewise about the lips and nose is certainly one of the salutary symptoms; and the more hot and angry it is, so much the better. But of much more uncertain and dangerous event are the brown-coloured aphthæ; nor are those that are exceeding white and thick like lard, of a very promising aspect. They are soon succeeded by great difficulty of swallowing, pain and ulceration of the fauces, œsophagus, &c. and with an incessant singultus: the whole *prima via* become at last affected; a bloody dysentery comes on, followed by a sphacelation of the intestines; as is evident from the black, sanious, and bloody stools, extremely fetid and infectious. *Vibices*, or large, black, and bluish marks resembling bruises, are frequently seen towards the close of the fever; and, when attended with lividity and coldness of the extremities, are certain tokens of approaching death. In some cases, the blackness hath been known to reach almost to the elbows, and the hands have been dead-cold for a day or two before the death of the patient.

Such are the general appearances of the putrid malignant fever in this country, among those who enjoy a free air, and are not crowded together, or exposed to the causes of infection: but in jails, hospitals, or other places where the sick are crowded, and in some measure deprived of the benefit of the free air, the symptoms are, if possible, more terrible. Sir John Fringle, who had many opportunities of observing it,

tells us, that the jail or hospital fever, in the beginning, is not easy to be distinguished from a common fever. The first symptoms are slight interchanges of heat and cold, a trembling of the hands, sometimes a sense of numbness in the arms, weakness of the limbs, loss of appetite; and the disorder increasing towards night, the body grows hot, the sleep is interrupted, and not refreshing. With these symptoms, for the most part, there is some pain or confusion in the head; the pulse at first is a little quicker than natural, and the patients find themselves too much indisposed to go about business, though too well to be wholly confined. When the fever advances, the above-mentioned symptoms are in a higher degree; and in particular the patient complains of a lassitude, nausea, pains in his back, a more constant pain and confusion in his head, attended with an uncommon dejection of spirits. At this time the pulse is never sunk, but beats quick, and often varies in the same day both as to strength and fulness. It is little affected by bleeding once, if a moderate quantity of blood is taken away; but if the evacuation is large, and especially if it is repeated, to answer a false indication of inflammation, the pulse, increasing in frequency, is apt to sink in force, and often irrecoverably, whilst the patient becomes delirious. But withal we must observe, that, in every case, independent of evacuations, the pulse sooner or later sinks, and then gives certain intelligence of the nature of the disease. The appearance of the blood is various; for though it is commonly little altered, yet sometimes it will be fizy, not only on the first attack, but after the fever is formed. The worst appearance is when the crassamentum is dissolved; though this does not happen till the advanced state of the fever: though indeed this seems not easy to be ascertained, as blood has been so seldom taken away at that time. The urine is also various. Sometimes it is of a reddish or flame colour, which it preserves a long time; but it is oftener pale, and changes from time to time in colour as well as crudity, being sometimes clear, sometimes clouded: towards the end, upon a favourable crisis, it becomes thick, but does not always deposit a sediment. If the sick lie warm, and have had no preceding flux, the belly is generally bound; but when they lie cold, as they often do in field-hospitals, the pores of the skin being shut, a diarrhoea is a common symptom, but is not critical. In the worst cases, a flux appears in the last stage; then the stools are involuntary, colligative, ichorous, or bloody, and have a cadaverous smell; the effects of a mortification of the bowels, and the sign of approaching death. When the hospitals are filled with dysenteric patients, some of the nurses will be infected with the flux only, and others with this fever, ending in these bloody and gangrenous stools.

In the beginning the heat is moderate; and even in the advanced state, on first touching the skin, it seems inconsiderable; but upon feeling the pulse for some time, we are sensible of an uncommon ardour, leaving an unpleasant sensation on the fingers for a few minutes after. A day or two before death, if care is not taken, the extremities become cold, and the pulse is then hardly to be felt. The skin is generally dry and parched; though sometimes there are longer or shorter sweats, especially in the beginning. Such as  
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are produced by medicine are of no use, except on the first attack, at which time they will often remove the fever; and natural sweats are never critical till the distemper begins to decline. These last are rarely profuse, but gentle, continued, and equally diffused over the body: sometimes the disease will terminate by an almost imperceptible moisture of the skin; the sweats are usually fetid, and offensive even to the patient himself.

The tongue is commonly dry; and, without constant care of the nurse, becomes hard and brown, with deep chops: but this symptom is common to most fevers. At other times, though rarely, the tongue is soft and moist to the last, but with a mixture of a greenish or yellowish colour. The thirst is sometimes great, but more frequently moderate. In the advanced state, the breath is offensive, and a blackish furring gathers about the roots of the teeth.

Some are never delirious, but all lie under a stupor or confusion; few retain their senses till death: many lose them early, and from two causes; either from immoderate bleeding, or the premature use of warm and spirituous medicines. They rarely sleep; and, unless delirious, have more of a dejected and thoughtful look than what is commonly seen in other fevers. The face is late in acquiring either a ghastly or a very morbid appearance; yet the eyes are always muddy, and generally the white is of a reddish cast as if inflamed. The confusion of the head generally rises to a delirium, especially at night; but, unless by an unseasonable hot regimen, it seldom turns to rage, or to those high flights of imagination common in other fevers. When the delirium comes to that height, the face is flushed, the eyes red, the voice is quick, and the patient struggles to get up. But when that symptom is owing to large evacuations, or only to the advanced state of the disease, the face appears meagre; the eye-lids in slumbers are only half shut; and the voice, which is commonly low and slow, sinks to a degree scarce to be heard. From the beginning there is generally a great dejection and failure of strength. A tremor of the hands is more common than a starting of the tendons; or if the subfultus occurs, it is in a lesser degree than in many other fevers. In every stage of the disease, as the pulse sinks, the delirium and tremor increase; and in proportion as the pulse rises, the head and spirits are relieved. Sometimes in the beginning, but for the most part in the advanced state, the patient grows dull of hearing, and at last almost deaf. When the fever is protracted, with a slow and low voice, the sick have a particular craving for something cordial, and nothing is so cordial or so acceptable as wine. They long for no food, yet willingly take a little panada if wine be added. But such as are delirious, with a quick voice, wild looks, a subfultus tendinum, or violent actions, though their pulse be funky, yet bear neither hot medicines, wine, nor the common cordials.

Vomiting, and complaints of a load and sickness at stomach, though usual symptoms, are not essential to the disease; nor are pleuritic stitches, difficulty in breathing, or flying pains, to be referred so much to it as to the constitution of the patient, or to a preceding cold.

A petechial efflorescence is a frequent, though not an inseparable, attendant of this fever. It sometimes

appears of a brighter or paler red, at other times of a livid colour, but never rises above the skin. The spots are small; but generally so confluent, that at a little distance the skin appears only somewhat redder than ordinary, as if the colour was uniform; but upon a nearer inspection there are interstices seen. For the most part this eruption is so little conspicuous, that unless it is looked for attentively it may escape notice. The spots appear thickest on the back and breast, less on the legs and arms, and our author never remembers to have seen any on the face. As to the time of their appearance, he agrees entirely with Dr Huxham. These spots are never critical, nor are they reckoned among the mortal symptoms; but only concur with other signs to ascertain the nature of the disease. The nearer they approach to purple, the more they are to be dreaded. In a few cases, instead of spots, purple streaks and blotches were observed. Sometimes the petechiæ did not appear till after death; and there was one case in which, after bleeding, the petechiæ were seen only on the arm below the ligature, and nowhere else on the skin.

The hospital-fever, though accounted one of the continued kind, yet has generally some exacerbation at night, with a remission and often partial sweats in the day; and after a long continuance it is apt to change into a hectic, or an intermitting form. The length of the disease is uncertain. Sometimes it will terminate, either in death or recovery, in seven days after the patient took to his bed; but in the hospitals it generally continued from 14 to 20, and some died or recovered after four weeks. From the time of the sinking of the pulse until death or a favourable crisis, there is perhaps less change to be seen from day to day in this than in most other fevers. When its course is long, it sometimes terminates in suppurations of the parotid or axillary glands; and when these do not appear, it is probable that the fever is kept up by the formation of some internal abscess. The parotid glands themselves do not suppurate, but only some of the lymphatic glands that lie over them. Our author observed one instance of a swelling of this kind on both sides, without any previous indisposition, when the person, not suspecting the cause, and applying discutient cataplasms, was, upon the tumour subsiding, seized with the hospital-fever. Many patients after the crisis of this fever complain of a pain in the limbs, and want of rest; and almost all of them mention great weakness, confusion in their head, vertigo, and a noise in their ears.

Ten of the bodies of those who died of this distemper in Houghton's regiment were opened. In some, all the cavities were examined; in others, only the brain or the bowels. In some of them, the brain appeared to be suppurated. The first of this kind our author met with at Ghent; but the man being brought into the hospital from the barracks no earlier than two days before he died, he could only conjecture from the symptoms and the imperfect accounts he had of him, that his death was owing to a fever of this kind, after lingering near a month in it. About three ounces of purulent matter were found in the ventricles of the brain, and the whole cortical and medullary substance was uncommonly flaccid and tender; nay, some of the same kind of matter was found in the substance of the



the upper part of the cerebellum: yet this person, with some flupor and deafness, had his senses till the night before he died; so far, at least, that he answered distinctly when roused and spoken to; but about that time the muscles of his face began to be convulsed. Of two other instances of men who undoubtedly died of this fever, in one the cerebrum was suppurated, in the other the cerebellum. In the former case, the patient was under a flupor, with deafness from the beginning; but was never delirious, nor altogether insensible. His pulse sunk early: and about ten days before his death his head began to swell, and continued very large till within two days before he died, when it subsided a little. For several days before his end, he would taste nothing but cold water, and during his illness he lay constantly upon one side. The head being opened, an abscess as large as an egg was found in the substance of the forepart of the right hemisphere of the brain, full of thin matter like whey. At that time five more, ill of the same fever, had the like swelling of their heads, but recovered. In the other case, the abscess in the cerebellum was about the size of a small pigeon's egg, and contained also a thin ichorous matter; nor had this patient ever been so thoroughly insensible as not to answer reasonably when spoken to. Two days before he died his urine turned pale.

These suppurations, however, were not constant; for another who died about the same time, and had been ill about the same number of days with the like symptoms, the pale water excepted, had no abscess either in the brain or cerebellum. And two were opened afterwards, in whom the cortical substance of the brain had an inflammatory appearance, but no suppuration. In one of them the large intestines were corrupted: that man went off with a looseness; and just before he died, an ichorous matter was discharged from his nose. In the military hospital at Ipswich, one who unexpectedly died of this fever after having been seemingly in a fair way of recovery, had no suppuration in his brain; but in another, who died after an abscess in both orbits, the brain was found flaccid, and about two ounces of a thin serum in the ventricles.

*Causes of, and persons subject to, this disorder.* The cause of this fever, as well as that of the slow nervous fever, is an infection or contagion from some diseased animal-body, or from corrupted vegetables; and therefore is very little, if at all, different from those pestilential disorders which have arisen after battles, when great numbers of dead bodies were allowed to lie above ground and infect the air with their effluvia. This is confirmed by an observation of Forelius, who was eyewitness to a distemper of this kind, (which indeed he calls a *plague*), owing to the same cause, attended with buboes and a high degree of contagion. The same author also gives an account of a malignant fever breaking out at Egmont in North-Holland, occasioned by the rotting of a whale which had been left on the shore. We have a like observation of a fever affecting the crew of a French ship, by the putrefaction of some cattle which they had killed on the island of Nevis in the West Indies. These men were seized with a pain in their head and loins, great weakness, and a disorder of the stomach, accompanied with fever. Some had carbuncles; and on others purple spots appeared

after death.

Galen assigns two causes for pestilential fevers: 1. The great heat of the weather, when the humours happen to be in a more putrescent state than usual. 2. A putrid state of the air, arising either from a multitude of dead bodies left unburnt, as after a battle, or from the evaporation of corrupted lakes and marshes.

One of the most remarkable diseases incident to an army is related by Diodorus, as breaking out among the Carthaginians at the siege of Syracuse. That author not only relates some of its most distinguishing symptoms, but reasons well about its cause. He observes, that pains in the back and eruptions (*phantomas*) were common; that some had bloody stools; that others were seized with a delirium, so as to run about and beat all that came in their way; that the physicians knew no cure; and that it was the more fatal as the sick were abandoned by every body on account of the contagion. As to the cause, the author takes notice of the multitude of people confined within a narrow compass; of the situation of the camp in a low and wet ground; of the scorching heats in the middle of the day, succeeded by the cold and damp air from the marshes in the night-time; he adds, the putrid steams arising first from the marshes, and afterwards from the bodies of those who lay unburied. This distemper seems to have been a compound of the marsh and pestilential fever.

Forelius remarks, that, from the putrefaction of the water only, the city of Delft, where he practised, was scarce ten years together free from the plague or some pestilential distemper. He adds, that the magistrates, upon his representation of the cause, erected a wind-mill for moving and refreshing the water. At that time Holland was much more subject to inundations and the stagnation of water than at present. In 1694, a fever broke out at Rochfort in France, which, on account of the uncommon symptoms and great mortality, was at first believed to be the plague. But M. Chirac, who was sent by the court to inquire into its nature, found the cause to arise from some marshes that had been made by an inundation of the sea; and observed, that the corrupted steams, which smelled like gun-powder, were carried to the town by the wind, which had long blown from that quarter. About two-thirds of those who were taken ill died. In such as were opened, the brain was found either inflamed or loaded with blood; the fibres of the body were uncommonly tender; and the bowels had either suppurated or were mortified.

It is needless to mention more instances of pestilential fevers being brought on by the steams of corrupted substances, whether animal or vegetable. In general it may be remarked, that the putrefaction of these substances in a dry air is more apt to bring on a fever of the continued form; but in a moist air hath a greater tendency to produce remitting fevers. But it must also be observed, that, even in cases where the most malignant fevers prevail, all persons are not equally disposed to receive the infection, tho' equally exposed to it with others. Some, through mere vigour of body and mind, cannot be infected with the most contagious diseases; while, on the other hand, those whose bodies are debilitated by a former disease,

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by study, low diet, or want, or those who have laboured under any of the depressing passions, of the mind for some time, seldom or never escape. Men, therefore, who have been weakened by accidents (as those who have undergone a mercurial salivation) are very apt to fall into this distemper. Those who are taken into crowded hospitals, ill of the small-pox, however good the fort may be, fall readily into this fever, and run a greater risk of dying of it than others. The second fever is attended with double danger, seeing the patient has been so much weakened by the first. A sure sign of the corruption of the air in an hospital is when many of the nurses fall sick.

*Prognosis.* In these fevers we cannot draw a prognostic from any symptom by itself; and perhaps all of them together are more fallible than in others. Generally the following are good: To have little delirium; the strength little impaired; turbid urine in the decline of the disease; and at that time a gentle sweat or moisture diffused over the body, or even the skin soft and the tongue moist; or to have some loose stools succeeded by a diaphoresis; the pulse to rise by wine or cordials, with an abatement of the stupor, tremor, and other affections of the brain. Deafness is rather a good sign. A sediment in the urine, without other changes to the better, is no sure sign of recovery; and some have recovered in whose water there was no sediment.—The bad signs are, a subfultus tendinum; the eyes much inflamed and staring; the speech quick, and the sound of the voice altered; a high delirium; perpetual watchfulness; constant sickness at the stomach, and vomitings; frequent stools, with a sinking pulse, and the disorder of the head increased; coldness of the extremities, and a tremulous motion of the tongue. It is observed to be among the worst signs when the patient complains of blindness; when he swallows with difficulty, or cannot put out his tongue when desired to do it; when he can lie on his back only, and pulls up his knees; or when infensible he endeavours to uncover his breast, or makes frequent attempts to get out of bed without assigning any reason. If to any of these are added ichorous, cadaverous, and involuntary stools, it is a sign of a mortification of the bowels and approaching death. It will not seem strange to find most of these prognostics common to the advanced state of other fevers, when we consider, that from whatever cause fevers begin, by a long continuance the humours are corrupted, and the brain and nerves affected much in the same manner as in those which arise from infection.

*Prevention and cure.* As distempers of the putrid kind never arise without an infection received from some quarter or other, the methods of prevention must evidently be reduced to two general heads. 1. To avoid receiving the infection into the body; and, 2. To put the body in such a situation as may enable it to resist the infection when received. On both these methods scarce any writer hath equalled Dr Lind of Hallar, whose opinions and directions therefore we shall give pretty fully.

As putrid diseases are very common and violent in the hot countries, it is very necessary for Europeans who visit these climates to be well informed, in the first place, of the signs of an unhealthy country, that they may be upon their guard as soon as they enter any fo-

reign region. These signs are by our author enumerated as follows.

1. A sudden and great alteration in the air, at sunset, from intolerable heat to a chilling cold. This is perceived as soon as the sun is down, and is for the most part accompanied with a very heavy dew: it shews an unhealthy swampy soil, the nature of which is such, that no sooner the sun-beams are withdrawn, than the vapours emitted from it render the air damp, raw, and chilling, in the most sultry climates; so that even under the equator, in some unhealthy places, the night-air is very cold to an European constitution.

2. Thick noisome fogs, chiefly after sunset, arising from the valleys, and particularly from the mud, slime, or other impurities. In hot countries, the smell of these fogs may be compared to that of a new-cleaned ditch. Diseases therefore, arising from this cause, generally take place in the night, or before sun-rising.

3. Numerous swarms of flies, gnats, and other insects which attend stagnated air and unhealthy places covered with wood.

4. When all butchers meat soon corrupts, and in a few hours becomes full of maggots; when metals are quickly corroded on being exposed to the air; and when a corpse becomes intolerably offensive in less than six hours; these are proofs of a close, hot, and unwholesome country. And in such places, during excessive heats and great calms, it is not altogether uncommon for Europeans, especially such as are of a gross habit of body, to be seized at once with the most alarming and fatal symptoms of what is called the *yellow fever*, without even any previous complaint of sickness or other symptoms of the disease. There has first been perceived an uneasy itching sensation, commonly in the legs; and upon pulling down the stockings, streams of thin dissolved blood followed, a ghastly yellow colour quickly diffused itself over the whole body, and the patient has been carried off in less than forty-eight hours.

5. A sort of sandy soil, commonly a small, loose, white sand, as that at Penfacola, Whydah, and the island of Bonavista, which is found by experience to be injurious to health. The pestiferous vapour arising, during the summer months and in the heat of the day, from such a sandy soil, is best characterized by its effects in the extensive deserts of Asia and Africa. It there constitutes what is called the *Samiel wind*; a blast which, in the parched desert, proves instantly fatal both to man and beast: but when it passes over a soil well covered with grass and vegetables, has its effects greatly mitigated; it is, however, even then, productive of sickness: thus the southerly winds, while they blow from the deserts of Libya during the summer, at Algiers, Tunis, and Tripoli, produce an unhealthy season; and at Madras the winds, which, in the months of April and May, pass over a large tract of sand, are always hot, disagreeable, and unwholesome.

During these land-winds, sudden gusts of a more hot and suffocating nature are often observed to come from those sands once or twice, or even more frequently, in a day, which seem to be this vapour in a purer form. These gusts pass very quickly, and affect persons who happen to stand with their faces towards them in the same manner as the hot air which issues from

PRACTICE from a burning furnace, or from a heated oven, and obliges them immediately to turn away from it in order to recover breath. The effect of this hot suffocating blast or vapour on the human body, even when mitigated by passing through a moist atmosphere, is the same as that of intense cold; it shuts up every pore of the skin, and entirely stops the perspiration of such as are exposed to it. These blasts come only in the day-time, and always from the deserts. Water is the only known corrector or antidote against them: hence, coarse thick clothes, kept constantly wet, and hung up at the windows, or doors, greatly mitigate their violence. A house so built as to have no windows or doors towards the deserts, is an excellent protection against their pernicious effects. The hot land-winds constantly blow at Madras, and other places on the coast of Coromandel, at that season, from midnight till noon; the sea-breezes then begin, which relieve the difficulty in breathing and the obstructed perspiration which the former occasioned.

That the heat of these land-winds, as also of the sudden gusts which accompany them, proceed from large tracts of sand heated by the sun, is evident from the increased heat and suffocating quality of those winds, in proportion as the day advances, and as the heat of the season is increased. The opposite winds blowing from each side of the Balagate-mountains, are a farther proof of this. These mountains, running from north to south, divide the hither Peninsula of India into two unequal parts, and separate what is called the *Malabar* from the *Coromandel* coast. To the former they are very near, but at a great distance from the latter. The winds blowing from those hills are on the Malabar-coast always remarkably cool; but on the coast of Coromandel, in the months of April, May, June, and July, are extremely hot and suffocating, as they pass over a large tract of intermediate sand, heated during those months by an almost vertical sun. Hence the Malabar coast is always covered with an agreeable verdure; whereas the Coromandel-coast, during the continuance of these hot winds, seems a barren wilderness, nothing appearing green except the trees. On the contrary, the winds that pass over these sands after being wet with the rains, are the coldest which blow at Madras. Bottles of liquor inclosed in bags of coarse cloth, kept constantly wet, and suspended in the shade, where those hot winds may have access to them, become as cold as if they had been immersed in a solution of nitre; an effect owing undoubtedly to the constant evaporation of water from the surface. See *COLD* and *EVAPORATION*.

It is an observation of the natives on the coast of Coromandel, which is confirmed by the experience of many Europeans, that the longer the hot land-winds blow, the healthier are the ensuing months; these winds, as they express it, purifying the air. Are not the winds therefore the cause why the air on the coast of Coromandel, except during their continuance, is more healthy than in other parts of India where these winds do not blow? Does not this also suggest a very probable reason, why the plague in Egypt generally ceases in the beginning of June; the periodical hot winds which come from the deserts of Nubia and Ethiopia having then rendered the air of Egypt pure

and wholesome? Many have ascribed that effect to the north-winds; as the plague not only ceases when they blow, but all infected goods, household-furniture, and wearing apparel, are then said to become entirely free from the contagion: these, however, cannot be the cause, as the most destructive plague is abated in its violence, if not wholly eradicated, before they set in. With equal propriety we may reject the opinion that the overflowing of the Nile is productive of that salutary effect, as the plague generally ceases before the increase of that river is perceptible.

Thus the plague, the greatest calamity which can afflict mankind, seems to be destroyed by these hot winds, which are otherwise so pernicious to animal and vegetable life. And although, during the continuance of these winds, the most fruitful fields wear the aspect of a parched desert, yet no sooner the rains fall, but vegetation is restored, the plants revive, and a beautiful verdure is again spread over the face of the country.

Having thus given an account of the signs of an unhealthy country, our author next proceeds to mention such employments as are particularly dangerous to Europeans on their first arrival. One of these is the cutting down of trees, shrubs, &c. or *clearing the ground* as it is called. Of the unhealthiness of this employment he gives two instances. At the conclusion of the late peace, the captain of a ship of war went on shore at the island of Dominica, with 12 of his men, to cut down the wood, and to clear a piece of ground which he intended to have purchased: but, in a few days, sickness obliged him to desist from this dangerous work; the captain and 11 of his men being seized with violent fevers, which terminated in obdurate intermittents, and of which several died. The survivors suffered so much in their constitutions, that, even after they came to England, the return of an east-wind was apt to bring on a violent fit of the ague. The *Ludlow-Castle*, a ship of war of 40 guns, in a voyage to the coast of Guinea, also lost 25 of her men, at Sierra Leona, who were employed in cutting down wood for the ship. This is an occupation which has often proved destructive to Europeans in those climates, and in which they ought never to be employed, especially during the rainy season; there being numberless instances of white persons, when cutting down the woods at that season, who have been taken ill in the morning, and dead before night.

Another evil, less known, and less suspected, but no less dangerous, is the sending of Europeans in open boats after sunset, where the soil is swampy, or where there are great night-fogs. The single duty alone of fetching fresh-killed butchers meat at night for the use of our ships companies in the East and West Indies, has destroyed every year several thousand seamen. In those parts of the world, butchers meat must be brought on board at night immediately after it is killed, otherwise it will not be fit for use the next day; but a contract made with the natives to send it on board at that time, which might be done for a trifling sum, would be the means of preserving many useful lives. During the sickly season at Batavia, a boat belonging to the Medway, which attended on shore every night, was three times successively manned, not one having survived that service. They were all taken ill in the night, when on shore, or when returning on board; so that



at length the officers were obliged to employ none but the natives on that business. Great numbers of men have perished from being employed in this manner at Bengal, where the European ships often anchor in the most unhealthy spots of the river; and even when the great night-fogs arise, after the rainy season, the men are often obliged to perform such night-services in boats. Now since it is so dangerous for Europeans in unhealthy countries, particularly during a season of sickness, to be exposed in an open boat to the foggy night-air, it must appear, that fending them unprotected, in open boats, far up rivers, in unhealthy southern climates, for the sake of wood, water, trade, or other purposes, must be attended with the most destructive and fatal consequences.

Burying the dead in swampy countries is another occupation which has proved fatal to many, and which ought to be entrusted to negroes or the natives of the country. The effluvia from the ground when newly opened, whether from graves or ditches, are far more dangerous than from the same swampy soil when the surface is undisturbed; nay, in some places, it has been found almost certain death for an European to dig a grave, unless long seasoned to the country. In such a place, the attendance of friends at funerals ought to be dispensed with.

In all cases where it is practicable, the ships which visit these unhealthy countries should anchor at as great a distance as possible from shore; or if obliged to anchor near marshy grounds or swamps, especially during summer or in hot weather, and when the wind blows directly from thence, the gun-ports which would admit the noxious land-breeze ought to be kept shut, especially at night. Or if the ship rides with her head to the wind, a thick sail ought to be put upon the fore-mast, along which the smoke from the fire-place might be made constantly to play and ascend. If the sail should occasion a little smoke between decks, this inconvenience will be sufficiently compensated by its keeping off the direct stream of the swampy shore effluvia; which now being obliged to form a curve before they reach the more distant parts of the vessel, must needs be greatly diverted and scattered.

The best preservative against the mischievous impressions of a putrid fog, or of a marshy exhalation, is a clofe, sheltered, and covered place; such as the lower apartments in a ship, or a house in which there are no doors or windows facing the swamps. If in such places a fire is kept either at the doors and other inlets to a house, or in the chambers, as is practised in some unhealthy countries during the rainy or foggy season, it will prove an excellent and effectual protection against the injuries of a bad air. On board of ships also fires may be made at the hatchways; and of the good effects of this, we have the following example. When the *Edgar*, a ship of war of 60 guns, was upon the coast of Guinea in the year 1768, her men were very sickly, and many of them died; whereas it was observed, that in a sloop of war, which was constantly in company with her, few were taken ill, and not one died during the whole voyage. This could be ascribed to no other cause, but that in the sloop the fireplace for cooking victuals was on the same level with the deck where the men lay; and every morning when the fire was lighted, especially when there was

but little wind, the smoke from the cook-room spread itself all over the ship, and particularly over those parts where the men lay; but from the construction of the fire-place of the *Edgar*, no smoke from it ever came between her decks.

Persons on board any ship whatever, are much more safe, and their situation is much preferable to that of those who make distant inland excursions in small boats upon the rivers, and who are for the most part ignorant of the cause of those maladies which destroy them. The intolerable heat at noon often obliges such persons to go in a manner half-naked; while a free and plentiful perspiration issues from every pore. A near approach to putrid swamps at this time is apt to produce an immediate sickness, vomiting, and afterwards a low nervous or malignant fever. But if they happen to pass them at night, or lie near them in an open boat, the air from those swamps is perceived to be quite chill and cold; in so much that warm thick clothing becomes absolutely requisite to guard the body against the imperfections of so great an alteration in the air, and against its cold and inclement quality; for the effects of it then, even on the most healthy and vigorous constitution, is frequently a chilling cold fit of an ague, terminating in a fever with delirium, bilious vomitings, a flux, or even death itself.

But where such exposure becomes unavoidable, the only method is then to defend the body as much as possible against the pernicious miasmata with which the air abounds.—All those who are employed in cutting down woods, or in other laborious and dangerous services in hot climates, during the heat of the day ought to have their heads covered with a bladder dipt in vinegar, and to wash their mouths often with the same liquor; never to swallow their spittle, but rather to chew a little rhubarb or some other bitter and spit it out frequently; to stop their nostrils with a small bit of linen, or tow, dipped in camphorated vinegar; and to infuse some bark, garlic, and rhubarb, in brandy, of which a dram is to be taken, either by itself or diluted with water, morning and evening.

In the evening before sunset they should leave off work, and not return to their labour in the morning till the sun has dispersed the unwholesome dews and vapours. Those who must of necessity remain on shore, and sleep in dangerous places, must take care not to sleep upon the ground exposed to the dews, but in hammocks in a clofe tent, standing upon a dry sand, gravel, or chalk, near the sea shore, and where there is no subterraneous water for at least four feet below the surface of the ground. The door of this tent should be made to open towards the sea; and the back part of it which receives the land breeze, must be well secured by double canvass, or covered with branches of trees. But in such circumstances, a hut, when it can be procured, is preferable to a tent, especially if it is well thatched, so as to prove a defence both against the excessive heat of the sun by day, and the noxious dews which fall at night. Here the men may be enjoined to smoke tobacco. When the air is thick, moist, and chill, the earth being overpread with cold dew, a constant fire must be kept in and about the tent or hut, as the most excellent means of purifying such unwholesome air, and of preserving the health

PRACTICE health of those who either sleeping or waking are exposed to its influence. The centinels who guard the water-casks, ought likewise at such a time to have a fire burning near them. All old and forsaken habitations, natural caves and grottoes in the earth, where the men may be induced to take up their abode, must, before their admission, be perfectly dried and purified with sufficient fires. Fire and smoke are undoubtedly the great purifiers of all tainted and unwholesome air, and the most excellent preservatives against its noxious influence. It is the custom of the negroes in Guinea, as also of some Indians, (who both sleep for the most part on the ground), to have a fire, producing a little smoke, constantly burning in their huts where they sleep. This not only corrects the moisture of the night, but also, by occasioning more smoke than heat, renders the damp from the earth less noxious; of which our author gives the following remarkable instance. A Guinea ship being up one of the rivers for the sake of trade, it was found to be very dangerous to sleep on shore; without which their trade could not be so conveniently carried on. First the captain, then the mate, and two or three of the seamen, were taken ill; each of them the morning after they had lain on shore. By these accidents the men were greatly intimidated from lying ashore; till the surgeon boldly offered to try the experiment on himself. Next morning when he waked, he found himself seized, as the rest, with a giddiness and pain in the head, &c. He immediately acquainted one of the negroes with his condition, who carried him to his hut, and set him down in the smoke of it; when his shiverings and giddiness soon left him. He then took a dram of the bark bitter; and found himself greatly relieved, especially by breathing some time in the smoke.—Thus instructed by the negro, he ordered a large fire to dry the hut he slept in; and afterwards had every night a small fire sufficient to raise a gentle smoke, without occasioning a troublesome heat: and by this means he and several others, using the same precautions, slept many nights on shore without any inconvenience.

Fire and smoke indeed are found to be certain correctors, or rather destroyers, of infection in all cases, whether arising from the noxious effluvia of marshes, or from the contagion of diseased bodies. Even those most extraordinary and fatal damps called *barmatians*, formerly mentioned, are unable to resist the salutary effects of smoke. In other cases, our author remarks, that, under some circumstances, the source of an infection in a sick chamber or any other place, may be removed or destroyed by accidental means, for which we cannot account, and which we often cannot ascertain. But it oftener happens, that it is very difficultly rooted out; and that exact cleanliness, with the benefit of a pure air, often proves insufficient to remove the evil. Smoke, however, hath never been known to fail. It is not to be doubted, but that, excepting the true plague, there has been an infection fully as pestilential and as mortal in some ships, as in any other place whatever; yet it hath never been heard, that any ship, after having been carefully smoked, did not immediately become healthy: and if afterwards they turned sickly, it was easy to trace that sickness from other infected ships, jails, and the like places.

There are three methods practised for purifying vessels after the men have been removed out of them. The first is by burning of tobacco. A quantity of tobacco is spread on several fires, made with such old pieces of rope as are called *junk*. These are dispersed into different places of the ship, and their heat and smoke afterwards closely confined below for a considerable time.—The second method is by charcoal fires strewed with brimstone. The heat and steam of these burning materials must also be long and close shut up: but, although this fume, properly applied, hath been experienced to purify most effectually tainted apartments, ships, clothes, &c. yet there are some kinds of vermin which it will not destroy, particularly lice.—The third method of purification is performed by the addition of arsenic to the materials of the second process, in the following manner. After carefully stopping up all the openings, and every small crevice of the ship, (as was also necessary in the preceding processes) a number of iron pots, properly secured, are to be placed in the *hold, orlop, gun-deck*, &c. Each of these are to contain a layer of charcoal at the bottom, then a layer of brimstone, and so alternately three or four layers of each, upon which the arsenic is to be sprinkled, and on the top of it some oakum dipped in tar is to be laid to serve as a match. The men, upon setting fire to the oakum, must speedily leave the place, shutting close the hatchway by which they came up.

From the known and experienced efficacy of these processes, it appears, that fire and smoke are the most powerful agents for annihilating infection; and, it may be presumed, even the plague itself. This is in some measure agreeable to what we learn from the ancient records of physic. But the preposterous use, or rather abuse, of fire on such occasions, has caused its effects to be disregarded by some, and to be suspected of mischief by others. The modern practice of burning large fires in the open air, in the streets, and about the walls of towns infected with the plague or other contagion, is founded on principles groundless and erroneous; and hath, therefore, been experienced not only unsuccessful, but hurtful. But though this must be allowed, it doth not thence by any means follow, that when once a house hath been infected and the patients removed from it, the doors and windows at the same time being shut, that such fires will then prove hurtful; or that, by this method of purification, all the seeds of contagion will not be effectually destroyed. Whenever, therefore, persons die of a spotted fever, a malignant sore throat, the small-pox, or any distemper found to be communicable from the sick to others, the corpse ought quickly after death to be removed into another room; that in which the person died should be well aired, by having the windows opened, till a charcoal-fire be kindled, with some rolls of sulphur upon it; after which, both doors and windows should be kept shut for a considerable time, not less than eight or ten hours, till the room be thoroughly smoked. In several ships, where there are the fairest opportunities of trying and judging things of this nature, the contagion of the small-pox has been entirely stopped by wood-fires, sprinkled with brimstone, kept burning and closely confined in the infected place. In a word, a judicious and proper application of fire and smoke is the best means for the destruction and utter extinction of

the most malignant sources of disease; and they are besides the greatest purifiers of all bad and tainted air.

Next to the smoke of wood for purifying a tainted air, that of gun-powder is to be esteemed the best; and hath this further good property, that it is entirely inoffensive to the lungs. The cascarilla-bark, when burning, gives a most agreeable scent to the chamber of the sick; so is at least an elegant preservative, and may prevent bad smells from taking effect. The steam of camphorated vinegar warmed, is still more powerful for this purpose. But, besides correcting the ill quality of the air, and purifying the chamber, another good effect is produced from such steams and smoke as are inoffensive to the lungs. As soon as the vapour becomes dense, the nurses and patients become desirous of the admission of fresh air by the door or windows. Now it is certain, that the air in the chambers of the sick cannot be too often changed, provided the patient be well covered, and the curtains of his bed, if necessary, be drawn close. No argument is so forcible to obviate the danger of foul air in a room or ward, (occasioned by the obliquity of nurses or relations), as ordering it to be frequently fumigated or smoked: A practice more frequent in other countries than in this, but of great benefit to the sick.

Lastly, with regard to the method of purifying goods, moveables, clothes, &c. which are supposed to harbour infection, it must be observed, that the usual custom of only unpacking and exposing such materials to the open air, is in many instances insufficient to destroy the latent seeds of disease. It is certain indeed, that in most cases the contagious particles are more readily and fatally communicated from the clothes of a sick person, than from his body. The spreading abroad, therefore, of contaminated clothes to dry or to be aired, without a previous fumigation of them, may be of dangerous and fatal consequence. All such suspected substances should be first fumigated in a close place, and in the same manner as an infected chamber, after which they may be spread abroad and exposed to the air. In infectious diseases, especially fevers, the linen of the sick, or such clothes about them as will admit of being washed, ought never at first to be put in warm water, as it is dangerous to receive the steam that may hence arise. It is necessary to keep them first either in cold water, or in cold soap-lees, for several hours, that the filth may be washed off.

We must now proceed to give an account of the method of cure, after these methods of preventing the infection from being received into the body have either been neglected or proved ineffectual. Here it is of the utmost importance to take the disease in the very beginning, before it hath time to corrupt the fluids to such a degree as to endanger life. In these slight degrees of infection, a vomit properly administered, especially if succeeded by a blister, never fails to remove the disorder, and prevent the fever which would otherwise unavoidably follow. Of this Dr Lind gives the following instances. A lady afflicted with the bilious cholick, had intolerably fetid discharges of corrupted matters upwards and downwards. A gentlewoman, only in passing the room, was immediately seized with a retching and sickness, which continued 24 hours. The nurse who attended, was suddenly seized with a giddiness and vomiting from the bad smell,

which, as she expressed it, reached into her stomach. The vomiting became more severe at night, accompanied with a purging and frequent shiverings. By means of an emetic both evacuations were stopped: notwithstanding which, for some days afterwards, she continued to have frequent tremors, and a violent head-ach, with a low irregular pulse; and did not recover so soon as the patient.

Such slight degrees of infection have been often observed to be derived from patients of a gross habit of body, when labouring under inflammatory distempers, and even other complaints. A man was sent to Hafflar Hospital, supposed to have a fever. He was furiously delirious, with a quick full pulse. Notwithstanding plentiful evacuations, this delirium continued for two months with short intervals; when the case was found to be plainly *maniacal*. A nurse, upon raising this person up in her arms, perceived an intolerably bad smell, and was instantly seized with shiverings, sickness, and head-ach. Finding herself very ill, she took a vomit in six hours afterwards, and passed the night in profuse sweats by means of a sudorific draught. Next morning the violence of the head-ach was but little abated; upon every attempt to move, she complained of a burning heat and pain in her forehead, and became giddy. Her inclination to drink was frequent, and her pulse low and quick. A blister was immediately applied to the back: as soon as the blister took effect, the head-ach and thirst entirely left her, and the pulse was calm. Next day she arose and was well.

Many similar instances of infection have been observed from putting the dead into their coffins. In particular, one man, who, from performing that duty to his messmate, was so ill, even after the operation of the vomit, as to require a blister. In the course of one week two nurses were infected by a person in the small-pox. Both were seized in like manner with shiverings, sickness, and head-ach; the one upon receiving the patient's breath, the other upon making his bed. In one, a pain darted into her breast; in the other, into the breast and in the small of the back. The complaints of the former were speedily removed by a vomit, though she continued to have irregular returns of shiverings for three days afterwards. But in the latter, though the head-ach, sickness, and rigors, were greatly abated by the vomit, yet a constant heat and thirst, with a low pulse, and a violent pain in the breast, indicated the necessity of applying a blister to the affected parts which next morning removed all her complaints.

A person is often immediately sensible of his having received an infection from the first attack: they generally compare the first impression to an earthy, disagreeable smell, reaching down, as they express it, into their stomach, as from a grave newly opened, but not quite so raw as the cadaverous stench; and the effects of it, shivering and sickness, are instantaneous. It is a smell difficult to describe; but is well known to the nurses and attendants about the sick, as it usually accompanies fevers of extreme malignity, and, with the peculiar discharges from the blistered parts, may be reckoned among the most constant symptoms of a bad fever. Some compare the smell to that of rotten straw. It often resembles the disagreeable smell of a person labouring



labouring under the confluent small-pox at their turn, though not so strong. One person, on receiving the infection, was sensible of something like an electric shock through his body. But many are not sensible of any effect from an infection at first; and an infection from a fever will sometimes continue for many days, nay weeks, discovering itself chiefly by irregular shiverings, sometimes so severe as to oblige the patients to have recourse to their beds once or twice a-day; sometimes every other day. Among a number thus affected, it also appears, that such as are put into unseasoned chambers, or have sat down on the cold ground, lain in raw damp apartments, &c. are immediately seized with a sickness at stomach, sometimes with a dangerous purging, and often with fevers accompanied with bad symptoms, which others have entirely escaped.

It now remains to consider the proper method of curing putrid fevers, on the supposition that the infection hath been allowed to operate till the blood becomes radically tainted, and of consequence the nervous system affected to such a degree, that its power cannot be restored by any of the simple medicines above-mentioned. Here all authors agree, that a change of air, when it can be effected, is absolutely necessary, and often contributes more towards the removing of the disease than all the medicines that can be exhibited. The utility of this change will appear from what hath been formerly said; and we shall only further allege one instance from Dr Lind, in which the effects of bad air appear to a degree almost incredible. "It is remarkable," (says he), that in the last war, the English ships which touched at Batavia suffered more by the malignant and fatal diseases of that climate, than they did in any other part of India, if we except a fatal scurvy which once raged in that fleet at sea. Soon after the capture of Manila, the Falmouth, a ship of 50 guns, went to Batavia, where she remained from the latter end of July to the latter end of January; during which time she buried 100 soldiers of the 79th regiment, and 75 of the ships company; not one person in the ship having escaped a fit of sickness, except her commander Captain Brereton. The Panther, a ship of 60 guns, was there in the years 1762 and 1764; and both times during the rainy season. In the former of these years, she buried 70 of her men; and 92 of them were very ill when she left the place. In the year 1764, during a short stay, 25 of her men died. The Medway, which was in company with her, lost also a great number of men. Nor was the sickness at that time confined to the ships; the whole city afforded a scene of disease and death: streets crowded with funerals, bells tolling from morning to night, and horses jaded with dragging the dead in heaves to their graves. At that time a slight cut of the skin, the least scratch of a nail, or the most inconsiderable wound, turned quickly to a spreading putrid ulcer, which in 24 hours consumed the flesh even to the bone. This fact is so extraordinary, that, upon a single testimony, credit would hardly be given to it; yet on board the Medway and Panther they had the most fatal experience of it, and suffered much from it."

But where this change of air is impracticable or ineffectual, and where the fever hath already made some progress, Sir John Pringle generally took away some blood if the pulse was full. When the symptoms run

high, a plentiful evacuation of that kind seemed indicated; yet it was observed that large bleedings generally did harm, by sinking the pulse, and affecting the head. Nor was a moderate bleeding to be repeated without caution; even those whose blood was sizy, unless their lungs were inflamed, were the worse for a second bleeding. If the head only suffered, it was much safer to use leeches than to open a vein in the arm; but in the delirium with a sunk pulse, even leeches were hurtful. Many recovered without letting blood, but few who lost much of it.

Vomits also must be used with caution; for though they may be of use by way of prevention, yet in the advanced state of the disease, when the patient has all along complained of a sickness at stomach, they are evidently unsafe. Here the antiseptic quality of fixed air is of much use, and the neutral draughts given in the act of effervescence are generally attended with happy effects. Nay, clysters of fixed air itself have been found very serviceable. Even in very bad stages of the distemper, where a putrid and colliquative looseness hath taken place, clysters of fixed air have been known to alleviate the symptoms. We must not, however, put too much confidence in medicines of this kind. Mild astringent cordials, especially the wine and Peruvian bark, are the only resources in these disorders. Concerning the former, Sir John Pringle observes, in the low state of these fevers, and in great sinkings, which either come after unseasonable bleedings, or long want of nourishment, it was a most grateful and efficacious cordial, to which nothing was comparable. The common men had an allowance, from a quarter to half a pint in a day, of a strong kind, made into whey, or added to the panada which was their ordinary food. But to others out of the hospital, he usually prescribed Rhenish, or a small French wine, whereof some consumed near a quart per day, and part of that undiluted. Nay, so great was the virtue of wine in this stage of the fever, that several were known to recover from the lowest condition, when, refusing the bark on account of its taste, they took nothing but a little panada with wine and a volatile diaphoretic mixture every two or three hours by turns. Perhaps there is no rule more necessary in this state, than not to let the patient when low remain long without taking something cordial and nourishing; as many have been observed past recovery, by being suffered to pass a whole night without any support about the time of the crisis. In the advanced state of this fever the sick are remarkably low; and therefore Hoffman advises in such cases, that they should be constantly kept in bed, and not permitted even to sit up in it. In the last stage of this fever, as well as in that of the sea-scurvy, it would seem that the force of the heart was too small to convey the blood to the brain, except when the body is in an horizontal posture.

But, however necessary wine and the bark may be in the low stage of this fever, we must remember, that these remedies are to be administered only as antiseptics and supporters of the *vis vite*, without aiming at thoroughly raising the pulse or relieving the head, or at forcing a sweat by them before nature points that way, and which Sir John Pringle seldom observed before the 14th day. For though the patient may die before that time if he has been largely bled, or if the

cordial

cordial medicines have been given him too freely, yet such means as our author made use of were not powerful enough to bring on a crisis sooner.

In the low state of the hospital-fever, a stupor was a constant attendant, which was very apt, in the evening, to change to a slight delirium. If this was all, as being in the common course, nothing was done. But if the delirium increased upon using wine, if the eyes looked wild or the voice became quick, there was reason to apprehend a phrenitis; and accordingly it was observed, that at such times all internal heating medicines aggravated the symptoms; and in these cases blisters were of the greatest service. Fomentations of vinegar and warm water for the feet, our author is of opinion, would answer better than either sinapisms or blisters, provided they were long enough and often enough applied. In the inflammatory fevers, he has known these fomentations have little effect for the first hour, and yet succeed afterwards. For internal medicine, the bark was omitted for some time, but the patient was continued with an acidulated drink, viz. barley-water and vinegar; and treated also with camphire, *pulvis contrayerva compositus*, and nitre, as was usual in the beginning of the fever. If the delirium was of the low kind, a decoction of the bark and wine were the only remedies; for in no instance was the delirium perfectly removed till the time of the crisis. It must also be observed, that a delirium may arise in putrid fevers from two opposite errors; one from large and repeated bleedings, and the other from wine and the cordial medicines being taken too early. It appears therefore how nice the principles are that regard the cure; as neither a hot nor a cool regimen will answer with every patient, or in every state of the disease.

If a diarrhoea came on in the decline of the fever, it was moderated, but not suppressed, by adding an opiate to the usual medicines. For though the looseness may be considered as critical; yet as the sick were too low to bear evacuations, there was a necessity for restraining it in some measure; and it has often been observed, that when it has been treated in this manner, about the usual time of the crisis, the patient has fallen into a gentle sweat, which has carried off the disease. In the worst cases of this fever, and especially when it coincides with the dysentery, the stools are frequently bloody; in which dangerous state, if any thing could be done, it was attempted by medicines of the same kind. In proportion to the putrid nature of the stools, opiates and astringents were used with the greater caution.

If the disease terminated in a suppuration upon one of the parotid glands (for the gland itself does not suppurate), the abscess was opened without waiting for a fluctuation, which might never happen; the pus being often here so viscid, that after it was ripe the part felt nearly as hard as if the suppuration had not begun.

Almost every patient, after the fever, complained of want of rest, frequently of a vertigo or confusion of the head, of a continuation of the deafness, or of other symptoms commonly called *neurosis*. An opiate was then given at night; and in the day some strengthening medicines, such as the bark and the *elixir of vitriol*. In these cases, the bark was found

not only to be the best strengthener, but the surest preservative against a return of the disease. For this last intention the convalescent was ordered about three drachms a-day for six or seven days together; and afterwards, if he remained longer in the hospital, some smaller quantity daily. But if there was any appearance of a hectic fever from an inward abscess, the case was treated accordingly. Upon comparing some of the remaining symptoms of those who recovered, with the condition of the brain in those who died and were opened, our author was induced to think, that some part even of that substance might suppurate; and yet the person recover.

Sometimes the patient falls into an irregular intermittent; which, if not of a hectic nature from an internal abscess, may proceed from neglecting to clear the *prime vie*. For it is easy to conceive, that after a long fever of such a putrid nature, often attended with languor of the bowels, the fæces may be so much accumulated, and so corrupted, as to occasion new disorders. In such cases, after proper evacuation by a purge, the bark was almost an infallible remedy.

### XXVIII. The Yellow Fever. Sp. II.

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Typhus iteroides, *Sauv. p. 7.*

*Febris flavæ Indiæ Occidentalis*, Warren. Malignant fever of Barbadoes, *Hillary's Diseases of Barbadoes*. *Lining on the yellow fever of South Carolina*, Edin. phys. and liter. Essays, vol. ii. *Mackittrick de febre flavâ Indiæ Occidentalis*, Edin. 1766.

*Description.* This is one of the most fatal diseases to which the inhabitants of warm climates are subject, and is the same with that called, from one of its worst symptoms, the *black vomit*, which is so terribly destructive in some of the warm parts of America, particularly at Carthage. According to Dr Hillary, the yellow or putrid bilious fever most commonly seizes the patient at first with a faintness, then a sickness at stomach, accompanied mostly with a giddiness of the head; soon after with a slight chilliness and horror, very rarely with a rigor, which is soon followed by a violent heat and high fever, attended with acute darting pains in the head and back. A flushing in the face, with an inflamed redness and a burning heat in the eyes, great anxiety and oppression about the præcordia, are the pathognomic signs of the distemper; especially when attended with sickness at stomach, violent retchings, bilious yellow vomitings, with frequent sighing. The pulse is now generally very quick, high, soft, and sometimes throbbing, but never hard: in some it is very quick, soft, low, and oppressed; the respiration quick, full, and sometimes difficult; the skin very hot, and sometimes dry, though more frequently moist. Blood taken from the patient, even at the very beginning of the disease, is often of an exceeding florid red colour; much rarefied and thin, and without the least appearance of fize; and the crassamentum, when it has stood till it is cold, will scarce cohere, but fluctuates; the serum is very yellow.

Most of the abovementioned symptoms continually increase, and are much aggravated: the retching and vomiting become almost incessant; the anxiety great, and sighing frequent; great restlessness; continual tossing; no ease in any posture; little sleep, and that disturb.

erics disturbed and uneasy, and without any refreshment to the sick : and when they are fainting, they turn yellow about the face and neck, instead of turning pale ; and as the fainting goes off, they recover their natural colour. These symptoms generally continue to the third day, though sometimes not longer than the first or second, in others to the end of the fourth : the first shews the greater dissolution of the blood, and the greater malignity of the disease; the last, the contrary; which the improper manner of treating the disease sometimes hastens and increases, or the proper method retards. This may be called the first stadium of the disease, and generally ends on the third day.

Blood taken from the sick on the second or third day, is much more dissolved, the serum more yellow, and the crassamentum florid, loose, scarce cohering, but undulates like fizy water when shaken, and sometimes has dark blackish spots on its surface, shewing a strong gangrenæfcent diathesis.

About the third day, the pulse, which was quick and full before, now generally sinks greatly, and becomes very low : though sometimes it remains very quick, yet in others it is not much quicker than when the patient is in health, but is always low ; the vomiting becomes almost incessant if not so before, and the matter thrown up is black ; the patient then becomes comatose, with interrupted deliria. The thirst in some is very great, in others but little ; the pulse still low and quick, attended with cold clammy sweats, and sometimes with deliquia. The eyes, which were inflamed and red before, and began to be of a more duskyish colour, now turn yellow ; and this yellowness also soon after appears round the mouth, eyes, temples, and neck, and in a short time diffuses itself all over the body. But this yellowness is so far from being always an encouraging prognostic, as some would have it, that it most commonly proves a mortal symptom. Sometimes indeed, though seldom, this suffusion of bile upon the surface has proved critical : but then it did not come on till the eighth or ninth day, nor appear till the coma and all the other bad symptoms began to abate; and then in proportion as the yellowness increases, all the bad symptoms decrease. But the case is most commonly quite the reverse; especially when the yellowness comes soon on : and then it is not only symptomatical, but ushers in the most fatal symptoms of the disease, viz. a deep coma, a low, vermicular, and intermitting pulse, great hæmorrhages from various parts of the body, a delirium with laborious and interrupted respiration, great anxiety, deep sighing, restlessness, a subfultus tendinum, coldness of the extreme parts first, and then all over the body, a faltering of the speech, tremors, and convulsions, which are soon after followed by death. So that from the first appearance of the yellowness we may say the patient is in the last stage of the disease, whether it terminates in death or recovery.

It has been observed, that, in some strong sanguine constitutions, when the patients have not been bled to a sufficient quantity in the beginning of the disease, the pulse has continued full, strong, and rapid, but never hard ; the face flushed, eyes inflamed ; the tongue dry, with great thirst and heat, till the second or last stage of the fever is come on, when the pulse has suddenly sunk, and death soon after ensued. Yet in

others, who seemed to be of a plethoric habit, the tongue has been moist all along, though they have been delirious most of the time, and the heat of their skin and the strength and quickness of their pulse have continued, after the first stage of the disease was over, pretty near to that of their natural state in health, till within a few hours of their death ; and when they have had a coma on them, one who is not well acquainted with the nature of this disease would, from their pulse, heat, breathing, and other symptoms, have taken them to be in a natural sleep. Others, when the pulse has begun to sink, and the fatal period seemed to be just approaching, to the great surprize of all present have recovered their senses, sat up, and talked pretty cheerfully for an hour or two, and in the midst of this seeming security have been suddenly seized with convulsions, which carried them off immediately.

In the latter stage of this fever, the blood is so attenuated and dissolved, that we frequently see it flowing not only out of the nose and mouth, but from the eyes, and even through the pores of the skin ; also great quantities of black, half-baked, or half-mortified blood, are frequently voided both by vomiting and by stool, with great quantities of yellow and blackish putrid bile by the same ways ; and the urine, which was before of a high icteritious colour, is now almost black, and is frequently mixed with a considerable quantity of half-dissolved blood. The pulse, which was much sunk before, now becomes very low, unequal, and intermitting ; the breathing difficult and laborious ; and the anxiety inexpressible : an oppression with a burning heat about the præcordia comes on, tho' the extremities are cold, and often covered with cold clammy sweats : a constant delirium follows ; and then a total loss of the outward senses as well as the judgment, with livid spots in many parts of the body, especially about the præcordia ; and sometimes gangrenes in other parts of the body, which are very soon succeeded by death.

In a short time after death, the body appears much more full of livid, large, mortified spots, particularly about the præcordia and hypochondres, especially the right ; which parts seem, even from the first seizure, to be the principal seat of this terrible disease ; and, upon opening the bodies of those who die of it, we generally find the gall-bladder and biliary ducts turged, and filled with a putrid blackish bile ; and the liver, stomach, and adjoining parts, full of livid or blackish mortified spots ; and the whole corpse soon putrifies after death, and can be kept but a few hours above ground.

Dr Lind is of opinion, that the remarkable dissolution of the blood, the violent hæmorrhages, black vomit, and the other symptoms which characterize the yellow fever, are only accidental appearances in the common fever of the West-Indies ; that they are to be esteemed merely as adventitious, in the same manner as purple spots and bloody urine are in the small-pox, or as an hiccup in the dysentery : like these they only appear when the disease is attended with a high degree of malignity, and therefore always indicate great danger. This opinion he thinks is confirmed by an observation of Dr Wind's, that in 1750 the crew of a Dutch ship of war were distressed by the yellow fever,



**PRACTICE** fever, accompanied with the black vomit; but when the ship left the harbour, and changed the noxious land-air for one more healthy, the fever continued, but was not accompanied with the black vomit.

Diseases similar to this fever, our author informs us, may arise in any part of the world where the air is intensely hot and unwholesome; and therefore he treats as chimerical the notion of its being imported from one part of the world to another. An example of this happened at Cadiz in Spain, in the months of September and October 1764, when excessive heat, and want of rain for some months, gave rise to violent, epidemic, bilious disorders, resembling those of the West-Indies, of which 100 persons often died in a day. At this time the winds blew mostly from the south, and after sunset there fell an unusual and very heavy dew.

This disease began commonly with alternate slight chills and heats, nausea, pains of the head, back, loins, and at the pit of the stomach. These symptoms were often followed, in less than 24 hours, with violent retchings, and vomiting of a green or yellow bile, the smell of which was very offensive. Some threw up an humour as black as ink, and died soon after in violent convulsions and in a cold sweat. The pulse was sometimes sunk, sometimes quick, but often varying. After the first day, the surface of the body was generally either cold, or dry and parched. The head-ach and stupor often ended in a furious delirium, which quickly proved fatal. The dead bodies having been examined by order of the court of Madrid, the stomach, mesentery, and intestines, were found covered with gangrenous spots. The orifice of the stomach appeared to have been greatly affected, the spots upon it being ulcerated. The liver and lungs seemed to be putrid, both from their texture and colour. The stomach contained a quantity of an atrabilious liquor, which, when poured on the ground, produced a sensible effervescence; and, when mixed with spirit of vitriol, a violent ebullition ensued. The dead bodies so quickly turned putrid, that at the end of six hours their stench was intolerable; and, in some of them, worms were found already lodged in the stomach. His majesty's ship the *Tweed* being at that time in Cadiz bay, several of her men were taken ill when on shore, but by being carried on board all of them recovered. Neither did the black vomit, or any other deadly symptom of that fever, make its appearance in any of the ships.

It hath been a matter of much dispute, whether the yellow fever is of an infectious nature or not. Not long ago it became an object of consideration before the Right Hon. the Lords Commissioners of Trade and Plantations, where it was urged, among other reasons, for not removing the seat of government and justice in the island of Jamaica from Spanish Town to Kingston, that there was danger from Greenwich hospital, situated near Kingston, of an infection from the yellow fever being frequently communicated to that town. On this affair a physician was consulted, who had long practised in that island, and who gave it as his opinion, that from the yellow fever in that island there was no infection. This was the opinion not only of that gentleman, but of many others who had an opportunity of being well acquainted with this fever in

Jamaica. Nevertheless Dr Lind gives a remarkable instance of its being of an infectious nature.—A gentleman dying at Barbadoes of a yellow fever, his wearing apparel and linen, packed up in a chest, were sent to his friends at Philadelphia; where, upon opening the chest, the family was taken ill; and the clothes being unluckily hung abroad to be aired, they presently diffused the contagion of the yellow fever over the whole town, by which 200 persons died. These contradictions, Dr Lind thinks, can only be reconciled by supposing the yellow fever in the West-Indies to be sometimes of an infectious nature, and sometimes not.

In the description of the same fever, as it appears in South-Carolina, by Dr Lining, there are several particulars considerably different from that by Dr Hillary. According to the former, people complained, for a day or two before the attack, of a head-ach, pain in the loins and extremities, especially in the knees and calves of the legs, loss of appetite, debility, and a spontaneous lassitude. Some, however, were seized suddenly, without any such previous symptoms. After a chilliness and horror with which this disease generally invades, a fever succeeded. The pulse was very frequent, till near the termination of the fever, and was generally full, hard, and consequently strong: in some, it was small and hard; in others, soft and small; but in all those cases, it frequently varied in its fullness and hardness. Towards the termination of the fever, the pulse became smaller, harder, and less frequent. In some there was a remarkable throbbing in the carotids and in the hypochondria; in the latter of which it was sometimes so great, that it caused a constant tremulous motion of the abdomen. The heat generally did not exceed 102 degrees of Fahrenheit's thermometer; in some it was less; it varied frequently, and was commonly nearly equal in all parts, the heat about the præcordia being seldom more intense than in the extremities when these were kept covered. In the first day of the disease, some had frequent returns of a sense of chilliness, though there was not any abatement of their heat. In a few, there happened to great a remission of the heat for some hours, when at the same time the pulse was soft and less frequent, and the skin moist, that one from these circumstances might reasonably have hoped that the fever would only prove a remittent or intermittent. About the end of the second day, the heat began to abate. The skin was sometimes (though rarely) dry; but oftener, and indeed generally, it was moist, and disposed to sweat. On the first day, the sweating was commonly profuse and general; on the second day, it was more moderate: but on both these, there happened frequent and short remissions of the sweatings; at which times the febrile heat increased, and the patient became more uneasy. On the third day, the disposition to sweat was so much abated, that the skin was generally dry; only the forehead and backs of the hands continued moist. The respiration was by no means frequent or difficult; but was soon accelerated by motion, or the fatigue of drinking a cup of any liquid. The tongue was moist, rough, and white, even to its tip and edges. On the second day, its middle in some was brown. On the third day, the whiteness and roughness of the tongue began to abate. The thirst in very few was great,

great. A nausea, vomiting, or frequent retchings to vomit, especially after the exhibition of either medicines or food, came on generally the third day, as the fever began to lessen; or rather as the fulness of the pulse, heat, and disposition to sweat, began to abate. Some indeed, but very few, on the first day, had a vomiting, either bilious or phlegmatic. Very few complained of anxiety or oppression about the præcordia or hypochondria, nor was there any tension or hardness about the latter. On the first day they generally dozed much, but were afterwards very watchful. Restlessness and almost continual jactations came on the second day. A great despondency attended the sick, and the strength was greatly prostrated from the first attack. The pain in the head, loins, &c. of which they had complained before the attack, were greatly increased, and in some the pain in the forehead was very acute and darting; but those pains went generally off the second day. The face was flushed; and the eyes were hot, inflamed, and unable to bear much light. On the first day, many of them at times were a little delirious, but afterwards not until the recess of the fever. The blood saved at venesection had not any inflammatory crust; in warm weather, it was florid like arterial blood, and continued in one soft homogeneous-like mass, without any separation of the serum after it was cold. When there was any separation, the crassamentum was of too lax a texture. The stools, after the first day, were fetid, inclined to a black colour, and were very rarely bilious, soft, or liquid, excepting when forced by art; for an obstinate costiveness attended the febrile state. The urine was discharged in a large quantity, was pale, sometimes limpid, and rarely of a higher than a straw colour, except when the weather was very warm, and then it was more saturated, of a deep colour, and discharged in smaller quantities. It had a large cloud, except when it was very pale or limpid; but more generally it had a copious white sediment, even on the first day of the fever. On the second day, the urine continued to be discharged very copiously; in some, it was then turbid, and deposited a more copious sediment than on the first day: this sediment was sometimes of a brownish colour; in which case it was generally followed by bloody urine, either about the end of the second or beginning of the third day. The colour and quantity of the urine, discharged in equal times, were remarkably variable, being now limpid, then of a deeper colour, now discharged in a larger, then in a smaller quantity; which could not be ascribed to any change made either in the quantity or quality of the drink, &c.

The fever accompanied with those symptoms terminated on the third day, or generally in less than 72

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hours from the first attack, not by any assimilation or coction and excretion of the morbid matter: for if by the latter, there would have been some critical discharge by sweat, urine, stool, or otherwise, none of which happened; and if by the former, nothing then would have remained but great debility. This fever, however, did not terminate in either of these salutary ways, excepting in some, who were happy enough to have the disease conquered in the beginning by proper evacuations, and by keeping up a plentiful sweat, till the total solution of the fever, by proper mild diaphoretics and diluents. But those who had not that good fortune, however tranquil things might appear at this period, (as great debility, and a little yellowness in the white of the eyes, seemed then to be the chief complaint, excepting when the vomiting continued,) yet the face of affairs was quickly changed: for this period was soon succeeded by the second *stadium*; a state, though without any fever, much more terrible than the first: the symptoms in which were the following. The pulse, immediately after the recess of the fever, was very little more frequent than in health, but hard and small. However, though it continued small, it became, soon afterwards, slower and very soft; and this softness of the pulse remained as long as the pulse could be felt. In many, in this stage of the disease, the pulse gradually subsided, until it became scarce perceptible; and this, notwithstanding all the means used to support and fill it; and when this was the case, the icteritious-like suffusion, the vomiting, delirium, restlessness, &c. increased to a great degree. In some, the pulse, after being exceedingly small and scarce perceptible, recovered considerably its fullness; but that favourable appearance was generally of but short continuance. The heat did not exceed the natural animal-heat; and when the pulse subsided, the skin became cold, and the face, breast and extremities acquired somewhat of a livid colour. The skin was dry when the weather was cold, but was moist and clammy when the weather was hot. The respiration was natural, or rather slow. The tongue was moist, and much cleaner than in the former stage; its tip and edges, as also the gums and lips, were of a more florid red colour than usual. Very few complained of thirst, though they had a great desire for cold liquors. The vomiting or reaching to vomit increased, and in some was so constant that neither medicines nor aliment of any kind were retained. Some vomited blood; others only what was last exhibited, mixed with phlegm; and others again had what is called the *black vomit* (A). The reaching to vomit continued a longer or shorter time according to the state of the pulse; for as that became fuller, and the heat greater, the reaching to vomit abated, and

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è contra.

(A) That which is called the *black vomit*, at first sight appears to be black; but on a more careful examination, it was observed that this colour proceeded from a great quantity of small flakey black substances which floated in the liquor thrown up by vomit; but the colour of this liquor was much the same with that which the patient had last drank, and was by no means black. Those black flakey substances are the bile mixed with, or adhering to, the mucus which lined the stomach. For, upon dissection of those who died of this disease, it was always observed that the mucus of the stomach was abraded, and the bile in its egress was black and sometimes very viscid. In a lad who died of this disease in the beginning of the fourth day, and who was immediately opened, the bile was not only black, but had the consistence of thick venice-turpentine, and was exceedingly tough. On the inside of the stomach, there were several carbuncles or gangrenous specks. And in all those who were dissected, and had died of this disease, the same appearances were not only always observed, but likewise the blood was very fluid, and the vessels of the viscera were much distended.

*et contra.* The iniquitude was very obstinate; and when they dozed, their slumbers were but short and unrefreshing. There were some who were drowsy; but these always awakened, after the shortest slumbers, with a great dejection of spirits and strength. The jactations or restlessness were surprising: it was frequently scarce possible to keep the patients in bed; though, at the same time, they did not complain of any anxiety or uneasiness; but if asked how they did, the reply was, *very well*. The debility was so great, that, if the patient was raised erect in the bed, or, in some, if the head was only raised from the pillow, while a cup of drink was given, the pulse sunk immediately, and became sometimes so small, that it could scarce be felt; at this time, they became cold, as in a horripilation, but without the aserine-like skin: their skin became clammy, the delirium increased, their lips and skin, especially about the neck, face and extremities, together with their nails, acquired a livid colour. The delirium returned and increased; it was generally constant in those whose pulse was small and subsiding. The inflammation of the tunica conjunctiva or white of the eyes increased much, but without pain. A yellowness in the white of the eyes, if it did not appear before in the febrile state, became now very observable, and that icteritious-like colour was soon diffused over the whole surface of the body, and was continually acquiring a deeper saffron-like colour. In some indeed no yellowness was observable, excepting in the white of the eyes, until a little before death, when it increased surprisingly quick, especially about the breast and neck. There were many small specks, not raised above the skin, which appeared very thick in the breast and neck, but less so in the extremities, and were of a scarlet, purple, or livid colour. In women the menstua flowed, and sometimes excessively, though not at their regular period.

There was such a putrid dissolution of the blood in this stadium of the disease, that, besides the vomiting of blood formerly mentioned, and the bloody urine soon to be taken notice of, there were hæmorrhages from the nose, mouth, ears, eyes, and from the parts which were blistered with cantharides. Nay, in the year 1739 or 1745, there was one or two instances of an hæmorrhage from the skin, without any apparent puncture or loss of any part of the scarf-skin.

An obstinate costiveness continued in some; in others, the stools were frequent and loose; in some, they were black, liquid, large, and greatly fatiguing; in others, when the stools were moderate, even tho' they were black, they gave great relief; in others, again, the stools nearly resembled tar in smoothness, tenacity, colour and consistence.

The urine was discharged in a large quantity, in proportion to the drink retained by the patient: it was pale if the patient was not yellow; but if yellow, then it was of a deep saffron-colour: in either case, it had a sediment, or at least a large cloud, which remained at the bottom of the glass; in some, it was very turbid; in others, it was bloody: and the quantity of blood discharged with the urine bore always some proportion to the state of the pulse; when that became fuller, the quantity of blood in the urine was

diminished; when the pulse subsided, the bloody urine increased, and even returned after it had ceased some days, soon after the pulse became smaller. This stage of the disease continued sometimes seven or eight days before the patient died.

When this stadium of the disease terminated in health, it was by a recess or abatement of the vomiting, hæmorrhages, delirium, inquietude, jactations, and icteritious-like suffusion of the skin and white of the eyes; while, at the same time, the pulse became fuller, and the patient gained strength, which, after this disease, was very slowly. But when it terminated in death, those symptoms not only continued, but sooner or later increased in violence, and were succeeded with the following, which may be termed the third *stadium* of the disease, which quickly ended in death. The pulse, though soft, became exceedingly small and unequal; the extremities grew cold, clammy, and livid; the face and lips, in some, were flushed; in others, they were of a livid colour; the livid specks increased so fast, that in some the whole breast and neck appeared livid; the heart palpitated strongly; the heat about the præcordia increased much; the respiration became difficult, with frequent sighing; the patient now becomes anxious, and extremely restless; the sweat flowed from the face, neck, and breast; blood flowed from the mouth, or nose, or ears, and in some from all those parts at once; the deglutition became difficult; the hiccoughs and subfultus of the tendons came on, and were frequent; the patients trifled with their fingers, and picked the naps of the bed-clothes; they grew comatous, or were constantly delirious. In this terrible state, some continued eight, ten, or twelve hours before they died, even after they had been so long speechless, and without any perceptible pulsation of the arteries in the wrists; whereas, in all other acute diseases, after the pulse in the wrists ceases, death follows immediately. When the disease was very acute, violent convulsions seized the unhappy patient, and quickly brought this stadium to its fatal end. After death, the livid blotches increased fast, especially about the face, breast, and neck, and the putrefaction began very early, or rather increased very quickly.

This was the progress of this terrible disease thro' its several stadia. But in hot weather, and when the symptoms in the first stage were very violent, it passed thro' those stages with such precipitation, that there was but little opportunity of distinguishing its different stadia, the whole tragedy having been finished in less than 48 hours. It was remarkable, that, 1. The infection was increased by warm and lessened by cold weather. 2. The symptoms in the several stadia were more or less violent, according to the heat or coolness of the weather. In hot days, the symptoms were not only more violent, but in those who seemed, in moderate weather, to be on the recovery, or at least in no danger, the symptoms were all so greatly heightened, when the weather grew considerably warmer, as frequently to become fatal. In cool days, the symptoms were not only milder, but many, who were apparently in great danger in hot days, were saved from the very jaws of death by the weather becoming happily cooler. 3. The disease was generally more fatal to those who



lay in small chambers not conveniently situated for the admission of fresh air, to those of an athletic and full habit, to strangers who were natives of a cold climate, to those who had the greatest dread of it, and to those who before the attack of the disease had overheated themselves by exercise in the sun, or by excessive drinking of strong liquors; either of which indeed seemed to render the body more susceptible of the infection. Lastly, the disease proved most certainly fatal to valetudinarians, or to those who had been weakened by any previous disease.

*Causes of, and persons subject to, this disease.* The yellow fever attacks only Europeans, especially those who have but lately arrived in the hot climates. Negroes are entirely exempt from it, though the mulattoes and tawnies are as liable to be seized with it as the whites themselves. The cause of the disease seems to be a particular kind of contagion; but Dr Lind seems to be of opinion, that the immediate cause of the symptoms is a disposition in the glutinous part of the blood to separate from the others, and to become purulent. In some persons who have been bled in the yellow fever, the blood hath been observed prodigiously viscid; the crassamentum covered with a yellow gluten half an inch in thickness, and impenetrable to the finger unless cut by the nail; the serum being at the same time of the consistence of a thin syrup, and of a deep yellow tinge. This serum tasted bitter, and was taken for a composition of foot. The appearances on dissection, with his conclusions from them, we shall give in his own words: "In a man who died on the eleventh day of a yellow fever, whose body emitted no bad smell thirty-six hours after death, and was still yellow, I found all the bowels of the abdomen found; the liver and spleen were remarkably so; as also the stomach and intestines. There was no suffusion of the bile either in the intestines or stomach. The gall-bladder, of the natural size, contained the usual quantity of bile, somewhat thicker than common, and grumous [B]."

"Upon examining further, his disease was found to have lain wholly on the left side, where, within the breast, was found near a quart of yellowish water, in which were many large flakes of yellowish gluten, appearing, by comparison, precisely the same with the thick pellicle which had covered the blood taken from his arm. These flakes bore in several places a resemblance to a membranous substance beginning to be converted into a purulent jelly. The pleura, both on its inside and outside, as also its continuation, the investing membrane of the lungs, (which in some parts was greatly thickened), were covered with cakes of this gluten, hanging in some places loosely, in others adhering more strongly; and all in different states of yellow or purulent corruption. The right cavity of the breast, and all the other parts of his body, were found entirely free from disease.

"His complaints had been chiefly in his breast; and a small quantity of blood, taken from him two days before his death, was covered with an impenetrable, yellow, thick gluten; the red portion below it being quite loose.

"In those fevers, I have also seen the disease entirely confined to the heart and pericardium. In one who died the tenth day of the fever, without having been yellow, a quantity of pus and purulent crusts were found mixed with the water of the pericardium. The heart in different places was excoriated, and, together with the inside of the pericardium, was lined with a thick membranous cake, similar to that already mentioned on the lungs and pleura. In some places, this cake had a purulent, in others a gelatinous appearance, exactly resembling the coagulum of the blood. His complaints had been, a great oppression on the breast, and an extreme difficulty of breathing. In a third person, who died on the thirteenth day of the fever, above two quarts of pus and purulent jelly were found in the cavity of the belly. The source of such an extraordinary quantity of matter was not from any preceding inflammation, nor any imposthume, that we could discover; but from innumerable ulcerations on the surface of the intestines, omentum, mesentery, and peritonæum. Neither did those ulcerations (or excoriations, as they rather appeared in several places) seem to be the primary fountains of the matter, but to have been occasioned by its acrimony.

This purulent appearance seems to arise merely from an extravasation of one of the component parts of the blood, the gluten or coagulable lymph, blood taken from persons in a fever, and frequently even from persons in perfect health, after standing in a clean vessel for a short time, commonly separates into three distinct portions; viz. the serum, or water of the blood, the red concreted mass, and a viscid pellicle termed the *fize*, which spreads itself on the top of the red concretion. Some time ago, when making experiments with the blood taken from persons in the fever, I was surprised to find it often covered with that fizy crust. This induced me to extend my experiments to large quantities of blood from different subjects, which I had opportunities of inspecting at once in so large an hospital. For this purpose I one morning ordered ten patients in the fever to be bled, taking two ounces from each. A larger quantity was taken, for its inspection, from two men in health. That day I had occasion to prescribe bleeding to a woman in labour, two hours before her delivery; to a girl of sixteen years of age afflicted with a lunacy proceeding from the chlorosis; to three patients in the rheumatism; and to a person labouring under an obstruction of the liver.

"From a nice comparison, and an examination of the different blood, I found in general, that the more fize there was on the top, and the thicker and more viscid this white pellicle shewed itself, the concretion below it was of a more loose coherence. This was not so observable when only some slight white streaks appeared on the top. But when much fize had separated itself, the red mass became very soft at the bottom of the vessel, and less compact in its different parts, in proportion to their distance from the surface, towards which this whitish portion had ascended.

From this and from other experiments it appears, that

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(B) In others who died in this yellow state, the bile in the gall-bladder was found of a thick ropy consistence like pitch, but the liver never appeared in the least affected. Dr Lind at first, in several bodies, opened the head only; but afterwards judged that all the cavities ought to be inspected.

that this crust or pellicle is the natural gluten or cement of the blood, (called by some the *coagulable lymph*), which becomes strongly disposed, in certain circumstances and diseases, to separate itself. And whereas the serum and red concretion are easily incorporated together, it will be found, that this glue, after its separation, becomes immiscible with either. We have, by gentle drying, converted it into a perfectly tough elastic membrane; and, by the means of a small portion of the red mafs being left adhering to it, into a substance resembling muscular flesh; and it is capable of undergoing various changes into corruption, in the same manner as either of these.

"Now, I can see no reason why this gluten, in its morbid state, may not separate itself from the circulating blood, and be deposited in the cavities of the body, as readily as the serum does in dropsies; the former having always a less disposition than the latter to incorporate with the mafs.

"In dissecting persons who died of fevers in London and Minorca, and where no infection was suspected, appearances similar to these have all fallen under the inspection of those accurate anatomists Drs Hunter and Cleghorn. Hence it may be presumed very difficult to distinguish fevers that are produced by infection, from some others. I cannot, however, be induced to think, as those gentlemen seem to do, that these preternatural substances which were found in the cavities of the body are the consequence, but rather that they are the cause, of the inflammation and exoriations. I believe these substances to be at first diseased extravasated gluten, and conjecture their different states greatly to depend upon the different times at which they were deposited.

"I have remarked, in a variety of dead bodies, three different kinds of extravasation; these occurred in such as had died of the scurvy, the consumption, and of fevers. In the former of those diseases, red coagulated blood is found extravasated in almost all parts of the body, not only into the tela cellulosa, but into the bellies of the muscles, particularly of the legs and thighs, which often become quite stuffed, and even distorted, with large grumous masses. The intestines and mesentery are often spotted also with extravasated blood; and I have seen large ecchymoses on the stomach. Those appearances, at first sight, resembled so many distinct mortifications; and by this appearance some anatomists have been deceived; but, upon a nice examination, the texture of the parts is found to be found and firm. There is likewise, in that disease, sometimes an extravasation of water, chiefly collected in, and always, when in the legs, confined to, the tela cellulosa.

"But whereas, in the limbs of scorbutic persons, it is extremely difficult to make a good dissection by reason of such quantities of extravasated blood that every-where obstruct the operator; so, on the contrary, the lower extremities of those who have died consumptive, with swelled legs, are, of all other subjects, in the best state to afford a satisfactory view of the muscles. The water inclosed in their legs having insinuated itself, by passing the tela cellulosa, into the spaces between the muscles, the muscles are easily separated from each other; and their several origins and insertions may be distinctly traced by means of their

having been cleansed and washed by the water in the investing cellular membrane. Thus there are extravasations of three sorts; viz. first, the grumous mafs in the scurvy; and this I have often remarked where no serum was observed. Secondly, The serum alone in anasarca swellings. The third and last is what was taken notice of in those who died of fevers, being the gluten of the blood, accompanied for the most part with some serum; both of them altogether confined in the large cavities of the body.

"I conjecture, that in those fevers there is always an ulcerous or purulent disposition in the blood; and that this gluten, or coagulable lymph, is greatly diseased. I have frequently seen it have a true purulent appearance soon after it was drawn off, when the patient seemed not very ill.

"And I further conjecture, that the mischief often lies within the breast; as also that the great benefit derived from the very early application of blisters, in a great measure flows from so many ulcerations and vents being timely provided for the free discharge of those purulent and tainted particles from the body.

"If an infection depends, as many have imagined, on the admission of certain foreign particles into the blood, this gluten seems to be its more immediate seat, and to be primarily affected by it; and a discharge of this, as though by washing those particles out of the body, tends in a great measure to remove the disease.

"It is an observation of the best practical writers, that issues and letons are most excellent preservatives against receiving an infection, nay, even that of the plague itself. And indeed a suppurating and plentiful discharge from a proper ulcer, whether produced by nature or by art, seems to open a channel the best appropriated for an exit out of the body to some of the most malignant poisons. Thus the most favourable crisis in the plague, and in most pestilential fevers, happens when nature excites tumours kindly suppurating in the groin or arm-pits, by whose beneficial and plentiful discharges the deadly poison is expelled from the constitution.

"I have observed it to be amongst the most certain characteristics of the worst fevers, that the blisters either do not rise and fill, or discharge such yellow, greenish, fetid, and highly offensive stuff, that even experienced nurses could give a pretty certain conjecture, from the blisters, of the different degrees of malignity in the fever. We have more than once endeavoured to conceal the bad state of some patients in the hospital; but a discovery was always made of their condition in the wash-house, from the linen sent there stained with the discharges from the blistered parts. And indeed a careful inspection of the state and discharge from the blisters, together with their effects, furnishes us, in those diseases, with some of the most certain diagnostics of their nature, and prognostics of their event."

*Prognosis.* This distemper, where it attacks with violence, is generally fatal; the prognosis therefore must be commonly unfavourable, and always uncertain; neither can any thing more be said on this subject, than that an abatement of the symptoms already enumerated affords a favourable prognostic, and an increase of them the contrary.

*Cure.* The cure of this terrible disease, according to Dr Hillary, is very easy and simple. His indications are, 1. To moderate the too great and rapid motion of the fluids, and abate the too great heat and violence of the fever in the two first days of the disease, as much and as safely as we can. 2. To evacuate and carry out of the body as much of the putrid bile and other humours, and as expeditiously and safely, as we possibly can. 3. To put a stop to the putrescent disposition of the fluids, and to prevent the gangrenes from coming on by suitable antiseptics.

The first indication is answered by bleeding, which, in the first stage of this fever, is absolutely necessary in some degree: the quantity to be taken away must be determined by the age and strength of the patients, the degree of plethora, fulness of the pulse, &c. When called in at the beginning, he orders 12, 14, 16, 18, or 20 ounces of blood to be taken away on the first or second day: and if the patient's pulse rises after the first bleeding, or if the fever still continue high and the pulse full, he repeats the bleeding once on the days above-mentioned. But bleeding a third time is seldom or never required; neither is bleeding on the third day almost ever required; and when it is performed on that day, it ought to be done with the greatest caution and judgment: neither should a vein be opened after the third day in this fever, unless some very extraordinary symptoms and circumstances require it; which seldom or never happen. On that day, indeed, the pulse generally sinks, and the blood is in such a dissolved state, that bleeding must be accounted highly pernicious. Nevertheless, it is indispensably necessary in the beginning of the distemper; and if omitted at that time, the violent heat and motion of the blood increase the putrescence of the humours to such a degree as to bring on the fatal consequences much sooner than would otherwise have happened.

After bleeding, we come to the second indication of cure, namely, to evacuate as much of the bilious and putrid humours as soon and as safely as we can. The great irritation of the stomach, by the putrid bilious humours constantly attending this fever, with almost continual retchings and violent vomitings, seem to indicate the giving of an emetic; but the coats of the stomach are always observed to be so violently stimulated and irritated, and most commonly inflamed, by the acrimony of the putrescent bile, that any emetic, even the most mild and gentle, given in the smallest dose, brings on an incessant vomiting, which continues, in spite of all remedies, till a mortification and death ensue. Instead of this, it is proper to give large draughts of warm water, which, without any additional stimulus to the coats of the stomach, evacuates its acrid and putrid contents, commonly with great relief to the patient: the warm water also acts as an emollient fœtus to the inflamed coats of the stomach; and thus abates the inflammation, and prevents the gangrene and mortification from coming on.

After the patient has by this means vomited seven or eight times or oftener, and discharged a great quantity of yellow and blackish bilious matter as they often do, a grain or a grain and a half of Thebaic extract is given in order to procure some respite from the violent reaching, vomiting, and anxiety. The per-

son is desired to take nothing into his stomach for two hours after this, by which means it is seldom or never rejected; and thus all the symptoms are considerably abated, the reaching and vomiting either totally cease or are very much lessened, so that medicines may now be exhibited which the stomach would not have retained before. These are cooling acid juleps, or other antiseptic remedies; but neither nitre nor any of its preparations will commonly be found to stay on the stomach; nor are the nitrous medicines, or even the common anti-emetic draughts, proper to be given in this disease, even though they should agree with the stomach, on account of their attenuating property.

If the patient has not a stool or two after drinking the warm water and vomiting, it is necessary to give a gentle purging clyster; and when six or eight hours rest have been obtained, a gentle antiphlogistic and antiseptic purge, in order to evacuate by stool as much of the bilious matter as we possibly can. Or if the patient has a purging before, which sometimes though very rarely happens, a dose of toasted rhubarb is given, and an antiseptic anodyne after it has operated to abate and check the too great purging, but not to stop it, as this evacuation has been always observed to be of service, provided it is not too violent.

After this indication is completely answered, the next is to exhibit such proper antiseptic medicines as may stop the putrescent disposition of the fluids. Here the bark would seem to be the most proper remedy; but unluckily the stomachs of the patients in this disease are so much irritated, and so apt to reject every thing, that the bark cannot be retained in any form whatever. In this case Dr Percival recommends columbo-root, the infusion of which is found to be a powerful antiemetic and antiputrescent medicine, and might perhaps so far alter the state of the stomach as to make it bear the bark. Our author, however, who was ignorant of the virtues of columbo, substituted the *radix serpentarie Virginianæ* with success. A slight infusion of this root not only sat easily on the stomach of the patients, but moderately raised the pulse and fever, both of which are now too low. The following receipt was found the most agreeable and efficacious.

R. Rad. serpent. Virginian. ʒiii.

Croc. Ang. ʒss. M. et infunde vase clauso in aq. bul. q. per horam unam ut col. ʒvi. Adde aq. menth. simp. ʒii. Vin. Maderiens. ʒiv. Syr. croc. vel syr. e mecon. ʒi. Elix. vitrioli. acid. q. f. ad grat. acidior. sapor. Exhibe cochlear. duo vel tria singulis horis vel bihoris, vel sæpius pro re nata.

By the use of this medicine, and soft light nourishment taken in small quantities, the pulse is usually kept up and the distemper goes off. But if, after taking this a little while, we find that the pulse does not rise, but on the contrary that a coldness of the extreme parts comes on, the medicines must be made more warming, by increasing the quantity of the snake-root and saffron, or by adding *vinum croceum*, *confectio cardiaca*, or the like, but not by the use of volatile spirits and salts, which hurt by their stimulating and dissolving qualities. Blisters our author reprobates in the strongest terms, and affirms that he has seen the place where a blister was applied turned perfectly black and sphacelated; so that if the spine and end of the ribs



ribs had not hindered, a large square phallage would have been opened into the cavity of the thorax, had the patient lived a few hours after it.

At the same time that the strength of the patient is kept up by the medicines above-mentioned, or by others similar, he gave repeated gentle purgatives every second or third day, and sometimes, when the symptoms are very urgent, every day, for four or five days successively. But if proper methods be taken in the beginning of the disease, it is seldom that such a repetition of purging is necessary; and the Doctor gives the following remarkable instance of the efficacy of this method of treating the disease: "A young man about 24 years of age, surgeon to a Guinea ship, was brought into a house where I was visiting a patient; he was of a sanguine robust constitution, and a lover of spirituous liquors, and had been drunk three days and nights successively, and in that condition had run several races on the hot sea-shore, near noon, with the sailors, in the heat of the sun; and to complete his folly, lay the last night after that exercise, in the open air under a tamarind-tree all the night, where he was seized in the morning with all the symptoms of this fever, in the most violent manner that I have ever seen any one. In this condition he was brought to the house where I was: his retching and vomiting were so incessant, that he could not get time to say yes, or no, to the questions which I asked, without waiting some time for it, each time; his eyes were red and inflamed, attended with a burning heat, as usual in the beginning of this fever; and he had all the other symptoms which attend the first attack of this fever, in the most violent manner, which I need not repeat. I ordered ʒxvi. of blood to be taken from him, which was very florid, thin, and much dissolved; and then directed him to drink warm water freely, and to vomit eight or ten times; and after that to take *extract. Thebaic. gr. jfs.* and take nothing for two hours after it. But I being gone, and he finding that he vomited with more ease, less sickness and retching, with the warm water, than he did before, and being much alarmed at his having this fever, he drank three gallons of the water, and brought up great quantities of yellow and blackish bilious matter with it, and washed his stomach effectually. He then took the *extr. thebaic.* and slept three or four hours after it; and the vomiting ceased: he took some panada, and four hours after that the purge of manna and tamarinds, &c. which gave him eight stools, and carried a good deal more of the putrid bilious matter off downwards; and got some rest after it: he then took of an antiseptic julep often, and light nourishment, a little acid, at the intervals; and repeated the purge on the third day, as directed. I being called out of the town, I did not see him till the fourth morning after; he said that he had followed my directions; and I found him free from the fever and all its symptoms, but weak and low, and his skin a little yellow, but much less so than usual, unless when the bilious matter is thus carried off. I ordered him to take *elix. vitrioli acid. gut. lx.* three or four times a-day for a few days, in an infusion of mint-leaves with a little snake-root, made as tea; which he did, and soon recovered perfectly well in seven or eight days time.

"This patient being seized in so violent a manner,

and recovering in so short a time, and so near to the rule which the elegant Celsus recommends, *Citò, tutò, et jucundè*, not only confirmed the above manner of reasoning on the cause and nature of this disease to be right, but made me determine to follow the same method as near as I possibly could ever find, and I must add, with the same good success also, when I am called to early on in the disease that I can strictly pursue it: which is too seldom the case; for in general the physician is not called in till the fourth or fifth day, or after, when the putrid acid bilious matter is a great part of it carried into the blood, which it has so dissolved and brought its whole mass into a colliquated, putrid, gangrenous state, that the best of methods, and the most efficacious medicines, however judiciously timed and applied, are precarious and uncertain; or sometimes it is so far advanced, that the ablest physician can do no more than tell the relations of the sick that it is too late, and that they can live but a few hours: for I know no disease in which the recovery of the patient so much depends upon the right or wrong method of treating it, at the very first attack or beginning of the disease, as this fever does: for by thus discharging and carrying the putrid, acrimonious, bilious matter, out of the body before much of it is carried into the blood, not only most of the bad symptoms which attend the second stage of the fever are prevented from coming, but the hemorrhages, and the yellowness of the skin, &c. also, and the fever soon taken off too; for I have never seen any hemorrhage come on, and but little yellowness, or in some none, when they were thus treated.

"And when the last stage of this fever is come on before we are called in, provided that it is not at the very latter end of it, I have always found that this method of gentle purging, whenever the before-mentioned symptoms indicate it, and a liberal use of the antiseptic medicines in the intervals, has been so successful, that I have seen but two patients that have died in this fever during the eight years past in which I treated it in this manner; and one of them was so weak that he could not take a spoonful of any thing, and so near his end that he died about two hours after without taking any medicine; and the other killed himself by drinking a gallon of cold water in less than three hours time, (after taking half an ounce of manna in the morning), which struck such a coldness into his whole body that he died; though I have visited several every year, and in some years a great many: therefore I take the liberty of recommending this method to others, and wish it to be as successful to all."

To the genus of *typhus* also belong all those fevers attended with very profuse and debilitating sweats, and which have sometimes, not without good reason, been accounted plagues; such as the English sweating-sickness, Miliaris sudatoria, *Sauv. sp. 5.* Ephemera sudatoria, *Sauv. sp. 7.* Ephemera Britannica, *Caius; de ephem. Britan.*

### XXX. SYNCHUS. Genus VI.

Synchus *Sauv. gen. 81. Lin. 13.*

Lenta *Lin. 14.*

Phrenitis *Veg. 18.*

Febris continua putrida *Boerh. 730.*

This is a contagious distemper, being a complication

PRACTICE tion of a synocha and typhus; for the description and cure of which, we must of consequence refer to what hath been already said concerning these diseases.

### XXXI. The *Hætic* Fever.

*Hætica*, *Sauv.* gen. 83. *Lin.* 24. *Vog.* 80. *Sag.* 684.

This disease is reckoned by Dr Cullen to be merely symptomatic; as indeed seems very probable, seeing it always accompanies absorptions of pus into the blood from internal suppurations, or indeed from such as are external, provided they are very large or of a bad kind.

*Description.* The best, indeed the only proper description of this disorder we have, is that by Dr Heberden. According to him, the appearance of the hætic fever is not unlike that of the genuine intermittent; from which, however, the disease is very different in its nature, as well as infinitely more dangerous. In the true intermittent, the three stages of cold, heat, and sweat, are far more distinctly marked, the whole fit is much longer, the period which it observes is more constant and regular, and the intermissions are more perfect, than in the hætic fever. For in the latter, even in the clearest remission, there is usually a feverish quickness perceptible in the pulse, which seldom fails to exceed the utmost limit of a healthy one by at least ten strokes in a minute.

The chilliness of the hætic fever is sometimes succeeded by heat, and sometimes immediately by a sweat without any intermediate state of heat. The heat will sometimes come on without any remarkable chilliness preceding; and the chilliness has been observed to go off without being followed either by heat or sweat. The duration of these stages is seldom the same for three fits together; and as it is not uncommon for one of them to be wanting, the length of the whole fit must vary much more than in the true intermittent; but in general it is much shorter.

The hætic patient is little or nothing relieved by the coming on of the sweat; but is often as anxious and restless under it, as during the chilliness and heat. When the sweat is over, the fever will sometimes continue; and in the middle of the fever the chilliness will return; which is a most certain mark of this disease.

The hætic fever will return with great exactness, like an intermittent, for two or perhaps three fits; but Dr Heberden informs us, that he does not remember ever to have known it keep the same period for four fits successively. The paroxysm will now and then keep off for ten or twelve days; and at other times, especially when the patient is very ill, it will return so frequently on the same day, that the chilliness of a new fit will follow immediately the sweat of the former. It is not unusual to have many threatenings of a shivering return in the same day; and some degree of drowziness is apt to attend the cessation of a fit.

The urine in a true intermittent is clear in the fits, and turbid in the intervals; but in the hætic fever it is liable to all kinds of irregularity. It will be equally clear or turbid in both stages; or turbid in the fits and clear in the intervals; and sometimes it will be, as in a true intermittent, clear during the fever, and thick at the going off.

Hætic patients often complain of pains like those of the rheumatism, which either affect by turns almost

every part of the body, or else return constantly to the same part; which is often at a great distance from the seat of the principal disorder, and, as far as is known, without any peculiar connection with it. Those pains are so violent in some patients, as to require a large quantity of opium. As far as Dr Heberden has observed, they are more common, where the hætic arises from some ulcer open to the external air, as in cancers of the face, breast, &c. Joined with this fever, and arising probably from one common cause, he has been surprised to see swellings of the limbs, neck, or trunk of the body, rise up almost in an instant, as if the part was all at once grown fatter. These swellings are not painful, hard, or discoloured, and they continue for several hours.

Dr Heberden has seen this fever attack those who seemed in tolerable health, in a sudden and violent manner, like a common inflammatory one; and like that, also, in a very short time bring them into imminent danger of their lives; after which it has begun to abate, and to afford hopes of a perfect recovery. But though the danger might be over for the present, and but little of a fever remain; yet that little has soon shewed, that it was kept up by some great mischief within, and, proving unconquerable by any remedies, has gradually undermined the health of the patient, and never ceased except with his life. This manner of its beginning, however, is extraordinary. It much oftener dissembles its strength at first; and creeps on so slowly, that the subjects of it, tho' they be not perfectly well, yet for some months hardly think themselves ill; complaining only of being sooner tired with exercise than usual, of want of appetite, and of falling away. But gentle as the symptoms may seem, if the pulse be quicker than ordinary, so as to have the artery to beat 90 times and perhaps 120 times in a minute, there is the greatest reason to be apprehensive of the event. In no disorder, perhaps, is the pulse of more use to guide our judgment than in the hætic fever: yet even here we must be upon our guard, and not truly entrust to this criterion; for one in about 20 patients, with all the worst signs of decay from some incurable cause, which irresistibly goes on to destroy his life, will shew not the smallest degree of quickness, nor any other irregularity of the pulse, to the day of his death.

*Cause, &c.* This fever will supervene whenever there is a great collection of matter formed in any part of the body; but it more particularly attends upon the inflammation of a scirrhous gland, and even upon one that is slight and only just beginning; the fever growing worse in proportion as the gland becomes more inflamed, ulcered, or gangrenous. And such is the lingering nature of those glandular disorders, that the first of those stages will continue for many months, and the second for some years.

If this scirrhous inflammation be external, or in the lungs, or some of the abdominal viscera, where the disturbance of their functions plainly points out the seat of the disorder, no doubt can be entertained concerning the cause of the fever. But if the part affected be not obvious to the senses, and its precise functions be not known, the hætic, which is there only part of the train of another disease, may be mistaken for the primary or only one.

Lying-in women, on account of the violence sustained in delivery, generally die of this fever. Women of the age of near 50 and upwards are particularly liable to it. For, upon the cessation of their natural discharge, the glands of the breasts, ovaries, or womb, too commonly begin to grow scirrhous, and proceed to be cancerous. Not only these, but the glandular parts of all the abdominal viscera, are disposed to be affected at this particular time, and to become the seats of incurable disorders.

The injuries done to the stomach and liver by hard drinking are attended with similar symptoms, and terminate in the same manner.

Dr Heberden observes, that the slightest wound by a fine pointed instrument is known upon some occasions to bring on the greatest disturbances, and the most alarming symptoms, nay even death itself. For not only the wounded part will swell and be painful, but by turns almost every part of the body; and very distant parts have been known to come even to suppuration. These symptoms are constantly accompanied with this irregular intermittent, which lasts as long as any of them remain.

*Prognosis.* This anomalous fever is never less dangerous than when it belongs to a kindly suppuration, into which all the diseased parts are melted down, and for which there is a proper outlet.

The symptoms and danger from some small punctures, with their concomitant fever, most frequently give way in a few days; though in some persons they have continued for two or three months, and in others have proved fatal.

The inflammation of internal scirrhous glands, or of those in the breasts, sometimes goes off, and the fever, which depended upon it, ceases; but it much oftener happens, that it proceeds to cancerous and gangrenous ulcers, and terminates only in death.

*Cure.* The same medicines are not likely always to suit a fever which, arising from very different causes, is attended with such a variety of symptoms. A mixture of alafetida and opium has in some persons seemed singularly serviceable in this fever, when brought on by a small wound; but in most other cases the principal if not the sole attention of the physician must be employed in relieving the symptoms, by tempering the heat, by preventing both coliciveness and purging, by procuring sleep, and by checking the sweats. If, at the same time, continues Dr Heberden, he put the body into as good general health as may be, by air, exercise, and a proper course of mild diet, he can perhaps do nothing better than to leave all the rest to nature. In some few fortunate patients, nature appears to have such resources, as may afford reason for entertaining hopes of cure, even in very bad cases. For some have recovered from this fever attended with every symptom of an abdominal vicus incurably diseased, after all probable methods of relief from art had been tried in vain, and after the flesh and strength were so exhausted as to leave scarce any hopes from nature. In those deplorable circumstances, there has arisen a swelling not far from the probable seat of the disorder, and yet without any discoverable communication with it. This swelling has come to an abscess; in consequence of which the pulse has soon returned to its natural state, as have also the appetite, flesh, and strength.

What nature has performed in those rare cases, Dr Heberden acquaints us, he has often endeavoured to imitate, by making issues or applying blisters near the seat of the disease; but he cannot say with the same success.

It seems at present, Dr Heberden observes, the opinion of many practitioners, that the gangrenes will be stopped, and suppuration become more kindly, by the use of bark; and therefore this remedy is always either advised or permitted in the irregular fever joined with suppurations and gangrenes. But he affirms he does not remember ever to have seen any good effect from the bark in this fever unattended with an apparent ulcer; and even in gangrenes it so often fails, that in successful cases, where it has been administered, there must be room for suspicion that the success was owing to another cause. Dr Heberden acknowledges at the same time, that he never saw any harm from the bark, in these, or indeed in any other cases, except a purging or sickness of no consequence, where it has happened to disagree with the stomach, or where the latter has been loaded by taking the medicine too fast, especially in dry boluses wrapped in wafer-paper.

In hectic illnesses, where all other means have proved ineffectual, a journey to Bath is usually propounded by the friends, and wished for by the sick; but Dr Heberden justly observes, that, besides the fatigue and many inconveniences of a journey to a dying person, the Bath waters are peculiarly hurtful in this fever, which they never fail to increase, and thereby aggravate the sufferings and hasten the death of the patient.

## ORDER II. PHLEGMASIÆ.

Phlegmasiæ membranosæ et parenchymatosæ, Sauv.

Class III. Ord. I. II. *Sag.* 605.

Morbi febriles phlogistici, *Lin.* Class III.

Febres continuæ compositæ inflammatoriæ, V.

Morbi acuti febriles, *Boerh.* 770.

Febres inflammatoriæ, *Hoffm.* II. 105. *Junk.* 61.

XXXI. PHLOGOSIS. Genus VIII. Sp. I.

Phlegmone auctorum, Sauv. gen. 15. *Lin.* 39.

*Vog.* 351.

Inflammati, *Lin.* 231. *Boerh.* 370. *Junk.* 20.

This disease is a synocha fever, accompanied with an inflammation of some particular part either external or internal, and consequently varies very much in its form and the degree of danger attending it, according to the situation and functions of the part affected with topical inflammation. To this species, therefore, belong the following diseases.

Furunculus, Sauv. gen. 18. *Vog.* 352.

Terminthus, *Vog.* 381.

Pupula, *Lin.* 275. Sauv. p. 6.

Varus, *Vog.* 436. *Lin.* 269. Sauv. p. 7.

Bacchia, *Lin.* 270.

Gutta rosea, Sauv. gen. 4.

Gutta rosacea, *Vog.* 437.

Hordeolum, Sauv. gen. 27. *Lin.* 276. *Vog.* 434.

Otalgia, Sauv. gen. 197. *Lin.* 44. *Vog.* 148.

Dolor otalgicus, *Hoffm.* II. 336.

Parulis, *Vog.* 362.



- Maftodynia, Sauv. Gen. 210. Vog. 153.*  
*Paronychia, Sauv. Gen. 21. Lin. 258. Vog. 345.*  
*Anthroence, Sauv. Gen. 78. Lin. 256.*  
*Pædarthroace, Vog. 419.*  
*Spina ventofa, Boerh. 526.*  
*Phimofis, Sauv. Gen. 22. Lin. 297. Vog. 348.*  
*Paraphimofis, Vog. 349.*

For the cure of inflammations, Dr Cullen lays down the following indications. 1. To remove the remote caufes when they are evident and continue to operate. 2. To take off the phlogiftic diathefis affecting the whole fyftem, or the particular part. 3. To take off the fpafm of the particular part by remedies applied to the whole fyftem or to the part itfelf.

The means of removing the remote caufes will readily occur, from confidering the particular nature and circumftances of the different kinds. Acrid matters muft be removed, or their action muft be prevented, by the application of demulcents. Compreffing and overftretching powers muft be taken away; and, from their feveral circumftances, the means of doing fo will be obvious.

The means of taking off the phlogiftic diathefis of the fyftem are the fame with thofe already mentioned under the cure for fynocha. The means of taking off the fpafm alfo from the particular part, are much the fame with thofe already mentioned. Only it is to be remembered, that topical bleedings, fuch as cupping with fcarification, applying leeches, &c. are in this cafe much more indicated; and that fome of the other remedies are to be directed more particularly to the part affected, as fhall be more fully confidered when we treat of thofe difeafes attended with particular inflammations.

When a tendency to fuppuration is perceived, the proper indication is to promote the production of perfect pus as much as poffible. For this purpofe various remedies, fuppofed to poffefs a fpecific power, have been propofed: but it does not appear that any of them are poffeffed of a virtue of this kind; and, in our author's opinion, all that can be done is to favour the fuppuration by fuch applications as may fupport a moderate heat in the part, by fome tenacity confine the perfpiration, and by an emollient quality may weaken the cohefion of the teguments, and favour their erofion. As all abfcefles are occafioned by the effufion of fluids, and as in the cafe of certain effufions a fuppuration becomes not only unavoidable but defirable, it may be fuppofed that moft of the means of procuring a refolution by diminifhing the force of circulation, &c. ought to be avoided. But as we obferve on the one hand, that a certain degree of increafed impetus, or of the original fymptoms of inflammation, is neceffary to produce a proper fuppuration; fo it is then efpecially neceffary to avoid thofe means of refolution which may diminifh too much the force of circulation. And on the other hand, as the impetus of the blood, when violent, is found to prevent the proper fuppuration; fo, in fuch cafes, though a tendency to fuppuration may have begun, it may be proper to continue thofe means of refolution which moderate the force of the circulation. With refpect to the opening of abfcefles when completely formed, fee the article SURGERY.

When an inflammation has taken a tendency to gangrene, that event is to be prevented by every poffible

means; and thefe muft be different according to the nature of the feveral caufes: but after a gangrene has in fome degree taken place, it can be cured only by the feparation of the dead from the living parts. This in certain circumftances can be performed, and moft properly, by the knife. In other cafes it can be done by exciting a fuppuratory inflammation on the verge of the living part, whereby its cohefion with the dead part may be every where broken off, fo that the latter may fall off by itfelf. While this is doing it is proper to prevent the further putrefaction of the part, and its fpreeding wider. For this purpofe various antifeptic applications have been propofed: but Dr Cullen is of opinion, that while the teguments are entire, thefe applications can hardly have any effect; and therefore, that the fundamental procedure muft be to fcarify the part fo as to reach the living fubftance, and, by the wounds made there, to excite the fuppuration required. By the fame incifions alfo, we give accefs to antifeptics, which may both prevent the progrefs of the putrefaction in the dead, and excite the inflammation neceffary on the verge of the living parts.

When the gangrene proceeds from the lofs of tone, and when this communicated to the neighbouring parts prevents that inflammation which, as we have faid, is requifite to the feparation of the dead parts from the living, it will be neceffary to obviate this lofs of tone by tonic medicines given internally; and for this purpofe the Peruvian bark has been found to be moft effectual. But when the gangrene arifes from the violence of inflammation, the bark may not only fail of proving a remedy, but may do harm: for its power as a tonic is efpecially fited to thofe cafes of gangrene which proceed from an original lofs of tone, as in the cafe of palfy and oedema; or in thofe cafes where a lofs of tone takes place while the original inflammatory fymptoms are removed.

On the other hand, Mr Bell is of opinion, that incifions made with a view to admit the operation of antifeptic remedies in gangrenes, as well as the remedies themfelves, muft be pernicious by reafon of the irritation they occafion, and by the danger of wounding blood-veffels, nerves, tendons, &c. alfo by allowing a free paffage for the putrefcent fluids into the parts not yet affected. And unlefs they are carried fo deep as to reach the found parts, applications of the antifeptic kind can never have any effect in answering the purpofe for which they were intended. The fame author alfo remarks, that all the advantages commonly obferved from the great number of applications recommended for gangrene, are obtained with more eafe, and generally too with more certainty, from the ufe of fome gentle ftimulating embrocation; which, by exciting a flight irritation upon the furface, efpecially when affifted by a free ufe of the bark, produces, for the moft part, fuch a degree of inflammation as is wifhed for. With this view he has frequently known a weak folution of fal ammoniac, a drachm of the falt to two ounces of vinegar and fix of water, form a mixture of a very proper ftrength for every purpofe of this kind. But the degree of ftimulus can eafily be either increafed or diminifhed according to circumftances, by ufeing a larger or fmall proportion of the falt.

Whenever, either by the means recommended, or by a natural exertion of the fyftem, a flight inflammation

appears between the diseased and sound parts, we may in general, with tolerable certainty, expect, that in due time the parts will be separated; and when a full supuration is once fairly established, there can be little doubt that the mortified parts will be soon and easily removed.

A complete separation being effected, the remaining sore is to be treated in the manner described under the article SURGERY; with a proper attention, at the same time, to the support of the general system by the continuance of a nourishing diet, the bark, and such quantities of wine as may seem necessary.

With regard to the bark, however, it is proper to take notice of another case of mortification in which it is likewise unsuccessful, as well as in that attended with an high degree of inflammation; and that is, in those mortifications of the toes and feet, common in old people, or which arise from any cause increasing the rigidity of the vessels to such a degree as to prevent the motion of the fluids through them. In this case Mr Pott has discovered, that all kinds of warm applications are very unsuccessful; but that by the free use of opium, together with sedatives and relaxants externally applied, he has frequently seen the tumefaction of the feet and ancles subside, the skin recover its natural colour, and all the mortified parts separate in a very short time, leaving a clean fore. But as to scarifications, or any other attempt to separate artificially the mortified from the sound parts, he thinks them very prejudicial, by giving pain; which is generally of itself violent in this disease, and which seems to have a great share in producing the other evils.

The other terminations of inflammation either do not admit of any treatment, except that of preventing them by resolution, or properly belong to the article SURGERY.

Erythema cum œdemate.

Erysipelas symptomaticum, Sauv. sp. 6.

The word *erythema* doth not apply to any primary disease, but to a great number of those cutaneous inflammations denominated by another general term, viz. the *erysipelas*, or *St Anthony's fire*; and which being commonly symptomatic of some other inflammation or disorder, are to be removed only by removing the primary disease: the erythema is found scarcely to bear any kind of warm application to itself; and is very apt, if treated as a primary disease, to terminate in a gangrene of the part affected, or other disorder still more dangerous. The difference between the *phlegmon* or preceding species, and *erythema*, according to Dr Cullen, is, that, in the former, the inflammation seems particularly to affect the vessels on the internal surface of the skin, communicating with the lax adjacent cellular texture; whence a more copious effusion, and that too of serum convertible into pus, takes place. In the erythema the affection is of the vessels on the external surface of the skin communicating with the *rete mucosum*, which does not admit of any effusion but what separates the cuticle and gives occasion to the formation of a blister, while the smaller size of the vessels admits only of the effusion of a thin fluid very seldom convertible into pus. For the cure of the fever attended with erythema, or *erysipelas*, see below; and for the external treatment of erythema, see the article SURGERY.

XXXIII. OPHTHALMIA, or Inflammation of the EYES. GENUS VIII. Sp. I. 1. A. B. 2. Sp. II. 1. 2.

Ophthalmia, Sauv. gen. 196. Lin. 43. Vog. 341. 283

Sag. 231. Junck. 24.

Chemosis, Vog. 46.

Ophthalmites, Vog. 47.

Inflammatio oculorum, Hoffm. II. 165.

Ophthalmia taraxis, Sauv. sp. 1.

Ophthalmia humida, Sauv. sp. 8.

Ophthalmia chemosis, Sauv. sp. 12.

Ophthalmia erysipelatosaf, Sauv. sp. 7.

Ophthalmia pustulosa, Sauv. sp. 6.

Ophthalmia phlyctenodes, Sauv. sp. 21.

Ophthalmia choreoides, Sauv. sp. 13.

Ophthalmia tenebriosa, Sauv. sp. 10.

Ophthalmia trachoma, Sauv. sp. 4.

Ophthalmia sicca, Sauv. sp. 5.

Ophthalmia angularis, Sauv. sp. 14.

Ophthalmia tuberculosa, Sauv. sp. 3.

Ophthalmia trichialis, Sauv. sp. 2.

Ophthalmia cancrofa, Sauv. sp. 15.

Ophthalmia synechia, Sauv. sp. 16.

Ophthalmia a lagophthalmo, Sauv. sp. 17.

Ophthalmia ab elcomate, Sauv. sp. 18.

Ophthalmia ab ungue, Sauv. sp. 19.

Ophthalmia a cornuæ fistula, Sauv. sp. 20.

Ophthalmia nuxæ, Sauv. sp. 22.

Ophthalmia metastatica, Sauv. sp. 24.

Ophthalmia scrophulosa, Sauv. sp. 9.

Ophthalmia syphilitica, Sauv. sp. 11.

Ophthalmia febricosa, Sauv. sp. 23.

FROM reading this long list of distinctions which authors have invented in the ophthalmia, it is evident, that by far the greatest part of them are symptomatic,

## XXXII. Phlogosis ERYTHEMA. Sp. II.

Erythema, Sauv. gen. 11.

Erysipelas auctorum, Vog. 343.

Hieropyr. N. 344.

Anthrax, Sauv. gen. 19. Lin. 272. Vog. 353.

Carbo et carbunculus auctorum.

Erythema gangrenosum, Sauv. sp. 7.

Erythema a frigore.

Erythema pernio, Sauv. sp. 4.

Pernio, Lin. 259. Vog. 350.

Erythema ambustum, Sauv. sp. 2.

Erysipelas ambustum, Sauv. sp. 4.

Combustura, Lin. 245.

Combustum, Boerh. 476.

Encausis, Vog. 347.

Erythema ab acri alieno applicato.

Erysipelas Chinense, Sauv. sp. 7.

Erythema ab acri inquilino.

Erythema intertrigo, Sauv. sp. 5.

Intertrigo, Lin. 247. Vog. 502.

Erythema a compressione.

Erythema paratrma, Sauv. sp. 6.

Erythema a punctura, Sauv. sp. 9.

Erysipelas a vespis, Sauv. sp. 19.

Plydracia a vespis, Sauv. sp. 2.

Erythema cum phlegmone.

Erysipelas phlegmonodes auctorum.

PRACTICE or merely the consequences of other disorders present in the habit; and therefore the remedies must be directed towards the removal of these primary disorders; and when they are gone the ophthalmia will be removed of course. Dr Cullen observes, that the inflammation of the eye may be considered as of two kinds; according as it is seated in the membranes of the ball of the eye, when it is named *ophthalmia membranarum*; or as it is seated in the sebaceous glands placed in the tarsus, or edges of the eye-lids, in which case it may be termed *ophthalmia tarsi* \*. These two kinds are very frequently connected together, as the one may excite the other; but they are still to be distinguished according as the one or the other may happen to be the primary affection.

\* See the Nosology.

1. The inflammation of the *membranes* of the eye affects especially, and most frequently, the adnata, and appears in a turgescence of its vessels; so that the red vessels which are naturally there, become not only increased in size, but many more appear than in a natural state. This turgescence of the vessels is attended with pain, especially upon the motion of the ball of the eye; and this irritation, like every other, applied to the surface of the eye, produces an effusion of tears from the lacrymal gland.

The inflammation commonly, and chiefly, affects the adnata spread on the anterior part of the bulb of the eye; but usually spreads also along the continuation of the adnata on the inside of the palpebræ; and as that is extended on the tarsus palpebrarum, the excretories of the sebaceous glands opening there are also frequently affected. When the affection of the adnata is considerable, it may be communicated to the subjacent membranes of the eye, and even to the retina itself, which thereby acquires so great sensibility, that every impression of light becomes painful. The inflammation of the membranes of the eye is in different degrees, according as the adnata is more or less affected, or according as the inflammation is either of the adnata alone, or of the subjacent membranes also; and upon these differences, different species have been established; but they seem all to differ only in degree, and are to be cured by the same remedies more or less employed.

The proximate cause of ophthalmia is not different from that of inflammation in general; and the different circumstances of ophthalmia may be explained by the difference of its remote causes, and by the different parts of the eye which it happens to affect; as may be understood from what has been already said. We shall therefore proceed to give an account of the method of cure.

The ophthalmia membranarum requires the remedies proper for inflammation in general; and when the deeper-seated membranes are affected, and especially when a pyrexia is present, large general bleedings may be necessary. But this last is seldom the case; and, for the most part, the ophthalmia is an affection purely local, accompanied with little or no pyrexia. General bleedings therefore have little effect upon it, and the cure is chiefly to be obtained by topical bleedings, that is, blood drawn from the vessels near the inflamed part; and opening the jugular vein, or the temporal artery, may be considered as in some measure of this kind. It is commonly sufficient to apply a number of

PRACTICE leeches round the eye; and it is perhaps still better to draw blood by cupping and scarifying upon the temples. In many cases, the most effectual remedy is to scarify the internal surface of the inferior eye-lid, and to cut the turgid vessels upon the adnata itself.

Besides blood-letting, purging, as a remedy suited to inflammation in general, has been considered as peculiarly adapted to inflammation in any part of the head, and therefore to ophthalmia; and it is sometimes useful: but, for the reasons given before with respect to general bleeding, purging in the case of ophthalmia does not prove useful in any proportion to the evacuation excited.—For relaxing the spasm in the part, and taking off the determination of the fluids to it, blistering near the part has commonly been found useful.

Ophthalmia, as an external inflammation, admits of topical applications. All those, however, which increase the heat and relax the vessels of the part, prove hurtful; and the admission of cool air to the eye, and the application of cooling and astringent medicines, which at the same time do not produce irritation, prove useful. In the cure of this distemper indeed, all irritation must carefully be avoided, particularly that of light; and the only certain means of doing this is by keeping the patient in a very dark chamber.

2. In the *ophthalmia tarsi*, the same medicines may be necessary as are already recommended for the ophthalmia membranarum. However, as the ophthalmia tarsi may often depend upon an acrimony deposited in the sebaceous glands of the part, so it may require various internal remedies according to the variety of the acrimony in fault; for which we must refer to the consideration of scrophula, syphilis, or other diseases with which this ophthalmia may be connected; and where these shall not be evident, certain remedies more generally adapted to the evacuation of acrimony, such as mercury, may be employed. In the ophthalmia tarsi, it almost constantly happens that some ulcerations are formed on the tarsus. These require the application of mercury and copper, which alone may sometimes cure the whole affection; and they may be useful even when the disease depends upon a fault of the whole system.

Both in the ophthalmia membranarum, and in the ophthalmia tarsi, it is necessary to obviate that glueing together of the eye-lids which commonly happens in sleep; and which may be done by insinuating a little of any mild unctuous medicine between the eye-lids before the patient shall go to sleep.

The slighter kinds of inflammations from the dust or the sun, may be removed by fomenting with warm milk and water, adding a small portion of brandy; and by anointing the borders of the eye-lids with *unguentum tullei*, or the like, at night, especially when those parts are excoriated and sore. But in bad cases, after the inflammation has yielded a little to evacuations, the *coagulum aluminosum* of the London dispensatory spread on lint, and applied at bed-time, has been found the best external remedy. Before the use of the latter, the solution of white vitriol is prescribed with advantage; and in violent pains it is of service to foment frequently with a decoction of white poppy-heads.



*Phrenitis*, *Sauv.* gen. 101. *Lin.* 25. *Sag.* gen. 301.

*Boerb.* 771. *Hoffm.* 11. 131. *Junck.* 63.

*Phrenismus*, *Veg.* 45.

*Cephalitis*, *Sauv.* gen. 109. *Sag.* gen. 310.

*Sphacelismus*, *Lin.* 32.

*Phrenitis vera*, *Sauv.* sp. 1. *Boerb.* 771.

*Phrenitis idiopathica*, *Junck.* 63.

*Cephalalgia inflammatoria*, *Sauv.* sp. 9.

*Cephalitis spontanea*, *Sauv.* sp. 3.

*Cephalitis siriasis*, *Sauv.* sp. 4.

*Siriasis*, *Veg.* 34.

*Cephalitis Littriana*, *Sauv.* sp. 5.

Dr Cullen observes, that the true *phrenitis*, or inflammation of the membranes or substance of the brain, is very rare as an original disease: but, as a symptom of others, much more frequent; of which the following kinds are enumerated by different authors.

*Phrenitis synochi pleuritica*, *Sauv.* sp. 2.

*Phrenitis synochi sanguinea*, *Sauv.* sp. 4.

*Phrenitis calentura*, *Sauv.* sp. 11.

*Phrenitis Indica*, *Sauv.* sp. 12.

*Cephalitis Aegyptiaca*, *Sauv.* sp. 1.

*Cephalitis epidemica anno 1510*, *Sauv.* sp. 6.

*Cephalitis verminosa*, *Sauv.* sp. 7.

*Cephalitis cerebelli*, *Sauv.* sp. 8.

*Phrenitis miliaris*, *Sauv.* sp. 3.

*Phrenitis variolosa*, *Sauv.* sp. 5.

*Phrenitis morbillosa*, *Sauv.* sp. 6.

*Phrenitis a plica*, *Sauv.* sp. 8.

*Phrenitis aphrodisiaca*, *Sauv.* sp. 9.

*Phrenitis a tarantismo*, *Sauv.* sp. 14.

*Phrenitis hydrophobica*, *Sauv.* sp. 15.

*Phrenitis a dolore*, *Sauv.* sp. 13.

*Cephalitis traumatica*, *Sauv.* sp. 2.

*Description.* The signs of an impending *phrenzy* are, Immoderate and continual watchings; or if any sleep is obtained, it is disturbed with dreams and gives no refreshment; acute and lasting pains, especially in the hind-part of the head and neck; little thirst; a great and slow respiration, as if proceeding from the bottom of the breast; the pulse sometimes small and slow, sometimes quick and frequent; a suppression of urine; and forgetfulness. The distemper when present may be known by the following signs: The veins of the head swell, and the temporal arteries throb much; the eyes are fixed, sparkle, and have a fierce aspect; the speech is incoherent, and the patient behaves very roughly to the by-standers, with furious attempts to get out of bed, not indeed continually, but returning as it were by paroxysms; the tongue is dry, rough, yellow, or black; there is a coldness of the external parts; a proneness to anger; chattering of the teeth; a trembling of the hands, with which the sick seem to be gathering something, and actually do gather the naps off the bed-clothes.

*Cause of, and persons subject to, this disorder.* People of a hot and bilious habit of body, and such as are of a passionate disposition, are apt to fall into a *phrenzy*. The same danger are those in who use much spices, or are given to hot and spirituous liquors; who have been exposed more than usual to the sun, or obliged to undergo immoderate studies or watchings; who are sub-

ject to head-achs, or in whom some customary hemorrhages have been stopped; or the disease may arise from some injury offered to the head externally. Dr Pringle observes, that the *phrenitis*, when considered as an original disease, is apt to attack soldiers in the summer-season when they are exposed to the heat of the sun, and especially when asleep and in liquor. A symptomatic *phrenzy* is also more frequent in the army than elsewhere, on account of the violence done to all fevers when the sick are carried in waggons from the camp to an hospital, where the very noise or light alone would be sufficient, with more delicate natures, to raise a *phrenzy*.

*Prognosis.* Every kind of *phrenzy*, whether idiopathic or symptomatic, is attended with a high degree of danger; and, unless removed before the fourth day, a gangrene or sphacelus of the meninges readily takes place, and the patient dies delirious. The following are the most fatal symptoms: A continual and furious delirium, with watching; thin watery urine, white feces, the urine and stools running off involuntarily, or a total suppression of these excretions; a ready disposition to become stupid, or to faint; trembling, rigor, chattering of the teeth, convulsions, hiccup, coldness of the extremities, trembling of the tongue, shrill voice, a sudden cessation of pain, with apparent tranquillity. The following are favourable: Sweats, apparently critical, breaking out; a seeming effort of nature to terminate the disease by a diarrhoea; a large hæmorrhage from the nose; swellings of the glands behind the ears; hæmorrhoids.

*Cure.* This is not different from the cure of inflammation in general; but here the most powerful remedies are to be immediately employed. Large and repeated bleedings are especially necessary; and these too taken from vessels as near as possible to the part affected. The opening the temporal artery has been recommended, and with some reason; but as the practice is attended with some inconveniences, perhaps the opening of the jugular veins may prove more effectual; with which, however, may be joined the drawing of blood from the temples by cupping and scarifying. It is also probable, that purging may be of more use in this than in some other inflammatory affections, as it may operate by revulsion. For the same purpose of revulsion, warm pediluvia are a remedy, but rather ambiguous. The taking off the force of the blood in the vessels of the head by an erect posture is generally useful. Blistering is also useful, but chiefly when applied near to the part affected. In short, every part of the antiphlogistic regimen is here necessary, and particularly the admission of cold air. Even cold substances applied to the head have been found useful; and the application of such refrigerants as vinegar is certainly proper. Opiates are hurtful in every inflammatory state of the brain. On the whole, however, it must be remarked, that practitioners are very uncertain with regard to the means proper to be used in this disease; and the more so, that the symptoms by which the disease is commonly judged to be present, appear sometimes without any internal inflammation; and on the other hand, dissections have shewn that the brain has been inflamed, where few of the peculiar symptoms of inflammation had appeared before.

GENUS X. CYNANCHE.

Cynanche, *Sauv. gen. 110. Lin. 33. Sag. gen. 300.*

Angina, *Vog. 49. Hoffm. II. 125. Junck. 30.*

Angina inflammatoria, *Boerh. 798.*

285 XXXV. The Inflammatory QUINSY, or CYNANCHE Tonsillaris. Sp. I.

Cynanche tonsillaris, *Sauv. sp. 1.*

Angina inflammatoria sp. 5. *Boerh. 805.*

*Description.* This is an inflammation of the mucous membrane of the fauces, affecting principally that congeries of mucous follicles which forms the tonsils; and from thence spreading along the velum and uvula, so as frequently to affect every part of the mucous membrane. The disease appears by some tumour and redness of the parts; is attended with a painful and difficult deglutition; a troublesome clamminess of the mouth and throat; a frequent, but difficult, excretion of mucus; and the whole is accompanied with pyrexia. The inflammation and tumour are commonly at first most considerable in one tonsil; and afterwards, abating in that, increase in the other. This disease is not contagious.

*Causes of, and persons subject to, the disorder.* This disease is commonly occasioned by cold externally applied, particularly about the neck. It affects especially the young and sanguine; and a disposition to it is often acquired by habit. It occurs especially in the spring and autumn, when vicissitudes of heat and cold frequently take place.

*Prognosis.* This species of quinsy terminates frequently by resolution, sometimes by suppuration, but hardly ever by gangrene; though in some cases sloughy spots appear on the fauces: the prognosis therefore is generally favourable.

*Cure.* Here some bleeding may be necessary; but large and general evacuations are seldom beneficial. The opening of the ranular veins seems to be an insignificant remedy, according to Dr Cullen, but is recommended as efficacious by Sir John Pringle; and leeches set on the external fauces are serviceable. The inflammation may be often relieved by moderate astrin-gents, and particularly by acids applied to the parts affected. In many cases, nothing has been found to give more relief than the vapour of warm water received into the fauces.

Besides these, blistering and rubefacient medicines are applied with success, as well as antiphlogistic pur-gatives; and every part of the antiphlogistic regimen is to be observed, except the application of cold. Sir John Pringle recommends a thick piece of flannel moistened with two parts of common sweet oil, and one of spirit-of-hartshorn, (or in a larger proportion, if the skin will bear it), applied to the throat, and re-newed once every four or five hours. By this means the neck, and sometimes the whole body, is put into a sweat, which, after bleeding, either carries off or lessens the inflammation. When the disease takes a tendency to suppuration, nothing will be more useful than the taking into the fauces the steams of warm water. When the abscess is attended with much swelling, if it break not spontaneously, it ought to be opened by a lancet; and this does not require much caution, as

even the inflammatory state may be relieved by some scarification of the tonsils. Dr Cullen has never seen any case requiring bronchotomy.

XXXVI. The malignant, putrid, or ulcerous SORE 286 THROAT, Sp. II.

Cynanche maligna, *Sauv. sp. 3.*

Cynanche ulcerosa, *Sauv. var. a. Journ. de Med. 1758.*

Cynanche gangrenosa, *Sauv. var. b. Journ. de Med. 1756.*

Ulcers faucium et gutturis anginosa et lethalia, Hispanis *Garratillo, Lud. Mercat. consult. 24.*

Angina ulcerosa, *Fothergill's Account of the ulcerous sore throat, edit. 1751. Huxham on the malignant ulcerous sore throat, from 1751 to 1753.*

Febris epidemica cum angina ulcusculosa, *Douglas's Practical History, Bolton 1736.*

Angina epidemica, *Ruffel, Oecon. Natur. p. 105.*

Angina gangrenosa, *Withering's Dissert. Inaug. Edinb. 1766.*

Angina ulcusculosa, *Bard's Inquiry, New-York 1771.*

Angina maligna, *Johnstone on the malignant Angina, Worcester 1779.*

*History and description.* This distemper is not particularly described by the ancient physicians; though perhaps the Syrian and Egyptian ulcers mentioned by Aretæus Cappadox, and the pestilent ulcerated tonsils we read of in Aëtius Amiderus, were of this nature. Some of the scarlet fevers mentioned by Morton seem also to have approached near to it. In the beginning of the last century, a disease exactly similar to this is described by the physicians of that time, as raging with great violence and mortality in Spain and some parts of Italy; but no account of it was published in this country till the year 1748, when a very accurate one was drawn up by Dr Fothergill, and in 1752 by Dr Huxham. The latter observes, that this disease was preceded by long, cold, and wet seasons; by which probably the bodies of people were debilitated, and more apt to receive contagion, which possibly also might be produced by the stagnant and putrid waters.

The attack of this disease was very different in different persons. Sometimes a rigor, with fulness and soreness of the throat, and painful stiffness of the neck, were the first symptoms complained of. Sometimes alternate chills and heats, with some degree of giddiness, drowsiness, or head-ach, ushered in the distemper. It seized others with much more feverish symptoms; great pain of the head, back, and limbs; a vast oppression of the præcordia, and continual sighing. Some grown persons went about for some days in a drooping state, with much uneasiness and anxiety, till at last they were obliged to take to their beds. —Thus various was the disease, says our author, at the onset. But it commonly began with chills and heats, load and pain of the head, soreness of throat, and hoarseness; some cough, sickness at stomach, frequent vomiting and purging, in children especially, which were sometimes very severe; though a contrary state was more common to the adult. There was in all a very great dejection of spirits,

spirits, very sudden weakness, great heaviness on the breast, and faintness, from the very beginning. The pulse in general was quick, small, and fluttering, though sometimes heavy and undulating. The urine was commonly pale, thin, and crude; however, in many grown persons, it was passed in small quantities, and high-coloured, or like turbid whey. The eyes were heavy, reddish, and as it were weeping; the countenance very often full, flushed, and bloated, though sometimes pale, and sunk.

How slight soever the disorder might appear in the day-time, at night the symptoms became greatly aggravated, and the feverish habit very much increased, nay, sometimes a delirium came on the very first night; and this exacerbation constantly returned through the whole course of the disease. Indeed, when it was considerably on the decline, our author says he has been often pretty much surprised to find his patient had passed the whole night in a phrenzy, whom he had left tolerably cool and sedate in the day.

Some few hours after the seizure, and sometimes contemporaneous with it, a swelling and soreness of the throat was perceived, and the tonsils became very tumid and inflamed, and many times the parotid and maxillary glands swelled very much, and very suddenly, even at the very beginning; sometimes so much as even to threaten strangulation. The fauces also very soon appeared of a high florid red, or rather of a bright crimson, colour, very shining and glossy; and most commonly on the uvula, tonsils, velum palatinum, and back part of the pharynx, several whitish or ash-coloured spots appeared scattered up and down, which oftentimes increased very fast, and soon covered one or both the tonsils, uvula, &c. those in the event proved sloughs of superficial ulcers, (which sometimes, however, eat very deep into the parts). The tongue at this time, though only white and moist at the top, was very foul at the root, and covered with a thick yellowish or brown coat. The breath also now began to be very nauseous; which offensive smell increased hourly, and in some became at length intolerable, and that too sometimes even to the patients themselves.

The second or third day every symptom became much more aggravated, and the fever much more considerable; and those that had struggled with it tolerably well for thirty or forty hours, were forced to submit. The restlessness and anxiety greatly increased, as well as the difficulty in swallowing. The head was very giddy, pained, and loaded; there was generally more or less of a delirium; sometimes a pervigilium and perpetual phrenzy, though others lay very stupid, but often starting and muttering to themselves. The skin was very hot, dry, and rough; there was very rarely any disposition to sweat. The urine was pale, thin, crude; often yellowish and turbid. Sometimes a vomiting was urgent, and sometimes a very great looseness, in children particularly. The sloughs were now much enlarged, and of a darker colour, and the surrounding parts tended much more to a livid hue. The breathing became much more difficult; with a kind of a rattling sterter, as if the patient was actually strangling, the voice being exceeding hoarse and hollow, exactly resembling that from venereal ulcers in the fauces: this noise in

speaking and breathing was so peculiar, that any person in the least conversant with the disease might easily know it by this odd noise; from whence indeed the Spanish physicians gave it the name of *garotillo*, expressing the noise such make as are strangling with a rope. Our author never observed in one of them the shrill, barking noise, that we frequently hear in inflammatory quinities. The breath of all the diseased was very nauseous; of some insufferably fetid, especially in the advance of the distemper to a crisis; and many about the fourth or fifth day spit off a vast quantity of sinking, purulent mucus, tinged sometimes with blood; and sometimes the matter was quite livid, and of an abominable smell. The nostrils likewise in many were greatly inflamed and excoriated, continually dripping down a most sharp ichor, or sanious matter, so excessively acrid, that it not only corroded the lips, cheeks, and hands of the children that laboured under the disease, but even the fingers and arms of the very nurses that attended them: as this ulceration of the nostrils came on, it commonly caused an almost incessant sneezing in the children; but few adults were affected with it, at least to any considerable degree. It was surprising what quantities of matter some children discharged this way, which they would often rub on their face, hands, and arms, and blister them all over. A sudden stoppage of this rheum from the mouth and nostrils actually choked several children; and some swallowed such quantities of it, as occasioned excoriations of the intestines, violent gripings, dysentery, &c. nay, even excoriations of the anus and buttocks. Not only the nostrils, fauces, &c. were greatly affected by this extremely sharp matter, but the wind-pipe itself was sometimes much corroded by it, and pieces of its internal membrane were spit up, with much blood and corruption; and the patients lingered on for a considerable time, and at length died tabid; though there were more frequent instances of its falling suddenly and violently on the lungs, and killing in a peripneumonic manner.

The Doctor was astonished sometimes to see several swallow with tolerable ease, though the tumour of the tonsils and throat, the quantity of thick mucus, and the rattling noise in breathing, were very terrible; which he thinks pretty clearly shews, that this malignant quinzy was more from the acrimony and abundance of the humors than the violence of the inflammation.

Most commonly the angina came on before the exanthemata; but many times the cuticular eruption appeared before the fore-throat, and was sometimes very considerable, though there was little or no pain in the fauces: on the contrary, a very severe angina seized some patients, that had no manner of eruption; and yet, even in these cases, a very great itching and desquamation of the skin sometimes ensued; but this was chiefly in grown persons, very rarely in children. In general, however, a very considerable efflorescence broke out on the surface of the body, particularly in children; and it most commonly happened the second, third, or fourth day: sometimes it was partial, sometimes it covered almost the whole body, though very seldom the face: sometimes it was of an erysipellatous kind; sometimes more pustular: the pustules frequently very eminent, and of a deep, fiery, red colour,



PRACTICE colour, particularly on the breast and arms; but oftentimes they were very small, and might be better felt than seen, and gave a very odd kind of roughness to the skin. The colour of the efflorescence was commonly of a crimson hue, or as if the skin had been smeared over with juice of raspberries, and this even to the fingers ends; and the skin appeared inflamed and swollen, as it were; the arms, hands, and fingers, were often evidently so, and very stiff, and somewhat painful. This crimson colour of the skin seemed indeed peculiar to this disease. Though the eruption seldom failed of giving some manifest relief to the patient, as to anxiety, sickness at stomach, vomiting, purging, &c. yet there was observed an universal fiery eruption on some persons, without the least abatement of the symptoms, nay, almost every symptom seemed more aggravated, particularly the fever, load at breast, anxiety, delirium; and our author knew more than one or two patients die in the most raging phrenzy, covered with the most universal fiery rash he ever saw: so that, as in the highly confluent small pox, it seemed only to denote the quantity of the disease, as he terms it.

He had under his care a young gentleman, about twelve years of age, whose tongue, fauces, and tonsils, were as black as ink, and he swallowed with extreme difficulty; he continually spit off immense quantities of a black, sanious, and very fetid matter, for at least eight or ten days:—about the seventh day, his fever being somewhat abated, he fell into a bloody dysentery, though the bloody, sanious, fetid expectoration still continued, with a most violent cough. He at length indeed got over it, to the very great surprise of every one that saw him. Now, in this patient, a severe and universal rash broke out upon him the second and third day; and the itching of his skin was so intolerable, that he tore it all over his body in a most shocking manner: yet this very great and timely eruption very little relieved his fever and phrenzy, or prevented the other dreadful symptoms mentioned.

An early and kindly eruption, however, was most commonly a very good omen; and, when succeeded by a very copious desquamation of the cuticle, one of the most favourable symptoms that occurred; but when the eruption turned of a dusky or livid colour, or prematurely or suddenly receded, every symptom grew worse, and the utmost danger impended, especially if purple, or black, spots appeared up and down, as sometimes happened; the urine grew limpid, and convulsions came on, or a fatal suffocation soon closed the tragedy.

The disease was generally at the height about the fifth or sixth day in young persons, in the elder not so soon; and the crisis many times was not till the eleventh or twelfth, and then very imperfect: some adults, however, were carried off in two or three days; the distemper either falling on the lungs, and killing in a peripneumonic manner, or on the brain; and the patient either died raving or comatose. In some, the disease brought on a very troublesome *catarrhus*, purulent expectoration, hæmoptoe, and hæctic; in which they lingered on for several weeks, and then died tabid.

If a gentle easy sweat came on the third or fourth day; if the pulse became more slow, firm, and equal;

if the sloughs of the fauces cast off in a kindly manner, and appeared at the bottom tolerably clean and florid; if the breathing was more soft and free, and some degree of vigour and quickness returned in the eyes; all was well, and a salutary crisis followed soon by a continuance of the sweat, and a turbid, subiding, farinaceous urine, a plentiful expectoration, and a very large desquamation of the cuticle. But if a rigor come on, and the exanthemata suddenly disappeared or turned livid; if the pulse grew very small and quick, and the skin remained hot and parched as it were, the breathing more difficult, the eyes dead and glassy, the urine pale and limpid, a phrenzy or coma succeeded, with a coldish clammy sweat on the face or extremities; life was despaired of; especially if a singultus and choaking or gulping in the throat, attended with sudden, liquid, involuntary, livid stools, intolerably fetid. In some few patients our author observed, some time before the fatal period, not only the face bloated, fallow, shining, and greasy as it were, but the whole neck vastly swollen, and of a cadaverous look; and even the whole body became in some degree œdematous; and the impression of a finger would remain fixed in a part, the skin not rising again as usual; an indication that the blood stagnated in the capillaries, and that the elasticity of the fibres was quite lost.

*Prognosis.* This may be easily gathered from the above description. The malignant and putrid tendency of the disease is evident, and an increase of the symptoms which arise from that putrescent disposition of the body must give an unfavourable prognosis; as, on the contrary, a decrease of these, and an apparent increase of the *vis vitæ*, are favourable: in general, what is observed to be favourable in the nervous and putrid malignant fevers, is also favourable in this, and *vice versa*.

*Cure.* In this the septic tendency of the disease is chiefly to be kept in view. The debility with which it is attended renders all evacuations by bleeding and purging improper, except in a few instances where the debility is less, and the inflammatory symptoms more considerable. The fauces are to be preserved from the effects of the acrid matter poured out upon them, and are therefore to be frequently washed out by antiseptic gargles or injections; and the putrescent state of the whole system should be guarded against and corrected by internal antiseptics, especially by the Peruvian bark given in the beginning and continued through the course of the disease. Emetics, both by vomiting and nauseating, prove useful. When any considerable tumour occurs, blisters applied externally will be of service, and in any case may be proper to moderate the inflammation.

XXXVII. *Cynanche TRACHEALIS*, commonly called the Croup. Sp. III.

*Cynanche trachealis*, *Sauv.* sp. 5.

*Cynanche laryngea auctorum*, *Eller* de cogn. et curand. morb. sect. 7.

*Anginae inflammatorie* sp. 1. *Boerh.* 801.

*Angina latens et difficilis*, *Dodon.* obs. 18.

*Angina interna*, *Tulp.* l. 1. obs. 51.

*Angina perniciofa*, *Greg.* *Horsl.* Obs. I. iii. obs. 1.

*Suffocatio tridula*, *Horne* on the Croup.

*Asthma infantum*, *Millar* on the Asthma and Chincough.

*Asthma infantum spasmodicum*, *Rust,* Dissertation, Lon.

- London 1770.  
 Cynanche stridula, *Crawford* Dissert. Inaug. Edin. 1771.  
 Angina epidemica anno 1743. *Molloy* apud *Rutty's* History of the weather.  
 Morbus strangulatorius, *Starr*, Phil. Transf. n° 495.  
 Morbus trucleus infantum, *Francof.* ad Viadrum et in vicinia graffias ann. 1758. C. a Bergen. A nova. N. C. tom. ii. p. 157.  
 Catarrhus suffocatus *Barbadoensis* ann. 1758. *Hillary's* Dileases of Barbadoes.  
 Angina inflammatoria infantum, *Russel*, Oecon. nat. p. 70.  
 Angina polyposa five membranacea *Michaelis*, Argentorati 1778, et auctores ab eo allegati.

The best description of this disease we have in Dr Cullen's Practice of Physic. He informs us, that it consists in an inflammation of the glottis, larynx, or upper part of the trachea, whether it affect the membranes of these parts or the muscles adjoining. It may arise first in these parts, and continue to subsist in them alone; or it may come to affect these parts from the cynanche tonsillaris, or maligna, spreading into them.

In either way it has been a rare occurrence, and few instances of it have been marked and recorded by physicians. It is to be known by a peculiar croaking sound of the voice, by difficult respiration, with a sense of straitening about the larynx, and by a pyrexia attending it.

From the nature of these symptoms, and from the dissection of the bodies of persons who died of this disease, there is no doubt of its being of an inflammatory kind. It does not, however, always run the course of inflammatory affections; but frequently produces such an obstruction of the passage of the air, as suffocates, and thereby proves suddenly fatal.

If we judge rightly of the nature of this disease, it will be obvious, that the cure of it requires the most powerful remedies of inflammation to be employed upon the very first appearance of the symptoms. When a suffocation is threatened, whether any remedies can be employed to prevent it, we have not had experience to determine.

The accounts which books have hitherto given us of inflammations of the larynx, and the parts connected with it, amount to what we have now said; and the instances recorded have, almost all of them, happened in adult persons: but there is a peculiar affection of this kind happening to infants, which has been little taken notice of till lately. Dr Home is the first who has given any distinct account of this disease; but, since he wrote, several other authors have taken notice of it, and have given different opinions concerning it.

This disease seldom attacks infants till after they have been weaned. After this period, the younger they are, the more they are liable to the disease. The frequency of it becomes less as children become more advanced; and there are no instances of children above 12 years of age being affected with it. It attacks children of the midland countries, as well as those who live near the sea. It does not appear to be contagious, and its attacks are frequently repeated in the same child. It is often manifestly the effect of cold

applied to the body; and therefore appears most frequently in the winter and spring seasons. It very commonly comes on with the ordinary symptoms of a catarrh; but sometimes the peculiar symptoms of the disease shew themselves at the very first.

These peculiar symptoms are the following: A hoarseness, with some shrillness and ringing sound, both in speaking and coughing, as if the noise came from a brazen tube. At the same time, there is a sense of pain about the larynx, some difficulty of respiration, with a whizzing sound in inspiration, as if the passage of the air were straitened. The cough which attends it, is commonly dry; and if any thing be spit up, it is a matter of a purulent appearance, and sometimes films resembling portions of a membrane. With all these symptoms, there is a frequency of pulse, a restlessness, and an uneasy sense of heat. When the internal fauces are viewed, they are sometimes without any appearance of inflammation; but frequently a redness, and even swelling, appears; and sometimes there is an appearance of matter like to that rejected by coughing, together with the symptoms now described, and particularly with great difficulty of breathing, and a sense of strangling in the fauces, by which the patient is sometimes suddenly taken off.

Many dissections have been made of infants who had died of this disease, and almost constantly there has appeared a preternatural membrane lining the whole internal surface of the upper part of the trachea, and extending in the same manner downwards into some of its ramifications. This preternatural membrane may be easily separated, and sometimes has been found separated in part, from the subjacent proper membrane of the trachea. This last is commonly found entire, that is, without any appearance of erosion or ulceration; but it frequently shows the vestiges of inflammation, and is covered by a matter resembling pus, like to that rejected by coughing; and very often a matter of the same kind is found in the bronchiae, sometimes in considerable quantity.

From the remote causes of this disease; from the catarrhal symptoms commonly attending it; from the pyrexia constantly present with it; from the same kind of preternatural membrane being found in the trachea when the cynanche maligna is communicated to it; and from the vestiges of inflammation on the trachea discovered upon dissection; we must conclude, that this disease consists in an inflammatory affection of the mucous membrane of the larynx and trachea, producing an exudation analogous to that found on the surface of inflamed viscera, and appearing partly in a membranous crust, and partly in a fluid resembling pus.

Though this disease consists in an inflammatory affection, it does not commonly end either in suppuration or gangrene. The troublesome circumstance of it seems to consist in a spasm of the muscles of the glottis, threatening suffocation.

When this disease terminates in health, it is by resolution of the inflammation, by a sealing of the spasm of the glottis, by an expectoration of the matter exuding from the trachea, and of the crusts formed there, and frequently it ends without any expectoration, or at least with such only as attends an ordinary catarrh.

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When the disease ends fatally, it is by a suffocation seemingly depending upon a spasm affecting the glottis; but sometimes, probably, depending upon a quantity of matter filling the bronchie.

As we suppose the disease to be an inflammatory affection, so we attempt the cure of it by the usual remedies of inflammation, and which for the most part we have found effectual. Bleeding, both general and topical, has often given immediate relief, and, by being repeated, has entirely cured the disease. Blistering also, near to the part affected, has been found useful. Upon the first attack of the disease, vomiting, immediately after bleeding, seems to be of considerable use, and sometimes suddenly removes the disease. In every stage of the disease, the antiphlogistic regimen is necessary, and particularly the frequent use of laxative glysters. Tho' we suppose that a spasm affecting the glottis is often fatal in this disease, we have not found antispasmodic medicines to be of any use.

287 XXXVIII. *Cynanche PHARYNGEA.* Sp. IV.

*Cynanche pharyngea*, *Sauv.* sp. 6. *Eller de cogn. et cur. sect. 7.*

*Anginæ inflammatoriz* sp. 4. *Boerb.* 804.

This is not materially different from the *cynanche tonsillaris*; only that the inflammation is said to begin in the pharynx, though *Dr Cullen* says he never knew an instance of it. The symptoms are almost the same, and the cure is precisely so with that of the *cynanche tonsillaris*.

288 XXXIX. *Cynanche PAROTIDÆA.* Sp. V.

*Cynanche parotidæa*, *Sauv.* sp. 14. *Gallis OREILLONS et OURLES, Tissot Avis au peuple, n° 116. Encyclopedie, au mot Oreillons.*

*Angina externa*, *Anglis* the MUMPS, *Russell æcon. natur.* p. 114. *Scottis* the BRANKS.

*Catarrhus bellinifularis*, *Sauv.* sp. 4.

Osservazioni di *Girol. Gaspari*, *Venez.* 1731.

Osservazioni di *Targ. Tozzetti*, *Racolta 1ma*, p. 176.

This is a disease well known to the vulgar, but little taken notice of by medical writers. It is often epidemic, and manifestly contagious. It comes on with the usual symptoms of pyrexia, which is soon after attended with a considerable tumour of the external fauces and neck. The swelling appears first as a glandular movable tumour at the corner of the lower jaw; but it soon becomes uniformly diffused over a great part of the neck, sometimes on one side only, but more commonly on both. The swelling continues to increase till the fourth day; but from that period it declines, and in a few days more goes off entirely. As the swelling of the fauces recedes, some tumour affects the testicles in the male sex, or the breasts in the female. These tumours are sometimes large, hard, and somewhat painful; but are seldom either very painful, or of long continuance. The pyrexia attending this disease is commonly slight, and goes off with the swelling of the fauces; but sometimes, when the swelling of the testicles does not succeed to that of the fauces, or when the one or the other has been suddenly repressed, the pyrexia becomes more considerable, is often attended with delirium, and has sometimes proved fatal.

As this disease commonly runs its course without either dangerous or troublesome symptoms, so it hardly

requires any remedies. An antiphlogistic regimen, and avoiding cold, are all that will be commonly necessary. But when, upon the receding of the swellings, the pyrexia comes to be considerable, and threatens an affection of the brain, it will be proper, by warm fomentations, to bring back the swelling; and by vomiting, bleeding, or blistering, to obviate the consequences of its absence.

GENUS XL. PNEUMONIA.

*Febris pneumonica*, *Hoffm.* II. 136.

XLI. PERIPNEUMONIA, *Peripneumony*, or Inflammation of the Lungs. Sp. I.

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*Peripneumonia*, *Sauv.* gen. 112. *Lin.* 34. *Vog.*

51. *Sag.* gen. 311. *Boerb.* 820. *Juncker* 67.

*Peripneumonia pura five vera* *Auctorum*, *Sauv.* sp. 1.

*Peripneumonia gastrica*, *Sauv.* sp. 11. *Morgagn.*

de caus. et fed. *Epist.* xx. art. 30; 31.

*Peripneumonia catarrhalis*, *Sauv.* sp. 6.

*Peripneumonia notha*, *Sydenh.* sect. 6. cap. 4.

*Boerb.* 867. *Morgagni* de caus. et fed. *Epist.*

xxi. 11.—15.

*Peripneumonia putrida*, *Sauv.* sp. 2.

*Peripneumonia ardens*, *Sauv.* sp. 3.

*Peripneumonia maligna*, *Sauv.* sp. 4.

*Peripneumonia typhodes*, *Sauv.* sp. 5.

*Amphimeria peripneumonia*, *Sauv.* sp. 15.

XLII. PLEURITIS, the *Pleurisy*, or Inflammation of the Pleura. Sp. II.

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*Pleuritis*, *Sauv.* gen. 103. *Lin.* 27. *Vog.* 56. *Sag.*

gen. 303. *Boerb.* 875. *Junck.* 67.

*Paraphrenesis*, *Sauv.* gen. 102. *Lin.* 26.

*Paraphrenitis*, *Vog.* 55. *Boerb.* 907.

*Diaphragmitis*, *Sag.* gen. 304.

*Pleuritis vera*, *Sauv.* sp. 1. *Boerb.* 875. *Verna*

principes morb. acut. *pleuritis*, l. 1. cap. 2. 3.

*Zeviani* della parapleuritide, cap. 3. *Morgag.*

de fed. et caus. morb. *Epist.* xx. art. 56. xxi. 45.

*Wendt* de pleuritide, apud *Sandifort*, thes. ii.

*Pleuritis pulmonis*, *Sauv.* sp. 2. *Zevian.* dell. para-

pleur. iii. 28; &c.

*Pleuripneumonia*, *pleuro-peripneumonia*, *peripneu-*

*monia* *Auctorum*. *Baronius* de pleuri-pneu-

*monia*. III. *Halleri* opuscul. patholog. obs. 13.

*Morgagn.* de fed. et caus. *Epist.* xx. et xxi. *pals-*

*horn.* *Cleghorn*, *Minorca*, p. 247. *Triller* de pleuri-

*tide*, aph. 1, 2, 3. cap. i. 8. *Huxham*, *Disert.* on

*pleuritis*, &c. chap. i. III. *Pringle*, *Dis.* of the

*army*.

*Pleuritis convulsiv.* *Sauv.* sp. 13. *Bianch.* *Hist.* hep.

vol. i. p. 234.

*Pleuritis hydrothoracica*, *Sauv.* sp. 15. *Morgag.* de

caus. et fed. xx. 34.

*Pleuritis dorsalis*, *Sauv.* sp. 3. *Verna*, p. iii. cap. 8.

*Pleuritis mediastini*, *Sauv.* sp. 3. *P. Sal. Div.* de

æfect. part. cap. 6. *Friend*, *Hist.* med. de *Aven-*

*zoare*.

*Pleuritis mediastina*, *Vog.* 52.

*Pleuritis pericardii*, *Sauv.* sp. 5. *Verna*, p. iii.

cap. 9.

*Parapleuritis*, *Zeviani* della parapleuritide.

*Pleurodyne* *parapleuritis*, *Sauv.* sp. 19.

*Paraphrenesis* *diaphragmatica*, *Sauv.* sp. 1. *De*

*Haen.* *Rat. med.* i. 7. iii. p. 31.



*Paraphrensis pleuritica, Sauv. sp. 2.*

*Paraphrensis hepatica, Sauv. sp. 3.*

Under the general head of *Pneumonia*, Dr. Cullen comprehends all inflammations of the thoracic viscera, or membrane lining the inside of that cavity; as the symptoms do not sufficiently distinguish the seat of the affection, nor does a difference in the situation of the affected place make any difference in the cure.

*Description.* Pneumonic inflammation, however various in the seat, always discovers itself by pyrexia, difficult breathing, cough, and pain in some part of the thorax. It almost always comes on with a cold stage, and is accompanied with the other symptoms of pyrexia; though in some few instances the pulse may not be more frequent, nor the heat of the body increased beyond what is natural. Sometimes the pyrexia is from the beginning accompanied with the other symptoms; but frequently is formed some hours before them, and particularly before the pain is felt. The pulse for the most part is frequent, full, strong, hard, and quick; but in a few instances, especially in the advanced state of the disease, it is weak, soft, and at the same time irregular. The difficulty of breathing is most considerable in inspiration, both because the lungs do not easily admit of a full dilatation, and because the dilatation increases the pain attending the disease. The difficulty of breathing is also greater when the patient is in one posture of the body rather than another. It is generally greater when he lies on the side affected; though sometimes the contrary happens. Very often the patient cannot lie easy upon either side, and can find ease only when lying on the back; and sometimes he cannot breathe easily, except when in somewhat of an erect posture. The cough, in different cases, is more or less urgent or painful. It is sometimes dry, or without any expectoration, especially in the beginning of the disease; but more commonly it is, even from the first, moist, and the matter spit up various both in consistence and colour, and frequently it is streaked with blood. The pain is also different in different cases, and felt in different parts of the thorax, but most frequently in one side. It has been said to affect the right side more frequently than the left; but this is uncertain, and we are sure that the left side has been very often affected. Sometimes it is felt as if it was under the sternum; sometimes in the back between the shoulders; and when in the sides, its place has been higher or lower, more forward or backward; but the place of all others most frequently affected is about the sixth or seventh rib, near the middle of its length, or a little more forward. The pain is often severe and pungent; but sometimes more dull and obtuse, with a sense of weight rather than of pain. It is most especially severe and pungent, when occupying the place last mentioned. For the most part it continues fixed in one part, but sometimes shoots from the side to the scapula on one hand, or to the sternum and clavicle of the other.

Dr. Cullen supposes that the disease is always seated, or at least begins, in some part of the pleura, taking that membrane in its greatest extent, as now commonly understood; that is, as covering not only the internal surface of the cavity of the thorax, but also as forming the mediastinum, and as extended over the pericardium, and over the whole surface of the

lungs. But as the symptoms never clearly indicate where the seat of the disease is, there is but little foundation for the different names by which it hath been distinguished. The term *pleurisy* is improperly limited to that inflammation which begins in and chiefly affects the pleura costalis. This our author thinks is a rare occurrence; and that the pneumonia much more frequently begins in the pleura investing the lungs, producing all the symptoms which belong to what hath been called the *pleuritis vera*. The word *peripneumony* hath been applied to an inflammation beginning in the parenchyma, or cellular texture of the lungs, and having its seat chiefly there. But to our author it seems very doubtful if any acute inflammation of the lungs, or any disease which hath been called *peripneumony*, be of that kind. It seems probable, that every acute inflammation begins in membranous parts; and in every dissection of persons dead of peripneumony, the external membrane of the lungs, or some part of the pleura, has appeared to have been considerably affected. An inflammation of the pleura covering the upper surface of the diaphragm, has been distinguished by the appellation of *paraphrenitis*, as supposed to be attended with the peculiar symptoms of delirium, *risus sardoniacus*, and other convulsive motions; but it is certain, that an inflammation of that portion of the pleura, and affecting also even the muscular substance of the diaphragm, has often taken place without any of the symptoms above mentioned; and neither the dissections which have fallen under our author's observation, nor any accounts of dissections, support the opinion that an inflammation of the pleura covering the diaphragm is attended with delirium more commonly than any other pneumonic inflammation. It is to be observed, however, that though the inflammation may begin in one particular part of the pleura, the morbid affection is commonly communicated to the whole extent of the membrane.

The pneumonic inflammation, like others, may terminate by resolution, suppuration, or gangrene: but it has also a termination peculiar to itself; namely, when it is attended with an effusion of blood into the cellular texture of the lungs, which, soon interrupting the circulation of the blood through the vessels, produces a fatal suffocation. This indeed appears to be the most common termination of pneumonic inflammation when it ends fatally; for upon the dissection of almost every person dead of this disease, it appears that such an effusion had happened. From the same dissections we learn, that pneumonic inflammation commonly produces an exudation from the internal surface of the pleura, which appears partly as a soft viscid crust, often of a compact membranous form covering every where the surface of the pleura, and particularly those parts where the lungs adhere to the pleura costalis, or mediastinum; and this crust seems always to be the cement of such adhesion. The same exudation shews itself also by a quantity of a serous fluid commonly found in the cavity of the thorax; and some exudation or effusion is usually found to have been made into the cavity of the pericardium. It seems likewise probable, that an effusion of this kind is sometimes made into the cavity of the bronchiae; for, in some persons who have died after labouring under a pneumonic inflammation for a few days only,

the bronchiæ have been found filled with a considerable quantity of serous and thickish fluid, which must be considered rather as the effusion abovementioned, having had its thinner parts taken off by respiration, than as a pus so suddenly formed in the inflamed part. It is, however, not improbable, that this effusion, as well as that made into the cavities of the thorax and pericardium, may be a matter of the same kind with that which in other inflammations is poured into the cellular texture of the parts inflamed, and there converted into pus; but in the thorax and pericardium it does not always put on this appearance, because the crust covering the surface prevents the absorption of the thinner part. This absorption, however, may be compensated in the bronchiæ, by the drying power of the air; and therefore the effusion into them may assume a more purulent appearance. In many cases of pneumonic inflammation, when the expectoration is very copious, it is difficult to suppose that the whole proceeds from the mucous follicles of the bronchiæ, and it seems probable that a great part of it may come from the effused serous fluid just mentioned; and this too will account for the appearance of the expectoration being so often purulent. Perhaps the same thing will account for that purulent matter found in the bronchiæ, which Mr de Haen says he had often observed when there was no ulceration in the lungs, and which he accounts for in a very strange manner, namely, by supposing a pus formed in the circulating blood.

Dr Cullen is of opinion, that the effusion into the bronchiæ above-mentioned often concurs with the effusion of red blood into the cellular substance of the lungs to occasion the fatal suffocation which frequently terminates peripneumony: that the effusion of serum alone may have this effect: and that the serum poured out in a certain quantity, rather than any debility in the powers of expectoration, is the cause of that cessation of spitting which precedes the fatal event; for in many cases the expectoration has ceased, when no other symptoms of debility have appeared, and when, upon dissection, the bronchiæ have been full of liquid matter. Nay, it is even probable, that in some cases such an effusion may take place without any symptoms of violent inflammation; and in other cases the effusion taking place may seem to remove the symptoms of inflammation which had appeared before, and thus account for those unexpected fatal terminations which have sometimes happened.

Pneumonic inflammation seldom terminates by resolution, without being attended with some evident evacuation. An hæmorrhage from the nose happening on some of the first days of the disease has sometimes put an end to it; and it is said, that an evacuation from the hæmorrhoidal veins, a bilious evacuation by stool, and an evacuation of urine with a copious sediment, have severally had the same effect; but such occurrences have been rare. The evacuation most frequently attending, and seeming to have the greatest effect in promoting resolution, is an expectoration of a thick, white, or yellowish matter, a little streaked with blood, copious, and brought up without much or violent coughing. Very frequently the resolution of this disease is attended with, and perhaps produced by, a sweat which is warm, fluid, copious, over the whole body,

and attended with an abatement of the frequency of the pulse, heat of the body, and other febrile symptoms.

*Causes of, and persons subject to, the disorder.* The remote cause of pneumonic inflammation is commonly cold applied to the body, obstructing perspiration, and determining to the lungs, while at the same time the lungs themselves are exposed to the action of cold. These circumstances operate chiefly when an inflammatory diathesis prevails in the system; and therefore upon persons of the greatest vigour, in cold climates, in the winter season, and particularly in the spring, when vicissitudes of heat and cold are frequent. This disease, however, may arise in any season when such varieties take place. Other remote causes also may have a share in producing this distemper; such as every means of obstructing, straining, or otherwise injuring, the pneumonic organs. The pneumonic inflammation has sometimes been so much an epidemic, that it hath been suspected of depending on a specific contagion; but Dr Cullen never met with an instance of its being contagious.

*Prognosis.* In pneumonic inflammations, a violent pyrexia is always dangerous. The danger, however, is chiefly denoted by the difficulty of breathing. When the patient can lie on one side only; when he can lie on neither side, but only on his back; when he cannot breathe with tolerable ease, except when the trunk of his body is erect; when even in this posture the breathing is very difficult, and attended with a turgescence and flushing of the face, with partial sweats about the head and neck, and an irregular pulse, these circumstances mark the difficulty of breathing in different degrees; and consequently, in proportion, the danger of the disease. A frequent violent cough, aggravating the pain, is always the symptom of an obstinate disease; and as the disease is seldom or never resolved without some expectoration, so a dry cough must always be an unfavorable symptom.

The proper characteristics of the expectoration have been already laid down; and though an expectoration which hath not these marks must indicate a doubtful state of the disease, yet the colour alone can give no certain prognostic. An acute pain, very much interrupting inspiration, is always the mark of a violent disease; but not of a more dangerous disease than an obtuse pain attended with very difficult respiration.

When the pains, which had at first affected one side only, shall afterwards spread into the other; or when, leaving the side first affected, they pass entirely into the other; these are always marks of a dangerous disease. A delirium coming on during a pneumonic inflammation is always a symptom denoting much danger.

When pneumonic disorders terminate fatally, it is on one or other of the days of the first week, from the third to the seventh. This is the most common case; but, in a few instances, death has happened at a later period. When the disease is violent, but admitting of resolution, this also happens frequently in the course of the first week; but in a more moderate disease the resolution is often put off to the second week. The disease generally suffers a remission on some of the days from the third to the seventh: which, however, may be often fallacious, as the disease sometimes returns again with as much violence as before; and in such a

**PRACTICE** case with great danger. Sometimes it disappears on the third day, while an erysipelas makes its appearance on some external part; and if this continues fixed, the pneumonic inflammation does not recur. If the disease continues beyond the 14th day, it will terminate in a suppuration, or PHTHISIS. The termination by gangrene is much more rare than has been imagined; and when it does occur, it is usually joined with the termination by effusion; the symptoms of the one being hardly distinguishable from those of the other.

*Cure.* This must proceed upon the general plan mentioned under *SYNOCIA*; but, on account of the importance of the part affected, the remedies must be employed early, and as fully as possible. Venesection is chiefly to be depended on; and may be done in either arm, as the surgeon finds most convenient; and the quantity taken away ought in general to be as large as the patient's strength will allow. The remission of pain, and the relief of respiration, during the flowing of the blood, may limit the quantity to be then drawn; but if these symptoms of relief do not appear, the bleeding should be continued till the symptoms of a beginning syncope come on. It is seldom that one bleeding, however large, will cure this disease; and though the pain and difficulty of breathing may be much relieved by the first bleeding, these symptoms commonly and after no long interval recur, often with as much violence as before. In this case the bleeding is to be repeated even on the same day, and perhaps to the same quantity as before. Sometimes the second bleeding may be larger than the first. There are persons who, by their constitution, are ready to faint even upon a small bleeding; and in such persons this may prevent the drawing so much blood at first as a pneumonic inflammation may require; but as the same persons are found to bear after-bleedings better than the first, this allows the second and subsequent bleedings to be larger, and to such a quantity as the symptoms of the disease may seem to require.

Bleedings are to be repeated according to the state of the symptoms, and they will be more effectual when practised in the course of the first three days than afterwards; but they are not to be omitted though four days of the disease may already have elapsed. If the physician has not been called in time, or the first bleedings have not been sufficiently large, or even though they should have procured some remission, yet upon the return of the urgent symptoms, bleeding may be repeated at any time within the first fortnight, or even after that period, if a suppuration be not evident, or if after a seeming solution the disease shall have returned.

With respect to the quantity of blood which may be taken away with safety, no general rules can be given; as it must be very different according to the state of the disease, and the constitution of the patient. In an adult male of tolerable strength, a pound avoirdupois of blood is a full bleeding. Any quantity above 20 ounces is a large, and any quantity below 12 is a small, bleeding. An evacuation of four or five pounds, in the course of two or three days, is generally as much as such patients will bear; but if the intervals between the bleedings, and the whole of the time during which the bleedings have been employed, have been long, the quantity taken upon the whole may be greater.

When a large quantity of blood hath been taken

from the arm, and it is doubtful if more can be taken in that manner with safety, some blood may still be taken by cupping and scarifying. This will especially be proper, when the recurrence of the pain, rather than the difficulty of breathing, becomes the urgent symptom; and then the cupping and scarification should be made as near as possible to the pained part.

An expectoration sometimes takes place very early in this disease; but if the symptoms continue urgent, the bleedings must be repeated notwithstanding the expectoration: but in a more advanced state, and when the symptoms have suffered a considerable remission, we may then trust the cure to the expectoration alone. It is not observed that bleeding, during the first days of the disease, stops expectoration; on the contrary, it hath been often found to promote it; and it is only in a more advanced state of the disease, when the patient has been already exhausted by large evacuations and a continuance of his illness, that bleeding seems to put a stop to expectoration; and even then, this stoppage seems not to take place so much from the powers of expectoration being weakened by bleeding, as by its favouring the serous effusion in the bronchæ, already taken notice of.

Besides bleeding, every part of the antiphlogistic regimen ought here to be carefully employed: the patient must keep out of bed as much as he can bear; must have plenty of warm diluting drinks, impregnated with vegetable acids, accompanied with nitre or some other cooling neutral salt; and the belly also ought to be kept open by emollient glysters or cooling laxative medicines. Vomiting is dangerous; but it hath been found useful to exhibit emetics in nauseating doses, and in a somewhat advanced state of the disease these doses have been found the best means of promoting expectoration. Fomentations and poultices to the pained part have been found useful; but blistering is found to be much more effectual. A blister, however, ought not to be applied till at least one bleeding hath been premised, as venesection is less effectual when the irritation of a blister is present. If the disease is moderate, a blister may be applied immediately after the first bleeding; but in violent cases, where it may be presumed that a second bleeding may soon be necessary after the first, it will be proper to delay the blister till after the second bleeding, when it may be supposed that the irritation occasioned by the blister will be over before another bleeding becomes necessary. It may frequently be of use in this disease to repeat the blistering; and in that case the plasters should always be applied somewhere on the thorax, for when applied to more distant parts they have little effect. The keeping the blistered parts open, and making what is called a *perpetual blister*, has much less effect than a fresh blistering.

Many methods have been proposed for promoting expectoration, but none appear to be sufficiently effectual; and some of them, being acid stimulant substances, are not very safe. The gums usually employed seem to be too heating: the squills less so; but they are not very powerful, and sometimes inconvenient, by the constant nausea they occasion. The volatile alkali may be of service as an expectorant, but it ought to be referred for an advanced state of the disease. Mucilaginous and oily demulcents appear to



PRACTICE be useful, by allaying that acrimony of the mucus which occasions too frequent coughing; and which coughing prevents the stagnation and thickening of the mucus, and thereby its becoming mild. The receiving the steams of warm water into the lungs, impregnated with vinegar, has often proved useful in promoting expectoration; and, for this purpose, the machine called the *INHALER*, lately invented by Mr Mudge surgeon at Plymouth, promises to be of great service \*. But of all others, the antimonial emetics, given in nauseating doses, promise to be the most powerful for promoting expectoration. The kermes mineral hath been greatly recommended; but doth not seem to be more efficacious than emetic tartar or antimonial wine; and the dose of the kermes is much more uncertain than that of the others.

See Inhaler.

Though this disease often terminates by a spontaneous sweating, this evacuation ought not to be excited by art, unless with much caution. When, after some remission of the symptoms, spontaneous sweats arise, they may be encouraged; but it ought to be without much heat, and without stimulant medicines. If, however, the sweats be partial and clammy only, and a great difficulty of breathing still remain, it will be very dangerous to encourage them.

Physicians have differed much with regard to the use of opiates in pneumonic affections. It appears, however, that, in the beginning of the disease, and before bleeding and blistering have produced some remission of the pain and of the difficulty of breathing, opiates have a very bad tendency, by their increasing the difficulty of breathing and other inflammatory symptoms. But in a more advanced state of the disease, when the difficulty of breathing has abated, and when the urgent symptom is a cough, proving the chief cause of the continuance of pain and want of rest, opiates may be employed with great advantage and safety. The interruption of the expectoration which they seem to occasion, is for a short time only; and they seem often to promote it, as they occasion a stagnation of what was by frequent coughing diffipated insensibly: and therefore give the appearance of what physicians have called *consolidated matter*.

## 291 XLII. VOMICA, or Abscess of the Lungs.

Vomica, Boerh. 835. Junck. 35.

Pleurodyne vomica, Sauv. sp. 21.

This sometimes follows pneumonia, though the case is not frequent. The symptoms of it so much resemble the phthisis, that it can most properly be treated of under that head.

## 292 XLIII. EMPYEMA.

This is another consequence of a pneumonia terminating unfavourably, and is occasioned by the effusion of a quantity of purulent matter into the cavity of the thorax, occasioning a lingering and painful disorder, very often incurable.

*Description.* The first sign of an empyema is a cessation of the pain in the breast, which before was continual: this is followed by a sensation of weight on the diaphragm; and a fluctuation of matter, sometimes making a noise that may be heard by the bystanders: the acute fever is changed into a hectic, with an exacerbation at night: a continual and troublesome

dry cough remains. The respiration is exceedingly difficult, because the lungs are prevented by the matter from fully expanding themselves. The patient can lie easily on that side where the matter is effused, but not on the other, because then the weight of the matter on the mediastinum produces uneasiness. The more the hectic heat is augmented, the more is the body emaciated, and its strength decayed. In some there is danger of suffocation when they sleep down, which goes off when they alter that posture of the body; and in some there is a purulent spitting.—These symptoms are accompanied with great anxiety, palpitations of the heart, and faintings. Sometimes the patients have a sensation like a hot vapour ascending from the cavity of the thorax to their mouth. Others, in a more advanced state of the disease, have a putrid taste in the mouth. At the same time, profuse night-sweats waste the body, and greatly weaken the patients. The face at first grows red on that side where the matter lies, though sometimes there are only phlogoses; at last the Hippocratic face comes on, and the eyes become hollow. The pulse, especially on the affected side, is quick, but more frequently intermitting. Sometimes the nails are crooked, and pustules appear on the thorax; and frequently, according to the testimony of Hippocrates, the feet swell, and, on the affected side of the breast, there is an inflation and swelling of the skin.

*Cause, &c.* An empyema may arise either from the bursting of a vomica of the lungs, or from a suppuration taking place after the inflammatory stage of the pneumonia; or sometimes from a suppuration in the case of a quinsy, when the inflammation had extended to the aspera arteria, from whence arises a kind of bloody spittle, and the patients are afflicted with an empyema, unless they die on the 7th day of the disease, according to the observation of Hippocrates. It may arise also from external violence, as wounds of the thorax, &c. blood extravasated, corrupted, or changed with pus. Like the vomica, it is a rare dissemper, but may attack all those subject to pneumonia.

*Prognosis.* Very few recover after an empyema hath been once formed, especially if the operation of paracentesis hath been neglected. After this operation is performed, if a great quantity of bloody fetid pus is discharged, if the fever continues, and if the patient spits up a purulent, pale, frothy, livid, or green matter, with a decay of strength, there is no hope. But when a small quantity of pus, of a white colour, not very fetid, is discharged; when the fever and thirst presently cease, the appetite returns, and faeces of a good consistence are discharged, the strength also returning in some degree; there is then hope of a perfect recovery. If the matter is not dried up in seven weeks time, the disease readily changes to a fistulous ulcer, which is very difficult to cure. An empyema affecting both sides of the thorax, is more dangerous than that which affects only one.

*Cure.* This consists in evacuating the purulent matter contained in the cavity of the thorax, which is best done by the operation of paracentesis. See the article SURGERY. Afterwards the ulcer is to be treated with absorbent and consolidating medicines, and the same internal ones are to be given as in a

PHTHISIS.

XLIV. CARDITIS, or *Inflammation of the HEART.*  
Gen. XIII.

Carditis, *Sauv. gen.* 111. *Vog.* 54.  
Pericarditis, *Vog.* 53.  
Carditis spontanea, *Sauv. fp.* 1. *Senac. Traité de*  
*Cœur, lib. iv. chap. 7. Meckel, Mem. de Berlin,*  
*1756.*  
Erysipelas pulmonis, *Lomm. Observ. lib. ii.*

*Description.* This disease is attended with all the symptoms of pneumonia, but in a higher degree; it is besides said to be accompanied with hydrophobic symptoms, fainting, palpitation of the heart, a seeming madness, sunk and irregular pulse, watery eyes, and a dejected countenance, with a dry and black tongue. On dissection, the heart and pericardium are found very much inflamed, and even ulcerated, with many polypous concretions.

*Causes, &c.* The same as in the pneumonia.

*Prognosis.* In the carditis the prognosis is more unfavourable than in the pneumonia; and indeed, unless the disease very quickly terminates, it must prove fatal, on account of the constant and violent motion of the heart, which exasperates the inflammation, and increases all the symptoms.

*Cure.* Here bleeding is necessary in as great a degree as the patient can possibly bear, together with blistering, and the antiphlogistic regimen likewise carried to a greater height than in the pneumonia; but the general method is the same as in other inflammatory diseases.

GENUS XIV. PERITONITIS, or *Inflammation of the PERITONÆUM.*294 XLV. *Inflammation of the PERITONÆUM properly so called. Sp. I.*

Peritonitis, *Vog.* 62. *Lieutad. Hist. anat. med.*  
*lib. i. obs. 3. Raygerus apud eund. lib. i. obs. 341.*  
*Morgagn. de sed. LVII. 20.*

295 XLVI. *Inflammation of the PERITONÆUM extended over the Omentum. Sp. II.*

Epiplöitis, *Sauv. gen.* 106. *Sag. gen.* 308.  
Omentitis, *Vog.* 61.  
Omenti inflammatio, *Boerh. 958. et III. Van Swieten, Comm. Stork. An. Med. I. 132. Hulme on the puerperal fever.*

296 XLVII. *Inflammation of the PERITONÆUM stretched over the mesentery. Sp. III.*

Mesenteritis, *Vog.* 60.  
Enteritis mesenterica, *Sauv. fp.* 4.

GENUS XV. GASTRITIS, or *Inflammation of the STOMACH.*297 XLVIII. *The genuine GASTRITIS. A.*

Gastritis legitima, *Sauv. fp.* 1. *Ether. de cogn. et cur. morb. sect. xii. Haller, obs. 14. hist. 3.*  
*Lieut. Hist. anat. Med. lib. i. 74.*  
Gastritis erysipelatosa, *Sauv. fp.* 4.  
Cardialgia inflammatoria, *Sauv. fp.* 13. *Traller, de opio, sect. ii. p. 231.*

THESE diseases Dr Cullen hath thought proper to

consider all under the general head of GASTRITIS, as there are no certain signs by which they may be distinguished from each other, and the method of cure must be the same in all.

*Description.* The inflammation of the stomach is attended with great heat and pain in the epigastric region, extreme anxiety, an almost continual and painful hiccup, with a most painful vomiting of every thing taken into the stomach. Sometimes a temporary madness ensues; and there is an instance in the Edinburgh Medical Essays of the disorder being attended with an hydrophobia. The pulse is generally more sunk than in other inflammations, and the fever inclines to the nature of a typhus. The disorder is commonly of the remitting kind, and during the remissions the pulse frequently intermits. During the height of the disease, a mortal phrenzy frequently supervenes. The disease terminates on the fourth, seventh, ninth day, or from the eleventh to the fifteenth; and is more apt to end in a gangrene than pneumonic inflammations, and more frequently in a scirrhus than in an abscess.

*Causes, &c.* The inflammation of the stomach may arise from any acrid substance taken into it; from a vehement passion; too large draughts of cold liquor, especially when the person is very hot; from a surfeit; a stoppage of perspiration; repulsion of the gout; opiates; inflammations of the neighbouring viscera; or from external injuries, such as wounds, contusions, &c.—It affects chiefly those of a plethoric habit, and hot bilious constitution.

*Prognosis.* This disease is always very dangerous, and the prognosis doubtful, which also must always be in proportion to the severity of the symptoms. A cessation of pain, coldness about the præcordia, great debility, with a languid and intermitting pulse, with an abatement of the hiccup, denote a gangrene and speedy death. From the sensibility of the stomach also, and its great connection with the rest of the system, it must be obvious, that an inflammation of it, by whatever causes produced, may be attended with fatal consequences; particularly by the great debility it produces it may prove suddenly fatal, without running through the usual course of inflammations.—Its tendency to admit of resolution may be known by its having arisen from no violent cause, by the moderate state of the symptoms, and by a gradual remission of these symptoms in the course of the first or at most of the second week of the disease. The tendency to gangrene may be suspected from the symptoms continuing with unremitting violence notwithstanding the use of proper remedies, and a gangrene already begun may be known by the symptoms above-mentioned. The tendency to suppuration may be known by the symptoms continuing but in a moderate degree for more than one or two weeks, and by a considerable remission of the pain while a sense of weight and an anxiety still remain. When an abscess has been formed, the frequency of the pulse is at first abated; but soon after it increases with frequent cold shiverings, and an exacerbation in the afternoon and evening; followed by night-sweats, and other symptoms of hectic fever. These at length prove fatal, unless the abscess open into the cavity of the stomach, the

pus

PRACTICE pus be evacuated by vomiting, and the ulcer soon healed.

*Cure.* It appears from dissections, that the stomach may very often be inflamed when the characteristic marks of it have not appeared; and therefore we cannot lay down any general rules for the cure of this disease. When the symptoms appear in the manner above described, the cure is to be attempted by large and repeated bleedings employed early in the disease; and from these we are not to be deterred by the weakness of the pulse, for it has commonly become fuller and softer after the operation. A blister ought also to be applied to the region of the stomach; and the cure will be assisted by fomentations of the whole abdomen, and by frequent emollient and laxative glysters. The irritability of the stomach in this disease will admit of no medicines being thrown into it; and if any can be supposed necessary, they must be exhibited in glysters. Diluting drinks may be tried; but they must be of the very mildest kind, and given in very small quantities at a time. Opiates, in whatever manner exhibited, are very hurtful during the first days of the disease; but when the violence of the disease shall have abated, and when the pain and vomiting recur at intervals only, opiates given in glysters may frequently be employed with advantage. A tendency to gangrene in this disease is to be obviated only by the means just now mentioned; and when it does actually supervene, it admits of no remedy. A tendency to suppuration is to be obviated by the same means employed early in the disease. After a certain period it cannot be prevented by any means whatever; and, when actually begun, must be left to nature; the only thing that can be done by art being to avoid all irritation.

#### XLIX. The Erysipelatous GASTRITIS. B.

*Description.* This species of inflammation takes place in the stomach much more frequently than the former. From dissections it appears that the stomach has been often affected with inflammation, when neither pain nor fever had given any notice of it; and such is justly looked upon to have been of the erysipelatous kind. This kind of inflammation also is especially to be expected from acrimony of any kind applied to the stomach; and would certainly occur much more frequently, were not the interior surface of this organ commonly defended by mucus exuding in large quantity from the numerous follicles placed immediately under the villous coat. On many occasions, however, the exudation of mucus is prevented, or the liquid poured out is of a less viscid kind, so as to be less fitted to defend the subjacent nerves; and it is in such cases that acrid matters may readily produce an erysipelatous affection of the stomach.

In many cases, however, this kind of inflammation cannot be discovered, as it takes place without pain, pyrexia, or vomiting; but in some cases it may; namely, when it spreads into the œsophagus, and appears on the pharynx and on the whole internal surface of the mouth. When therefore an erysipelatous inflammation affects the mouth and fauces, and there shall be at the same time in the stomach an unusual sensibility to all acrids, and also a frequent vomiting, there can be little doubt of the stomach's being affected

in the same manner. Even when no inflammation appears in the fauces, if some degree of pain be felt in the stomach, if there be a want of appetite, an anxiety and frequent vomiting, an unusual sensibility with regard to acrids, some thirst, and frequency of pulse, there will then be room to suspect an inflammation in the stomach; and such symptoms, after some time, have been known to discover their cause by the inflammation arising in the fauces or mouth. Inflammation of this kind is often disposed to pass from one place to another on the same surface, and, in doing so, to leave the place it had at first occupied. Such an inflammation hath been known to spread successively along the whole length of the alimentary canal; occasioning, when in the intestines, diarrhoea, and in the stomach vomitings; the diarrhoea ceasing when the vomitings came on, and the vomitings on the coming on of the diarrhoea.

*Causes, &c.* An erysipelatous inflammation may arise from acrid matters taken into the stomach; or from some internal causes not yet well known. It frequently occurs in putrid diseases, and in those recovering from fevers.

*Cure.* When the disease is occasioned by acrid matters taken internally, and these may be supposed still present in the stomach, they are to be washed out by drinking a large quantity of warm and mild medicines, and exciting vomiting. At the same time, if the nature of the acrimony, and its proper corrector be known, this should be thrown in; or if a specific corrector be not known, some general demulcents should be employed.

These measures, however, are more suited to prevent, than to cure inflammation after it has taken place. When this last may be supposed to have happened, if it be attended with a sense of heat, with pain and pyrexia, according to the degree of these symptoms, the measures proposed for the cure of the other kind are to be more or less employed. When an erysipelatous inflammation of the stomach hath arisen from internal causes, if pain and pyrexia occur, bleeding may be employed in persons not otherwise weakened; but in case of its occurring in putrid diseases, or where the patients are already debilitated, bleeding is inadmissible; all that can be done being to avoid irritation, and only throwing into the stomach what quantity of acids and acescent aliments it shall be found able to bear. In some conditions of the body in which this disease is apt to occur, the Peruvian bark and bitters may seem to be indicated; but an erysipelatous state of the stomach will seldom allow them to be used.

#### GENUS XIV. ENTERITIS, or Inflammation of the INTESTINES.

Enteritis, *Sauv.* gen. 105. *Lin.* 29. *Vog.* 57. *Sag.* gen. 307.  
Intestiniurum inflammatio, *Boerh.* 959.  
Febris intestiniurum inflammatoria ex mesenterio, *Hoffm.* II. 170.

##### L. The Acute ENTERITIS.

Enteritis iliaca, *Sauv.* sp. 1.  
Enteritis colica, *Sauv.* sp. 2. *Boerh.* 963.

*Description.* This disease shews itself by a fixed pain in



in the abdomen, attended with fever, vomiting, and colicness. The pain is often felt in different parts of the abdomen, but more frequently spreads over the whole, and is particularly violent about the navel.

*Causes, &c.* Inflammations of the intestines may arise from the same causes as those of the stomach; though commonly the former will more readily occur from cold applied to the lower extremities, or to the belly itself. It is also found supervening on the spasmodic colic, incarcerated hernia, and volvulus.

*Prognosis.* Inflammations of the intestines have the same terminations with those of the stomach, and the prognosis in both cases is much the same.

*Cure.* The cure of enteritis is in general the same with that of gastritis: but in the former there is commonly more access to the introduction of liquids, of acid, aceseent, and other cooling remedies, and even of laxatives; but as a vomiting frequently attends the enteritis, care must be taken not to excite that vomiting by the quantity or quality of any thing thrown into the stomach. With regard to the suppurration and gangrene of the intestines following the enteritis, the same thing is to be understood as is mentioned under the GASTRITIS.

portarum; but of the last there is no proof, nor is the supposition at all probable. The acute hepatitis seems rather to be an affection of the external membrane of the liver, and the chronic kind to be an affection of the parenchyma of that viscus. The acute disease may be seated either on the convex or concave surface of the liver; and in the former case a more pungent pain and hiccup may be produced, and the respiration is more considerably affected. In the latter there occurs less pain; and a vomiting is produced, commonly by some inflammation communicated to the stomach. The inflammation on the concave surface of the liver, may be readily communicated to the gall-bladder and biliary ducts: and this, perhaps, is the only case of idiopathic hepatitis attended with jaundice.

*Prognosis.* The inflammation of the liver, like others, may end by resolution, suppuration, or gangrene; and the tendency to the one or to the other of those events may be known from what has been already mentioned concerning the prognosis in gastritis. The resolution of hepatitis is often the consequence of, or is attended with, evacuations of different kinds. A hæmorrhage, sometimes from the nose, and sometimes from the hæmorrhoidal vessels, gives a solution of the disease. Sometimes the same thing is accomplished by a bilious diarrhoea; and sometimes the resolution is attended with sweating, and an evacuation of urine depositing a copious sediment. Sometimes it may be cured by an erysipelas appearing in some external part.

When the disease hath ended in suppuration, the pus collected may be discharged by the biliary ducts; or, if the suppurated part does not adhere any where closely to the neighbouring parts, into the cavity of the abdomen; but if, during the first state of inflammation, the affected part of the liver shall have formed a close adhesion to some of the neighbouring parts, the discharge after suppuration may be various, according to the different seat of the abscess. When seated on the convex part of the liver, if the adhesion be to the peritonæum lining the common teguments, the pus may make its way through these, and be discharged outwardly: or if the adhesion shall have been to the diaphragm, the pus may penetrate through this, and into the cavity of the lungs; from whence it may be discharged by coughing. When the abscess is seated on the concave part of the liver, in consequence of adhesions, the pus may be discharged into the stomach or intestines; and into these last, either directly, or by the intervention of the biliary ducts. Upon a consideration of all these different circumstances therefore, together with the general principles of inflammation, must the prognosis of this disease be established.

*Cure.* For the cure of hepatitis, we must have recourse to the general means of removing other inflammatory disorders. Bleeding is to be used according to the degree of fever and pain. Blisters are to be applied: fomentations of the external parts, emollient glysters, gentle laxatives, diluents and refrigerants, are also useful. But when a suppuration has been formed, and the abscess points outwardly, the part must be opened, the pus evacuated, and the ulcer healed according to the ordinary methods in use for healing abscesses and ulcers in other parts.

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### LI. Erysipetalous ENTERITIS.

Concerning this nothing farther can be said, than what hath been already delivered concerning the gastritis.

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### LII. HEPATITIS, or Inflammation of the LIVER. Genus XVII.

Hepatitis, *Sauv.* gen. 113. *Lin.* 35. *Vog.* 58. *Sag.* gen. 312. *Boerh.* 914. *Hoffm.* II. 14. *Junc.* 66.

*Description.* The inflammation of the liver is thought to be of two kinds, acute and chronic: but the latter very often does not discover itself except by an abscess found in the liver after death, and which is supposed to have been occasioned by some degree of inflammation; for this reason the chronic inflammation cannot be described, and we shall here only treat of the acute hepatitis.

The acute hepatitis is attended with considerable fever; a frequent, strong, and hard pulse; high coloured urine; an acute pain in the right hypochondrium, increased by pressing upon the part. The pain is very often in such a part of the side as to make it appear like a pleurisy; and frequently, like that, is increased on inspiration. The disease is also commonly attended with a cough, which is generally dry, but sometimes moist; and when the pain thus resembles a pleurisy, the patient cannot lie easily except upon the side affected. The pain is frequently extended to the clavicle, and to the top of the shoulder; and is attended sometimes with hiccup, and sometimes with vomiting. Some have added jaundice, or a yellowness of the eyes, to the symptoms of this distemper; but experience shews that it hath often occurred without any such symptom.

*Causes, &c.* The remote causes of hepatitis are not always to be discerned, and many have been assigned on a very uncertain foundation. It has been supposed that the disease may be an affection either of the extremities of the hepatic artery, or those of the vena

LII. SPLENITIS, or *Inflammation of the Spleen.*  
Genus XVIII.

- Splenitis, *Sauv.* gen. 114. *Lin.* 36. *Vog.* 59.  
*Junck.* 67. *Sag.* gen. 313.  
Lienis inflammatio, *Boerb.* 958. & III. *Van Swieten*  
Comm.  
Splenitis phlegmonodea, *Sauv.* sp. 1. *Forstl.* l. xx.  
obl. 5. 6. *De Haen*, apud *Van Swieten*, p. 958.  
Pleuritis splenica, *Sauv.* sp. 19.  
Splenalgia suppuratio, *Sauv.* sp. 3.

*Description.* This disease, according to *Juncker*, comes on with a remarkable shivering, succeeded by a most intense heat and very great thirst; a pain and tumour are perceived in the left hypochondrium, and the paroxysms for the most part assume a quartan form. When the patients expose themselves for a little to the free air, their extremities immediately grow very cold. If an hæmorrhage happens, the blood flows out of the left nostril. The other symptoms are the same with those of the hepatitis. Like the liver, it is also subject to a chronic inflammation, which often happens after agues, and is commonly called the *ague cake*.

*Cause*, &c. The causes of this distemper are in general the same with those of other inflammatory disorders; but those which determine the inflammation to that particular part more than another, are very much unknown. It attacks persons of a very plethoric and sanguine habit of body rather than others.

*Prognosis.* What hath been said of the inflammation of the liver applies also to that of the spleen, tho' the latter is less dangerous than the former. Here also a vomiting of black matter, which in other acute diseases is such a fatal omen, sometimes proves critical, according to the testimony of *Juncker*. Sometimes the hæmorrhoids prove critical; but very often the inflammation terminates by scirrhus.

*Cure.* This is not at all different from what hath been already laid down concerning the hepatitis.

GENUS XIX. NEPHRITIS, or *Inflammation of the KIDNEYS.*

- Nephritis, *Sauv.* gen. 115. *Lin.* 37. *Vog.* 65.  
*Sag.* gen. 314.

LIIII. The *Genuine* NEPHRITIS.

- Nephritis vera, *Sauv.* sp. 1.

*Description.* The nephritis has the same symptoms in common with other inflammations; but its distinguishing mark is the pain in the region of the kidney, which is sometimes obtuse, but sometimes pungent. The pain is not increased by the motion of the trunk of the body so much as a pain of the rheumatic kind affecting the same region. It may also frequently be distinguished by its shooting along the course of the ureter, and is frequently attended with a drawing up of the testicle, and a numbness of the limb on the side affected; though indeed these symptoms most commonly attend the inflammation arising from a calculus in the kidney or ureter. The disease is also attended with frequent vomiting, and often with colicæus and colic pains. The urine is most commonly of a deep red colour, and is voided frequently and in a small quantity at a time. In more violent cases the urine is

commonly colourless.

*Cause*, &c. The remote causes of this disease may be various; as external contusion, violent or long-continued riding; strains of the muscles of the back-incident on the kidneys; various acrids in the course of circulation conveyed to the kidney; and perhaps some other internal causes not yet well known: the most frequent is that of calculous matter obstructing the *tubuli uriniferi*, or calculi formed in the pelvis of the kidneys, and either sticking ther or fallen into the ureter.

*Prognosis.* This is not different from that of other inflammatory diseases.

*Cure.* This is to be attempted by bleedings, external fomentation, frequent emollient glysters, antiphlogistic purgatives, and by the free use of mild and demulcent liquids. The use of blisters is scarce admissible, or at least will require great care to avoid any considerable absorption of the cantharides.

The other species of nephritis enumerated by authors are only symptomatic.

GENUS XX. CYSTITIS, or *Inflammation of the BLADDER.*

- Cystitis, *Sauv.* gen. 108. *Lin.* 31. *Vog.* 66.  
*Sag.* gen. 309.  
Inflammatio vesicæ, *Hoffm.* II. 157.

- LIV. The CYSTITIS from *Internal Cause*. 305  
Cystitis spontanea, *Sauv.* sp. 1.

- LV. The CYSTITIS from *External Cause*. 306  
Cystitis a cantharidibus, *Sauv.* sp. 2.  
Cystitis traumatica, *Sauv.* sp. 3.

The inflammation of the bladder from internal causes is a very rare distemper; and when it does at one occur, is to be cured in the same manner with other inflammations, avoiding only the use of cantharides. When the disease arises from the internal use of these flies, camphire is recommended, besides other cooling medicines, and particularly cooling and emollient glysters.

LVI. HYSTERITIS, or *Inflammation of the Uterus.* 307  
Genus XXI.

- Hysteritis, *Lin.* 38. *Vog.* 63.  
Metritis, *Sauv.* gen. 107. *Sag.* gen. 315.  
Inflammatio et febris uterina, *Hoffm.* II. 156.

*Description.* This disease is often confounded with that called the *puerperal or child-bed fever*; but is very essentially distinct from it, as will be shown in its proper place. The inflammation of the uterus is often apt to terminate by gangrene: there is a pain in the head, with delirium; and the uterine region is so exceedingly tender, that it cannot bear the most gentle pressure without intolerable pain. When the *fundus uteri* is inflamed, there is great heat, throbbing, and pain, above the pubes; if its posterior part, the pain is more confined to the loins and rectum, with a tenesmus; if its anterior part, it shoots from thence towards the neck of the bladder, and is attended with a frequent irritation to make water, which is voided with difficulty; and if its sides or the ovaria are affected, the pains will then dart into the inside of the thighs.

*Cause*, &c.

*Causes, &c.* Inflammations of the uterus, and indeed of the rest of the abdominal viscera, are very apt to take place in lying-in women; the reason of which seems to be the sudden change produced in the habit, and an alteration in the course of the circulating blood by the contraction of the uterus after delivery. The pressure of the gravid uterus being suddenly taken off from the *aorta descendens* after delivery, the resistance to the impulse of the blood passing through all the vessels derived from it, and distributed to the contiguous viscera, will be considerably lessened; it will therefore rush into those vessels with a force superior to their resistance; and, by putting them violently on the stretch, may occasion pain, inflammation, and fever. This contraction of the uterus also renders its vessels impervious to the blood which had freely passed through them for the service of the child during pregnancy; and consequently a much larger quantity will be thrown upon the contiguous parts, which will still add to their distension, and increase their tendency to inflammation.

*Prognosis.* An inflammation of the uterus generally may be expected to produce an obstruction of the lochia; but the fever produced seldom proves mortal, unless the inflammation is violent and ends in a gangrene.

*Cure.* This is to be attempted by the same general means already recommended, and the management of this disorder entirely coincides with that of the puerperal fever.

Lumbago scorbutica, *Sauv.* sp. 5.  
Pleurodyne scorbutica, *Sauv.* sp. 11.  
Icthias syphiliticum, *Sauv.* sp. 7.  
Pleurodyne venerea, *Sauv.* sp. 5.  
Lumbago sympathica, *Sauv.* sp. 13.  
*a mesenterii glandulis induratis*  
*a pancreate tumido, purulento, scirrhus, putri*  
*ab induratis pyloro, vena cava, pancreate*  
*a rene scirrhus, putrefacto*  
*ab abscessu circa vena cava bifurcationem*  
*a vermibus intra renes.*

Lumbago a saburra, *Sauv.* sp. 8.  
Pleurodyne a cacochylia, *Sauv.* sp. 7.  
Rheumatismus saltatorius verminosus, *Sauv.* sp. 8.  
Icthias verminosus, *Sauv.* sp. 8.  
Pleurodyne verminosa, *Sauv.* sp. 2.  
Rheumatismus metallicus, *Sauv.* sp. 10.  
Lumbago a hydrothorace, *Sauv.* sp. 14.  
Lumbago pseudoichthuria, *Sauv.* sp. 16.  
Pleurodyne a rupto oesophago, *Sauv.* sp. 20.  
Pleurodyne rachitica, *Sauv.* sp. 13.  
Icthias a spargano, *Sauv.* sp. 5.  
Pleurodyne catarrhalis, *Sauv.* sp. 14.  
Rheumatismus necroscos, *Sauv.* sp. 14.  
Rheumatismus dorsalis, *Sauv.* sp. 11.  
Lumbago a fatyriasis, *Sauv.* sp. 15.  
Rheumatismus febriculosus, *Sauv.* sp. 9.  
Lumbago febrilis, *Sauv.* sp. 4.  
&c. &c.

*Description.* The rheumatism is particularly distinguished by pains affecting the joints, and for the most part the joints alone; but sometimes also the muscular parts. Very often they shoot along the course of the muscles from one joint to another, and are always much increased by the action of the muscles belonging to the joint or joints affected. The larger joints are those most frequently affected, such as the hip-joint and knees of the lower extremities, and the shoulders and elbows of the upper ones. The ankles and wrists are also frequently affected; but the smaller joints, such as those of the toes or fingers, seldom suffer. Sometimes the disease is confined to one part of the body, yet very frequently affects many parts of it; and then it begins with a cold stage, which is immediately succeeded by the other symptoms of pyrexia, and particularly by a frequent, full, and hard pulse. Sometimes the pyrexia is formed before any pains are perceived; but more commonly pains are felt in particular parts before any symptoms of pyrexia occur. When no pyrexia is present, the pain may be confined to one joint only; but when any considerable pyrexia takes place, though the pain may chiefly be felt in one joint, yet it seldom happens but that the pains affect several joints, often at the very same time, but for the most part shifting their place, and having abated in one joint become more violent in another. They do not commonly remain long in the same joint, but frequently shift from one to another, and sometimes return to joints formerly affected; and in this manner the disease often continues for a long time. The pyrexia hath an exacerbation every evening, and is most considerable during the night, when the pains also become more violent; and it is at the same time that the pains shift their place from one joint to another. These seem to be also increased during the night by the body

308 GENUS XXII. RHEUMATISMUS; the RHEUMATISM.

Rheumatismus, *Sauv.* gen. 185. *Lin.* 62. *Vog.* 138. *Boerb.* 1400. *Junck.* 19.  
Dolores rheumatici et arthritici, *Hoffm.* II. 317.  
Myositis, *Sag.* gen. 301.

309 LVII. The *Acute* RHEUMATISM. Sp. I.

Rheumatismus acutus, *Sauv.* sp. 1.  
Rheumatismus vulgaris, *Sauv.* sp. 2.

310 LVIII. The LUMBAGO, or Rheumatism in the Loins. Var. A.

Lumbago rheumatica, *Sauv.* gen. 212. *Sag.* p. 1.  
Nephralgia rheumatica, *Sauv.* sp. 4.

311 LIX. The SCIATICA, Icthias, or Hip-Gout. Var. B.  
Icthias rheumaticum, *Sauv.* 213. sp. 10.

312 LX. The *Bastard* PLEURISY. Var. C.

Pleurodyne rheumatica, *Sauv.* gen. 148. sp. 3.  
Pleuritis spuria, *Boerb.* 878.

The other species, which are very numerous, are all symptomatic; as,

Lumbago plethorica, *Sauv.* sp. 3.  
Icthias sanguineum, *Sauv.* sp. 2.  
Pleurodyne plethorica, *Sauv.* sp. 1.  
Rheumatismus hystericus, *Sauv.* sp. 7.  
Icthias hystericum, *Sauv.* sp. 3.  
Pleurodyne hysterica, *Sauv.* sp. 6.  
Rheumatismus saltatorius, *Sauv.* sp. 8.  
Pleurodyne flatulenta, *Sauv.* sp. 4.  
Pleurodyne a spasmate, *Sauv.* sp. 9.  
Rheumatismus scorbuticus, *Sauv.* sp. 4.



ACTIVE dy being covered more closely, and kept warmer.

A joint, after having been for some time affected with pain, commonly becomes also affected with some swelling and redness, which is painful to the touch. It seldom happens that a swelling coming on does not take off the pain entirely, or secure the joint against a return of it. This disease is commonly attended with more or less sweating, which occurs early, but is seldom free or copious, and seldom either relieves from the pains or proves critical. The urine is high-coloured, and in the beginning without sediment. This, however, does not prove entirely critical, for the disease often continues long after such a sediment has appeared in the urine. The blood is always fizy. The acute rheumatism differs from all other inflammatory diseases in not being liable to terminate in suppuration: this almost never happens; but the disease sometimes produces effusions of a transparent gelatinous fluid into the sheaths of the tendons: but if these effusions are frequent, it is certain that the liquor must very frequently be absorbed; for it very seldom happens, that considerable or permanent tumours have been produced, or such as required to be opened and to have the contained fluid evacuated. Such tumours, however, have sometimes occurred, and the opening made in them has produced ulcers very difficult to heal.

Sometimes the rheumatism will continue for several weeks; however, it seldom proves fatal, and it is rare that the pyrexia continues to be considerable for more than two or three weeks. While the pyrexia abates in its violence, if the pains of the joints continue, they are less violent; more limited in their place, being confined commonly to one or a few joints only; and are less likely to change their place.

*Causes, &c.* This disease is frequent in cold, and more uncommon in warm, climates. It appears most frequently in autumn and spring; less frequently in winter, while the frost is constant; and very seldom during the heat of summer. It may, however, occur at any season, if vicissitudes of heat and cold be for the time frequent. For the most part, the acute rheumatism arises from the application of cold to the body when unusually warm; or when the cold is applied to one part of the body, whilst the other parts are kept warm; or lastly, when the application of the cold is long continued, as when moist or wet clothes are applied to any part of the body.—These causes may affect persons of all ages; but the rheumatism seldom appears either in very young or in elderly persons, and most commonly occurs from the age of puberty to that of 35. These causes may also affect persons of any constitution, but they most commonly affect those of a sanguine temperament.

With respect to the proximate cause of rheumatism, there have been various opinions. It has been imputed to a peculiar acrimony: of which, however, there is no evidence; and the consideration of the remote causes, the symptoms, and cure, render it very improbable. A disease of a rheumatic nature, however, may be occasioned by an acrid matter applied to the nerves, as is evident from the tooth-ach, a rheumatic affection generally arising from a carious tooth. Pains arising from deep-seated suppurations may also resemble the rheumatism; and many cases have oc-

curring in which such suppurations occasioned pains resembling the lumbago and ischia; but from what hath been already said, it seems improbable that ever any rheumatic case should end in suppuration.

The proximate cause of rheumatism hath by many been supposed to be a lentor in the fluids obstructing the vessels of the part; but in the former part of this treatise, sufficient reasons have been already laid down for rejecting the doctrine of lentor. While we cannot therefore find either evidence or reason for supposing that the rheumatism depends on any change in the state of the fluids, we must conclude that the proximate cause of it is the same with that of other inflammations not depending upon a direct stimulus.

In the case of rheumatism, it is supposed that the most common remote cause of it, that is, cold applied, operates especially on the vessels of the joints, these being less covered by a cellular texture than those of the intermediate parts of the limbs. It is farther supposed, that the application of cold produces a contraction of the extreme vessels, and at the same time an increase of tone or phlogistic diathesis in the course of them, from which arises an increased impetus of the blood, and at the same time a resistance to the free passage of it, and consequently inflammation and pain. It is also supposed, that the resistance formed excites the *vis medicatrix* to a further increase of the impetus of the blood; and to support this, a cold stage arises, a spasm is formed, and a pyrexia and phlogistic diathesis are produced in the whole system.

Hence the cause of rheumatism appears to be exactly analogous to that of inflammations depending on an increased afflux of blood to a part while it is exposed to the action of cold. But there seems to be further in this disease some peculiar affection of the muscular fibres. These seem to be under some degree of rigidity; and therefore less easily admit of motion, and are pained upon the exertions of it. This also seems to be the affection which gives opportunity to the propagation of pains from one joint to another, and which are most severely felt in the extremities terminating in the joints, because beyond these the oscillations are not propagated. This affection of the muscular fibres explains the manner in which strains and spasms produce rheumatic affections; and, on the whole, shews, that with an inflammatory affection of the sanguiferous system, there is also in rheumatism a peculiar affection of the muscular fibres, which has a considerable share in producing the phenomena of the disease.

*Cure.* Here we must remember, that in the acute rheumatism there is an inflammatory affection of the parts, and a phlogistic diathesis of the whole system. The cure therefore requires, in the first place, an antiphlogistic regimen, and particularly a total abstinence from animal-food, and from all fermented or spirituous liquors; substituting a mild vegetable or milk diet, and the plentiful use of soft diluting liquors. On this principle, blood-letting is the chief remedy of acute rheumatism. The blood is to be drawn in large quantity; and the bleeding is to be repeated in proportion to the frequency, fulness, and hardness of the pulse, and the violence of the pain. For the most part, large and repeated bleedings during the first

days of the disease seem to be necessary, and accordingly have been very much employed: but to this some bounds are to be set; for very profuse bleedings occasion a slow recovery, and, if not absolutely effectual, are ready to produce a chronic rheumatism.

To avoid that debility of the system which general bleedings are apt to occasion, the urgent symptom of pain may be often relieved by topical bleedings; and when any swelling or redness have come upon a joint, the pain may very certainly be relieved by topical bleedings: but as the pain and continuance of the disease seem to depend more upon the phlogistic diathesis of the whole system than upon the affection of particular parts, so topical bleedings will not supply the place of the general bleedings proposed above.

To take off the phlogistic diathesis prevailing in this disease, purging may be useful, if procured by medicines which do not stimulate the whole system, as neutral salts, and other medicines which have a refrigerant power. Purging, however, is not so useful as bleeding in removing phlogistic diathesis; and when the disease has become general and violent, frequent stools are inconvenient, and even hurtful, by the motion and pain which they occasion.

In this disease, external applications are of little service. Fomentations in the beginning of the disease rather aggravate than relieve the pains. The rubefacients and camphire are more effectual; but they generally only shift them from one part to another, and do not prove any cure of the general affection. Blistering may also be very effectual in removing the pain from a particular part; but will be of little use, except where the pains are much confined to a particular place.

The several remedies above-mentioned moderate the violence of the disease, and sometimes remove it entirely; but they sometimes fail, and leave the cure imperfect. The attempting a cure by large and repeated bleedings is attended with many inconveniences; and the most effectual and safe method of cure is, after some general bleedings for taking off, or at least diminishing, the phlogistic diathesis, to employ sweating conducted by the rules laid down when speaking of the cure of synocha. Opiates, except where they are directed to procure sweat, always prove hurtful in every stage of this disease. The Peruvian bark has been supposed a remedy in some cases; but it is seldom found useful, and is frequently hurtful. It seems only fit for those cases in which the phlogistic diathesis is much abated, and at the same time the exacerbations of the disease are manifestly periodical, with considerable remissions interposed. Calomel, and other preparations of mercury, have been recommended in some cases of the acute rheumatism; but Dr Cullen is of opinion that they are only useful in cases approaching to the nature of the chronic kind.

### 313 LXI. ARTHRODYNIA, or *Chronic RHEUMATISM.* *Rheumatismus chronicus Auctorum.*

*Description.* When the pyrexia attending the acute rheumatism hath ceased; when the swelling and redness of the joints are entirely gone, but pains still continue to affect certain joints, which remain

stiff, feel uneasy upon motion, changes of weather, or in the night-time only; the disease is then called the *chronic rheumatism*, as it often continues for a very long time.

The limits between the acute and chronic rheumatisms are not always exactly marked. When the pains are still ready to shift their place; when they are especially severe in the night-time; when, at the same time, they are attended with some degree of pyrexia, and with some swelling, and especially some redness, of the joints; the disease is to be considered as partaking of the nature of the acute rheumatism. But when there is no longer any degree of pyrexia remaining; when the pained joints are without redness; when they are cold and stiff; when they cannot easily be made to sweat; or when, while a free and warm sweat is brought out on the rest of the body, it is only clammy and cold on the pained joints; and when further, the pains of these are increased by cold, and relieved by heat, applied to them; the case is to be considered as that of a purely chronic rheumatism.

The chronic rheumatism may affect different joints; but is especially apt to affect those which are surrounded with many muscles, and those of which the muscles are employed in the most constant and vigorous exertions. Such is the case of the vertebrae of the loins, the affection of which is named *lumbago*; or of the hip joint, when the disease is named *ischias*, or *sciatica*.

Violent strains and spasms occurring on sudden and somewhat violent exertions, bring on rheumatic affections, which at first partake of the acute, but very soon change into the nature of the chronic rheumatism.—Such are frequently the lumbago, and other affections, which seem to be more seated in the muscles than in the joints. The distinction of the rheumatic pains from those resembling them which occur in the liphylis and scurvy must be obvious, either from the seat of the pains, or from the concomitant symptoms peculiar to those diseases. The distinction of the rheumatism from the gout will be more fully understood from what is laid down in the following genus.

*Causes, &c.* The phenomena of the purely chronic rheumatism lead us to conclude, that its proximate cause is an atony both of the blood-vessels and of the muscular fibres of the part affected, together with such a degree of rigidity and contraction in the latter as frequently attend them in a state of atony.

*Cure.* From the view just now given of the proximate cause of chronic rheumatism, the indication of cure must be, to restore the activity and vigour of the vital principle in the part.—The remedies are either external or internal.

The external are, the supporting the heat of the part, by keeping it constantly covered with flannel; the increasing the heat of the part by external heat, applied either in a dry or humid form; the diligent use of the flannel brush, or other means of friction; the application of electricity in sparks or shocks; the application of cold water by affusion or immersion; the application of essential oils of the most warm and penetrating kind; the application of salt brine; and lastly, the employment either of exercise, of the part itself as far as it can easily bear, or by riding or other mode of gestation.

The

The internal remedies are, 1. Large doses of essential oils drawn from resinous substances, such as turpentine. 2. Substances containing such oils, as guaiac. 3. Volatile alkaline salts. 4. These or other medicines directed to procure sweat; and, 5. Calomel, or some other preparation of mercury, in small doses, continued for some time. Besides these, there are several others recommended; as bleeding, general and topical; burning, blistering, and issues: but these, to Dr Cullen, seem only useful when the disease still partakes of the nature of the acute rheumatism.

## 314 LXII. ODONTALGIA, the TOOTH-ACH. G. XXIV.

Odontalgia, *Sauv. gen.* 198. *Lin.* 45. *Vog.* 145.

*Sag. gen.* 157. *Junck.* 25.

Odontalgia five rheumatismus odontalgicus, *Hoffm.* II. 339.

Odontalgia cariola, *Sauv. sp.* 1.

Odontalgia scorbutica, *Sauv. sp.* 4.

Odontalgia catarrhalis, *Sauv. sp.* 3.

Odontalgia arthritica, *Sauv. sp.* 6.

Odontalgia gravidarum, *Sauv. sp.* 2.

Odontalgia hysterica, *Sauv. sp.* 3.

Odontalgia stomachica, *Sauv. sp.* 9.

*Description.* This well-known disease makes its attack by a most violent pain in the teeth, most frequently in the *molars*, but more rarely in the *incisories*, reaching sometimes up to the eyes, and sometimes backward into the cavity of the ear. At the same time there is a manifest determination to the head, and a remarkable tension and inflation of the vessels takes place, not only in the parts next to that where the pain is seated, but over the whole head.

*Cause, &c.* The toothach is sometimes merely a rheumatic affection arising from cold, but more frequently from a carious tooth. It is also a symptom of pregnancy, and takes place in some nervous disorders; it may attack persons at any time of life, tho' it is most frequent in the young and plethoric.

*Cure.* Many empirical remedies have been proposed for the cure of the tooth-ach, but none have in any degree answered the purpose. When the affection is purely rheumatic, blistering behind the ear will almost always remove it; but when it proceeds from a carious tooth, the pain is much more obdurate. In this case it hath been recommended to touch the pained part with a hot iron, or with oil of vitriol, in order to destroy the aching nerve; to hold strong spirits in the mouth; to put a drop of oil of cloves into the hollow of the tooth, or a pill of equal parts of opium and camphire. The Peruvian bark hath also been recommended, and perhaps with more justice, on account of its tonic and antiseptic powers; but very often all these remedies will fail, and the only infallible cure is to draw the tooth. See SURGERY.

## 315 GENUS XXIV. PODAGRA, the GOUT.

Podagra, *Vog.* 175. *Boerb.* 1254.

Febris podagrica, *Vog.* 69.

Arthritis, *Sauv. gen.* 183. *Lin.* 60. *Vog.* 139. *Sag. gen.* 142.

Dolor podagricus et arthriticus verus, *Hoffm.* II. 339.

Dolores arthritici, *Hoffm.* II. 317.

Affectus spastico-arthritici, *Junck.* 46.

## LXIII. The Regular Gout. Sp. II.

Arthritis podagra, *Sauv. sp.* 1.

Arthritis rachialgica, *Sauv. sp.* 11.

Arthritis æstiva, *Sauv. sp.* 4.

## LXIV. The Atonic Gout. Sp. II.

Arthritis melancholica, *Sauv. sp.* 6.

Arthritis hiemalis, *Sauv. sp.* 2.

Arthritis chlorotica, *Sauv. sp.* 5.

Arthritis asthmatica, *Sauv. sp.* 9.

## LXV. The Retrocedent Gout.

## LXVI. The Mislplaced Gout.

*Description.* What we call a *paroxysm of the gout* is principally constituted by an inflammatory affection of some of the joints. This sometimes comes on suddenly, without any warning, but is generally preceded by several symptoms; such as the ceasing of a sweating which the feet had been commonly affected with before; an unusual coldness of the feet and legs; a frequent numbness, alternating with a sense of prickling along the whole of the lower extremities; frequent cramps of the muscles of the legs; and an unusual turgescence of the veins.

While these symptoms take place in the lower extremities, the body is affected with some degree of torpor and languor, and the functions of the stomach in particular are more or less disturbed. The appetite is diminished; and flatulency, or other symptoms of indigestion, are felt. These symptoms take place for several days, sometimes for a week or two, before a paroxysm comes on; but commonly, upon the day immediately preceding it, the appetite becomes greater than usual.

The circumstances of paroxysms are the following. They come on most commonly in the spring; and sooner or later, according as the vernal heat succeeds sooner or later to the winter's cold; and, perhaps, sooner or later also, according as the body may happen to be more or less exposed to vicissitudes of heat and cold.

The attacks are sometimes felt first in the evening, but more commonly about two or three o'clock of the morning. The paroxysm begins with a pain affecting one foot, most commonly in the ball or first joint of the great toe, but sometimes in other parts of the foot. With the coming on of this pain, there is commonly more or less of a cold shivering; which, as the pain increases, gradually ceases; and is succeeded by a hot stage of pyrexia, which continues for the same time with the pain itself. From the first attack, the pain becomes, by degrees, more violent, and continues in this state with great restlessness of the whole body till next midnight, after which it gradually remits; and, after it has continued for 24 hours from the commencement of the first attack, it commonly ceases very entirely; and, with the coming on of a gentle sweat, allows the patient to fall asleep. The patient, upon coming out of this sleep in the morning, finds the pained part affected with some redness and swelling, which, after having continued for some days, gradually abate.

When a paroxysm has thus come on, although the violent pain after 24 hours be considerably abated, the patient is not entirely relieved from it. For some days



**PRACTICE** joints or other parts, produces the several phenomena of the disease.

This doctrine, however ancient and general, appears to Dr Cullen very doubtful. For,

First, there is no direct evidence of any morbid matter being present in persons disposed to the gout. There are no experiments or observations which shew that the blood or other humours of gouty persons are in any respect different from those of others. Previous to attacks of the gout, there appear no marks of any morbid state of the fluids; for the disease generally attacks those persons who have enjoyed the most perfect health, and appear to be in that state when the disease comes on. At a certain period of the disease, a peculiar matter indeed appears in gouty persons; but this, which does not appear in every instance, and which appears only after the disease has subsided for a long time, seems manifestly to be the effect, not the cause, of the disease. Further, tho' there be certain acrids which, taken into the body, seem to excite the gout, it is probable that these acrids operate otherwise in exciting the disease, than by affording the material cause of it. In general, therefore, there is no proof of any morbid matter being the cause of the gout.

Secondly, the suppositions concerning the particular nature of the matter producing the gout, have been so various, and so contradictory to each other, as to allow us to conclude, that there is truly no proof of the existence of any of them. With respect to many of these suppositions, they are so inconsistent with chemical philosophy, and with the laws of the animal economy, that they must be entirely rejected.

Thirdly, the supposition of a morbid matter as the cause, is not consistent with the phenomena of the disease, particularly with its frequent and sudden translations from one part to another.

Fourthly, The supposition is further rendered improbable by this, that, if a morbid matter did exist, its operation should be similar in the several parts which it attacks: whereas it seems to be very different, being stimulant, and exciting inflammation, in the joints; but sedative, and destroying the tone, in the stomach: which, upon the supposition of particular matter acting in both cases, is not to be explained by any difference in the part affected.

Fifthly, Some facts alleged in proof of a morbid matter, are not sufficiently confirmed; such as those which would prove the disease to be contagious. There is, however, no proper evidence of this, the facts given being not only few, but exceptable, and the negative observations innumerable.

Sixthly, Some arguments brought in favour of a morbid matter are founded upon a mistaken explanation. The disease has been supposed to depend upon a morbid matter, because it is hereditary. But the inference is not just: for most hereditary diseases do not depend upon any morbid matter, but upon a particular conformation of the structure of the body transmitted from the parent to the offspring; and this last appears to be particularly the case in the gout. It may be also observed, that hereditary diseases depending upon a morbid matter, appear always much more early in life than the gout commonly does.

Seventhly, The supposition of a morbid matter being the cause of the gout, has been hitherto useless, as

it has not suggested any successful method of cure. **PRACTICE**

Particular suppositions have often corrupted the practice, and have frequently led from those views which might have been useful, and from that practice which experience had approved. Further, though the supposition of a morbid matter has been generally received, it has been as generally neglected in practice. When the gout has affected the stomach, nobody thinks of correcting the matter supposed to be present there, but merely of restoring the tone of the moving fibres.

Eighthly, The supposition of a morbid matter is quite superfluous: for it explains nothing, without supposing that matter to produce a change in the state of the moving powers; and a change in the state of the moving powers, produced by other causes, explains every circumstance without the supposition of a morbid matter; and, to this purpose, it may be observed, that many of the causes exciting the gout, do not operate upon the state of the fluids, but directly and solely upon that of the moving powers.

Lastly, The supposition of a morbid matter is superfluous; because, without that, the disease can be explained in a manner more consistent with its phenomena, with the laws of the animal economy, and with the method of cure which experience has approved. We now proceed to give this explanation; but, before entering upon it, we must premise some general observations.

The first observation is, That the gout is a disease of the whole system, or depends upon a certain general conformation and state of the body, which manifestly appears from the facts above mentioned. But the general state of the system depends chiefly upon the state of its primary moving powers; and therefore the gout may be supposed to be an affection of these chiefly.

The second observation is, That the gout is manifestly an affection of the nervous system; in which the primary moving powers of the whole system are lodged. The occasional or exciting causes are almost all such as act directly upon the nerves and nervous system; and the greater part of the symptoms of the atonic or retrocedent gout are manifestly affections of the same system. This leads us to seek for an explanation of the whole of the disease in the laws of the nervous system, and particularly in the changes which may happen in the balance of its several parts.

The third observation is, That the stomach, which has so universal a consent with the rest of the system, is the internal part that is the most frequently, and often very considerably, affected by the gout. The paroxysms of the disease are commonly preceded by an affection of the stomach; many of the exciting causes act first upon the stomach, and the symptoms of the atonic and retrocedent gout are most commonly and chiefly affections of the same organ. This observation leads us to remark, that there is a balance subsisting between the state of the internal and that of the external parts; and, in particular, that the state of the stomach is connected with that of the external parts; so that the state of tone in the one may be communicated to the other.

These observations being premised, we shall now offer the following pathology of the gout.

In some persons there is a certain vigorous and plethoric

active thoracic state of the system, which at a certain period of life is liable to a loss of tone in the extremities. This is in some measure communicated to the whole system, but appears more especially in the functions of the stomach. When this loss of tone occurs while the energy of the brain still retains its vigour, the *vis medicatrix nature* is excited to restore the tone of the parts; and accomplishes it, by exciting an inflammatory affection in some part of the extremities. When this has subsided for some days, the tone of the extremities and of the whole system is restored, and the patient returns to his ordinary state of health.

This is the course of things in the ordinary form of the disease, which we name the *regular gout*; but there are circumstances of the body, in which this course is interrupted or varied. Thus, when the atony has taken place, if the reaction does not succeed, the atony continues in the stomach, or perhaps in other internal parts; and produces that state which we have, for reasons now obvious, named the *atonic gout*.

A second case of variation in the course of the gout is, when to the atony the reaction and inflammation have to a certain degree succeeded, but from causes either internal or external the tone of the extremities and perhaps of the whole system is weakened; so that the inflammatory state, before it had either proceeded to the degree, or continued for the time, requisite for restoring the tone of the system, suddenly and entirely ceases: whence the stomach, and other internal parts, relapse into the state of atony; and perhaps have that increased by the atony communicated from the extremities: all which appears in what we have termed the *retrocedent state of the gout*.

A third case of variation from the ordinary course of the gout, is, when to the atony, usually preceding, an inflammatory reaction fully succeeds, but has its usual determination to the joints by some circumstances prevented; and is therefore directed to some internal part, where it produces an inflammatory affection, and that state of things which we have named the *misplaced gout*.

*Cure.* In entering upon this, we must observe, in the first place, that a cure has been commonly thought impossible; and we acknowledge it to be very probable, that the gout, as a disease of the whole habit, and very often depending upon original conformation, cannot be cured by medicines, the effects of which are always very transitory, and seldom extend to the producing any considerable change of the whole habit.

It would perhaps have been happy for gouty persons if this opinion had been implicitly received by them; as it would have prevented their having been so often the dupes of self interested pretenders, who have either amused them with inert medicines, or have rashly employed those of the most pernicious tendency. Our author is much disposed to believe the impossibility of a cure of the gout by medicines; and more certainly still inclined to think, that, whatever may be the possible power of medicines, yet no medicine for curing the gout has hitherto been found. Although almost every age has presented a new remedy, all hitherto offered have, very soon after, been either neglected as useless, or condemned as pernicious.

But, though unwilling to admit the power of medicines, yet he contends, that a great deal can be done

towards the cure of the gout by a regimen: and from what has been already observed, he is firmly persuaded, that any man who, early in life, will enter upon the constant practice of bodily labour, and of abstinence from animal-food, will be preserved entirely from the disease.

Whether there be any other means of radically curing the gout, the Doctor is not ready to determine. There are histories of cases of the gout, in which it is said, that by great emotions of mind, by wounds, and by other accidents, the symptoms have been suddenly relieved, and never again returned; but how far these accidental cures might be imitated by art, or would succeed in other cases, is at least extremely uncertain.

The practices proper and necessary in the treatment of the gout, are to be considered under two heads: *First*, As they are to be employed in the intervals of paroxysms; or, *secondly*, As during the time of these. In the intervals of paroxysms, the indications are, to prevent altogether the return of paroxysms; or at least to render them less frequent, and more moderate. During the time of paroxysms, the indications are, to moderate the violence and shorten the duration of them as much as can be done with safety.

1. It has been already observed, that the gout may be entirely prevented by constant bodily exercise, and by a low diet; and Dr Cullen is of opinion, that this prevention may take place even in persons who have a hereditary disposition to the disease. Even when the disposition has discovered itself by several paroxysms of inflammatory gout, he is persuaded that labour and abstinence will absolutely prevent any returns of it for the rest of life. These, therefore, are the means of answering the first indication to be pursued in the intervals of paroxysms.

Exercise in persons disposed to the gout, is directed to two purposes. One of these is the strengthening of the tone of the extreme vessels; and the other, the guarding against a plethoric state. For the former, if exercise be employed early in life, and before intemperance has weakened the body, a very moderate degree of it will answer the purpose; and, for the latter, if abstinence be at the same time observed, little exercise will be necessary.

With respect to exercise, this in general is to be observed, that it should never be violent; for, if violent, it cannot be long continued, and must always endanger the bringing on an atony in proportion to the violence of the preceding exercise.

It is also to be observed, that the exercise of gestation, though considerable and constant, will not, if it be entirely without bodily exercise, answer the purpose in preventing the gout. For this end, therefore, the exercise must be in some measure that of the body; and must be moderate, but at the same time constant and continued through life.

In every case and circumstance of the gout in which the patient retains the use of his limbs, bodily exercise, in the intervals of paroxysms, will be always useful; and, in the beginnings of the disease, when the disposition to it is not yet strong, exercise may prevent a paroxysm which otherwise might have come on. In more advanced states of the disease, however, when there is some disposition to a paroxysm, much walking will bring it on; either as it weakens the tone of the

lower extremities, or as it excites an inflammatory disposition in them; and thus it seems to be, that strains or contusions often bring on a paroxysm of the gout.

Abstinence, the other part of our regimen for preventing the gout, is of more difficult application. If an abstinence from animal food be entered upon early in life, while the vigour of the system is yet entire, our author has no doubt of its being both safe and effectual; but, if the motive for this diet shall not have occurred till the constitution hath been broken by intemperance, or by the decline of life, a low diet may then endanger the bringing on an atonic state.

Further, if a low diet be entered upon only in the decline of life, and be at the same time a very great change in the former manner of living, the withdrawing of an accustomed stimulus of the system may readily throw this into an atonic state.

The safety of an abstemious course may be greater or less according to the management of it. It is animal food which especially disposes to the plethoric and inflammatory state, and that food is to be therefore especially avoided; but, on the other hand, it is vegetable aliment of the lowest quality that is in danger of weakening the system too much by not affording sufficient nourishment, and more particularly of weakening the tone of the stomach by its acescency. It is therefore a diet of a middle nature that is to be chosen; and milk is precisely of this kind, as containing both animal and vegetable matter.

As approaching to the nature of milk, and as being a vegetable matter containing the greatest portion of nourishment, the farinaceous seeds are next to be chosen, and are the food most proper to be joined with milk.

With respect to drink, fermented liquors are useful only when they are joined with animal food, and that by their acescency; and their stimulus is only necessary from custom. When, therefore, animal food is to be avoided, fermented liquors are unnecessary; and by increasing the acescency of vegetables, these liquors may be hurtful. The stimulus of fermented, or spirituous liquors, is not necessary to the young and vigorous, and, when much employed, impairs the tone of the system. These liquors, therefore, are to be avoided, except so far as custom and the declining state of the system may have rendered them necessary. For preventing or moderating the regular gout, water is the only proper drink.

With respect to an abstemious course, it has been supposed, that an abstinence from animal-food and fermented liquors, or the living upon milk and farinacea alone for the space of one year, might be sufficient for a radical cure of the gout: and it is possible that, at a certain period of life, in certain circumstances of the constitution, such a measure might answer the purpose. But this is very doubtful; and it is more probable, that the abstinence must, in a great measure, be continued, and the milk-diet be persisted in, for the rest of life. It is well known, that several persons who had entered on an abstemious course, and had been thereby delivered from the gout, have however, upon returning to their former manner of full living, had the disease return upon them with as much violence as before, or in a more irregular and more dangerous form.

It has been alleged, that, for preventing the return of the gout, blood-letting, or scarifications of the feet, frequently repeated, and at stated times, may be practised with advantage; but of this the Doctor has had no experience.

Exercise and abstinence are the means of avoiding the plethoric state which gives the disposition to the gout; and are therefore the means proposed for preventing the paroxysms, or at least for rendering them less frequent and more moderate. But many circumstances prevent the steadiness necessary in pursuing these measures: and therefore, in such cases, unless great care be taken to avoid the exciting causes, the disease may frequently return; and, in many cases, the preventing of paroxysms is chiefly to be obtained by avoiding those exciting causes already enumerated.

A due attention in avoiding those several causes, will certainly prevent fits of the gout; and the taking care that those exciting causes be never applied in a great degree, will certainly render fits more moderate when they do come on. But, upon the whole, it will appear, that a strict attention to the whole conduct of life, is in this matter necessary; and therefore, when the predisposition has taken place, it will be extremely difficult to avoid the disease.

Dr Cullen is firmly persuaded, that, by obviating the predisposition, and by avoiding the exciting causes, the gout may be entirely prevented: but, as the measures necessary for this purpose will, in most cases, be pursued with difficulty, and even with reluctance, men have been very desirous to find a medicine which might answer the purpose, without any restraint on their manner of living. To gratify this desire, physicians have proposed, and, to take advantage of it, empirics have feigned, many remedies, as we have already observed. Of what nature several of these remedies have been, it is difficult to say: but of those which are unknown, we conclude, from their having been only of temporary fame, and from their having soon fallen into neglect, that they have been either inert or pernicious, and therefore shall make no inquiry after them; and shall now remark only upon one or two known remedies for the gout which have been lately in vogue.

One of these is what has been named in England the *Portland powder*. This is not a new medicine, but is mentioned by Galen, and, with some little variation in its composition, has been mentioned by the writers of almost every age since that time. It appears to have been at times in fashion, and to have again fallen into neglect; and our author thinks that this last has been owing to its having been found to be, in many instances, pernicious. In every instance which the Doctor has known of its exhibition for the length of time prescribed, the persons who had taken it were indeed afterwards free from any inflammatory affection of the joints; but they were affected with many symptoms of the atonic gout; and all, soon after finishing their course of the medicine, have been attacked with apoplexy, asthma, or dropsy, which proved fatal.

Another remedy which has had the appearance of preventing the gout, is an alkali in various forms; such as the fixed alkali, both mild and caustic, lime-water, soap, and absorbent earths. Since it became common to



**PRACTICE** to exhibit these medicines in nephritic and calculous cases, it has often happened that they were given to those who were at the same time subject to the gout; and it has been observed, that under the use of these medicines, gouty persons have been longer free from the fits of their disease. That, however, the use of these medicines has entirely prevented the return of gout, Dr Cullen does not know; because he never pushed the use of those medicines for a long time, being apprehensive that the long-continued use of them might produce a hurtful change in the state of the fluids.

As the preventing the gout depends very much on supporting the tone of the stomach, and avoiding indigestion; so costiveness, by occasioning this, is very hurtful to gouty persons. It is therefore necessary for such persons to prevent or remove costiveness, and by a laxative medicine, when needful; but it is at the same time proper, that the medicine employed should be such as may keep the belly regular, without much purging. Aloetics, rhubarb, magnesia alba, or flowers of sulphur, may be employed, as the one or the other may happen to be best suited to particular persons.

2. These are the several measures to be pursued in the intervals of the paroxysms; and we are next to mention the measures proper during the time of them.

As during the time of paroxysms the body is in a feverish state, no irritation should then be added to it; and every part, therefore, of the antiplogistic regimen, except the application of cold, ought to be strictly observed.

Another exception to the general rule may occur when the tone of the stomach is weak, and when the patient has been before much accustomed to the use of strong drink; for then it may be allowable, and even necessary, to give some animal-food, and a little wine.

That no irritation is to be added to the system during the paroxysms of gout, except in the cases mentioned, is entirely agreed upon among physicians; but it is a more difficult matter to determine, whether, during the time of paroxysms, any measures may be pursued to moderate the violence of reaction and of inflammation. Dr Sydenham has given it as his opinion, that the more violent the inflammation and pain, the paroxysms will be the shorter, as well as the interval between the present and the next paroxysm longer; and, if this opinion be admitted as just, it will forbid the use of any remedies which might moderate the inflammation; which is, to a certain degree, undoubtedly necessary for the health of the body. On the other hand, acute pain presses for relief; and, although a certain degree of inflammation may seem absolutely necessary, it is not certain but that a moderate degree of it may answer the purpose: and it is even probable, that, in many cases, the violence of inflammation may weaken the tone of the parts, and thereby invite a return of paroxysms. It seems to be in this way, that, as the disease advances, the paroxysms become more frequent.

From these last considerations, it seems probable, that, during the time of paroxysms, some measures may be taken to moderate the violence of the inflammation and pain, and particularly, that in first paroxysms, and in the young and vigorous, blood-

letting at the arm may be practised with advantage; but this practice cannot be repeated often with safety; because blood-letting not only weakens the tone of the system, but may also contribute to produce plethora. However, bleeding by leeches on the foot, and upon the inflamed part, may be practised and repeated with greater safety; and instances have been known of its having been practised with safety to moderate and shorten paroxysms; but how far it may be carried, we have not had experience enough to determine.

Besides blood-letting and the antiplogistic regimen, it has been proposed to employ remedies for moderating the inflammatory spasm of the part affected, such as warm bathing and emollient poultices. These have sometimes been employed with advantage and safety; but, at other times, have been found to give occasion to a retrocession of the gout.

Blistering is a very effectual means of relieving and discussing a paroxysm of the gout; but has also frequently had the effect of rendering it retrocedent. The stinging with nettles is analogous to blistering; and probably would be attended with the same danger. The burning with moxa, or other substances, is a remedy of the same kind; but, though not found hurtful, there are no sufficient evidences of its proving a radical cure.

Camphire, and some aromatic oils, have the power of allaying the pain, and of removing the inflammation from the part affected: but these remedies commonly make the inflammation only shift from one part to another, and therefore with the hazard of its falling upon a part where it may be more dangerous; and they have sometimes rendered the gout retrocedent.

From these reflections it will appear, that some danger must attend every external application to the parts affected during a paroxysm; and that therefore the common practice of committing the person to patience and flannel alone, is established upon the best foundation. Opiates give the most certain relief from pain; but, when given in the beginning of gouty paroxysms, occasion these to return with greater violence. When, however, the paroxysms shall have abated in their violence, but still continue to return, so as to occasion painful and restless nights, opiates may be then given with safety and advantage; especially in the case of persons advanced in life, and who have been often affected with the disease. When, after paroxysms have ceased, some swelling and stiffness shall remain in the joints, these symptoms are to be discussed by the diligent use of the flesh-brush. Purgings immediately after a paroxysm, will be always employed with the hazard of bringing it on again.

Thus far of the **REGULAR** gout. We now proceed to consider the management of the disease when it has become **IRREGULAR**.

1. In the **atonic** gout, the cure is to be accomplished by carefully avoiding all debilitating causes; and by employing, at the same time, the means of strengthening the system in general, and the stomach in particular.

For strengthening the system in general, Dr Cullen recommends frequent exercise on horseback, and moderate walking. Cold bathing also may answer the purpose; and may be safely employed, if it appear to be powerful in stimulating the system, and be not ap-

**PRACTICE** plied when the extremities are threatened with any pain.

For supporting the tone of the system in general, when threatened with atonic gout, some animal food ought to be employed, and the more acescent vegetables ought to be avoided. In the same case, some wine also may be necessary: but it should be in moderate quantity, and of the least acescent kinds; and if every kind of wine shall be found to increase the acidity of the stomach, ardent spirits and water must be employed.

For strengthening the stomach, bitters and the Peruvian bark may be employed; but care must be taken that they be not constantly employed for any great length of time.

The most effectual medicine for strengthening the stomach is iron, which may be employed under various preparations; but the best appears to be the rust in fine powder, which may be given in very large doses.

For supporting the tone of the stomach, aromatics may be employed; but should be used with caution, as the frequent and large use of them have an opposite effect; and they should therefore be given only in compliance with former habits, or for palliating present symptoms.

When the stomach happens to be liable to indigestion, gentle vomits may be frequently given, and proper laxatives should be always employed to obviate or to remove costiveness.

In the atonic gout, or in persons liable to it, to guard against cold is especially necessary; and the most certain means of doing this, is by repairing to a warm climate during the winter-season. In the more violent cases, blistering the lower extremities may be useful; but that remedy should be avoided when any pain threatens the extremities. In persons liable to the atonic gout, issues may be established in the extremities, as in some measure a supplement to the disease.

2. A second case of the irregular gout, is the *retrocedent*.

When this affects the stomach and intestines, relief is to be instantly attempted by the free use of strong wines, joined with aromatics, and given warm; or, if these shall not prove powerful enough, ardent spirits must be employed, and are to be given in a large dose. In moderate attacks, ardent spirits, impregnated with garlic or with asa fœtida, may be employed; or, even without the ardent spirits, a solution of asa fœtida, with the volatile alkali, may answer the purpose. Opium is often an effectual remedy; and may be joined with aromatics, as in the electuary thebaicum; or they may be usefully joined with volatile alkali and camphire. Musk has likewise proved useful in this disease.

When the affection of the stomach is accompanied with vomiting, this may be encouraged, by taking draughts of warm wine, at first with water, and afterwards without it; having at length recourse, if necessary, to some of the remedies abovementioned, and particularly the opiates.

In like manner, if the intestines be affected with diarrhoea, this is to be at first encouraged by taking plentifully of weak broth; and when this shall have been done sufficiently, the tumult is to be quieted by opiates.

When the retrocedent gout shall affect the lungs, and produce asthma, this is to be cured by opiates, by antispasmodics, and perhaps by blistering on the back or breast.

When the gout, leaving the extremities, shall affect the head, and produce pain, vertigo, apoplexy, or palsy, our resources are very precarious. The most probable means of relief is, blistering the head; and, if the gout shall have receded very entirely from the extremities, blisters may be applied to these also. Together with these blisterings, aromatics, and the volatile alkali, may be thrown into the stomach.

3. The third case of the irregular gout is the *misplaced*; that is, when the inflammatory affection of the gout, instead of falling upon the extremities, falls upon some internal part. In this case, the disease is to be treated by blood-letting, and by such other remedies as would be proper in an idiopathic inflammation of the same parts.

Whether the translation so frequently made from the extremities to the kidneys, is to be considered as an instance of the misplaced gout, seems, as we have said before, uncertain: but our author is disposed to think it something different; and therefore is of opinion, that, in the *nephralgia calculosa* produced upon this occasion, the remedies of inflammation are to be employed no farther than they may be otherwise sometimes necessary in that disease, arising from other causes than the gout.

To this dissertation on the gout, taken from the works of our learned professor, we cannot help subjoining a very uncommon case published by Dr Samuel Pye in the London Medical Transactions, where the gout would seem to have been occasioned by a moribund matter, and to have been cured by the evacuation of it.

“Mr Major Rook, surgeon and apothecary in Up-pear Shadwell, of about 45 years of age, a sober, temperate man, of a good habit of body, accustomed to no disease but the gout; the returns of the fits whereof had never been more frequent than once in 12 or 14 months. About the month of June 1752, he was seized with a very severe paroxysm of the gout. As I had known some extraordinary effects, proceeding from a vegetable diet, in that distemper; particularly in one gentleman, who, by a total abstinence from all manner of food, except cow's milk, and that without bread, had cured himself of this disease; and who, at the time I mentioned the case to my friend, was in the 13th year of his milk-diet; I persuaded Mr Rook to try what vegetables would do for him: he readily complied, and entered upon it immediately, with a resolution, that, if it answered his expectation, he would renounce fish and flesh for ever.

“But after the most religious abstinence from animal food, of every kind, for eleven weeks, being visited by a gentle attack in both feet, he returned immediately to his animal-food. This paroxysm continued but 48 hours; but in March 1753, was succeeded by a very severe one in both feet.

“The pain in his feet, heels, and ankles, increased with great violence, for about 10 or 12 days; till at length he was in the most extreme agonies; such as he had never felt before, and such as almost made him mad. In the height of this extremity, the pains (it is his own expression) from the feet, heels, and ankles, flew as quick as lightning directly to the calves of his legs;

legs; but remaining there not half a minute, and not in the least abating of their extreme violence, (though the feet, heels, and ankles, were left entirely free from pain), from the calves, after a short stay of about half a minute, the pains ascended with the same velocity as before to both the thighs, at the same time leaving the calves of the legs free from pain: from the thighs, in less than the space of one minute, and as quick as before, they arrived at the abdomen; and after giving the patient one most severe twitch in the bowels, they reached the stomach: here the pains and here the fit ended, upon the patient's vomiting up about a pint and a half of a green aqueous liquor, but so extremely corrosive, that he compared it to the strongest mineral acid.

" This extraordinary crisis happened at about two in the morning: immediately after this discharge he fell asleep, and slept till seven or eight, and waked perfectly easy in every part, no signs of the distemper remaining, but the swelling and tenderness of his feet; both of which went off gradually, so that in two days he was able to walk about his business.

" The next fit seized him in February 1754, in the common way; but was less violent than the former, and continued for about six weeks; during which time he had three increased paroxysms, or distinct smart fits, which held him about two hours each; in the last of which he had the same critical discharge, by vomiting of the same corrosive matter, preceded by the same uncommon symptoms as in the fit of 1753. But mending every hour, he was able the very next day to walk, and attend his patients, with more ease than after the first-mentioned fit; for the swelling abated much sooner, and in three days disappeared.

" I have said, that this last fit was attended with three distinct paroxysms, the last of which ended as above: yet to shew the disposition of nature, in this case, to throw off the offending humour in this her new way, it is remarkable, that, in the two first of these increased paroxysms of pain, the patient declared to me that he never had the least ease till he had vomited; but as there was no translation of the pain before these vomitings, there was none of that corrosive matter to be discharged; nothing but the common contents of the stomach was to be seen. These vomitings, however, procured the patient some ease; but the fit of the gout went on till the third paroxysm was over, which ended as has been related.

" As the crisis in this case is uncommon, I must take notice of a symptom or two, which were no less extraordinary, in both these fits of the gout.

" A most profuse sweat attended the patient every morning, during the whole course of the fits; which was so very offensive, and at the same time his breath so uncommonly stinking, that neither the patient himself, nor those who waited on him, were ever sensible of the like.

" His linen was tinged as with saffron; and his urine very high coloured, of almost as deep a red as claret: but, upon the critical vomitings, every one of these symptoms disappeared with the disease.

" On the ninth of December 1755, he was attacked again in one foot. The symptoms, however, were so very mild, that he took no notice of them to his family, till the 12th: from that day the pain was aggra-

vated, and the swelling greatly increased, by walking, and riding in a coach. On the 17th it became extremely violent, particularly in the heel; when it instantaneously left the parts affected, and in the same manner and with equal velocity, (as in the two former fits,) it flew into the calves of his legs, thighs, and abdomen; and when it had reached the stomach, it caused him to vomit the same kind of corrosive acid as in the two former fits; and though the quantity was no more than a tea-spoonful, he became perfectly well in two days.

" The same symptoms of fetid urine, and offensive sweats, attended the patient in this short paroxysm, as in those of 1753 and 1754; the sweat continued but two nights, and the urine fetid only 48 hours.

" As Mr Rook had experienced so great and happy effects from the former critical vomitings, he was greatly disappointed upon finding the quantity evacuated so very small; for which reason he immediately attempted to increase it, by drinking three pints of warm water (which was at hand), but in vain; for neither that, nor the use of his finger, could provoke to an evacuation, which was begun and finished by nature: for though the quantity evacuated was so very small, yet as it was equally corrosive, and produced the same effect, the discharge must be accounted as truly critical as the others were.

" During the first of these fits, in the year 1752, a hard tumour had appeared on the side of the metatarsus near the middle of the right foot, which continued till after the third critical vomiting; when it was resolved, and totally disappeared, upon the discharge of a viscid matter, like the white of an egg, with a few small chalk-stones from the end of the middle toe of the same foot. This discharge happened about four or five days before the patient was seized with a regular fit in April 1755. But it is to be remarked, that this last fit continued three or four weeks, and went off in the common way, without any of the critical discharges of vomiting, urine, or sweat; but left on one hand three, and on the other two, fingers loaded with chalk-stones; with this peculiar symptom, that when the weather was cold those fingers were affected with a most exquisite pain, which was always removed by heat.

" But not long after this last-mentioned fit, a large quantity of chalk-stones were extracted from the bottom of the left foot, near the ball of the great toe, and that from time to time for about three or four months. On the 19th of January 1756, (the wound occasioned by the chalk-stones being still open) he was seized with a fever, without any symptom of the gout: the fever went off on the third day, with the same kind of critical sweat and urine as always accompanied the acid vomitings in the forementioned fits. On the fourth day from the attack of the fever, a fit of the gout came on, with the common symptoms, in both feet; which continued with violence for about a week, with frequent retching and vomiting, but without bringing up more than the common contents of the stomach. At this time an uncommon itching in the bottom of the foot and ball of the great toe from whence the chalk-stones had been extracted, tormented the patient for five or six hours; upon his gently rubbing the part, he was very sensible of a fluctuation of



of some matter, which soon appeared to flow at first in small quantities from the open orifice in the ball of the toe: upon pressing the part, about a tea-cup full of a liquid chalky matter was collected. The next morning the patient made a large opening with an imposthume knife, which produced more than half a pint of a bloody serous matter, full of chalk stones, which proved as truly critical as the vomitings of the corrosive acid did in the cases above-mentioned; for the orifice from whence the chalk-stones first issued, was very soon healed, and the gentleman continues in perfect health."

affected the whole; and frequently from the face it spreads over the hairy scalp, or descends on some part of the cheek. As the redness spreads, it commonly leaves, or at least is abated in the parts it had before occupied. All the parts which the redness affects are at the same time affected with some swelling, which continues for some time after the redness has abated. The whole face becomes considerably turgid; and the eye-lids are often so much swelled as entirely to shut up the eyes. When the redness and swelling have continued for some time, there commonly arise, sooner or later, blisters of a larger or smaller size on several parts of the face. These contain a thin colourless liquor, which sooner or later runs out. The surface of the skin, in the blistered places, sometimes becomes livid and blackish; but this seldom goes deeper, or discovers any degree of gangrene affecting the skin. On the parts of the face not affected with blisters, the cuticle suffers, towards the end of the disease, a considerable desquamation. Sometimes the tumour of the eye-lids ends in a suppuration.

#### 320 LXIV. ARTHROPROSIS, Genus XXV.

Lumbago psoadica, *Sauv.* sp. 6. *Fordyce*, Practice of Physic, P. II. p. 70.

Lumbago apoplematosa, *Sauv.* sp. 12.

Lumbago ab arthrocace, *Sauv.* sp. 17.

Ichias ex abscessu, *Sauv.* sp. 6.

Morbus coxarius, *De Haen*, Rat. Med. Vol. I. c. xxxii.

This is a disease very much resembling the rheumatism; but differing both from it and the gout, in that it occasions suppurations, which they seldom or never do. It frequently, according to Sauvages, attacks the muscle psoas; and occasions excruciating pains, and then collections of matter.

The only cure is, if suppuration cannot be prevented, to lay open the part where the matter is contained, which would otherwise be absorbed, and occasion a fatal hectic.

The inflammation coming upon the face does not produce any remission of the fever which had before prevailed; and sometimes the fever increases with the spreading and increasing inflammation. The inflammation commonly continues for eight or ten days; and, for the same time, the fever and symptoms attending it also continue. In the progress of the disease, the delirium and coma attending it sometimes go on increasing, and the patient dies apoplectic on the seventh, ninth, or eleventh day of the disease. In such cases it has been commonly supposed, that the disease is translated from the external to the internal parts. But Dr Callen apprehends that the affection of the brain is merely a communication from the external affection, as this continues increasing at the same time with the internal. When the fatal event does not take place, the inflammation, after having affected the whole face, and perhaps the other external parts of the head, ceases, and with that the fever also; and, without any other crisis, the patient returns to his ordinary health. This disease is not commonly contagious; but as it may arise from an acrid matter externally applied, so it is possible that the disease may sometimes be communicated from one person to another. Persons who have once laboured under this disease are liable to returns of it.

#### 321 ORDER III. EXANTHEMATATA.

Exanthemata, *Sag.* Class X.

Phlegmasie exanthematica, *Sauv.* Class III. Ord. I.

Morbi exanthematici, *Lin.* Class I. Ord. II.

Febres exanthematicae, *Vog.* Class I. Ord. II.

#### 322 GENUS XXVI. ERYSIPELAS, or St ANTHONY'S FIRE.

Erysipelas *Sauv.* gen. 97. *Lin.* 10. *Sag.* gen. 296.

Febbris erysipelacea, *Vog.* 68. *Hoffm.* II. 98.

#### LXV. ERYSIPELAS with Blisters. Sp. I.

323 Erysipelas rosa, *Sauv.* sp. 1. *Sennert de febr.* lib. ii. c. 15.

Febbris erysipelatosa, *Sydenham*, sect. vi. cap. 5.

Erysipelas typhodes, *Sauv.* sp. 2.

Erysipelas pestilens, *Sauv.* sp. 5.

Erysipelas contagiosum, *Sauv.* sp. 9.

*Description.* The erysipelas of the face, where this affection very frequently appears, comes on with a cold shivering, and other symptoms of pyrexia. The hot stage of this is frequently attended with a confusion of the head, and some degree of delirium; and almost always with drowsiness, and perhaps coma. The pulse is always frequent, and commonly full and hard.—When these symptoms have continued for one, two, or at most three days, an erythema appears on some part of the face. This at first is of no great extent; but gradually spreads from the part it first occupied to the other parts of the face, till it has

*Prognosis.* The event of this disease may be foreseen from the state of the symptoms which denote more or less the affection of the brain. If neither delirium nor coma come on, the disease is seldom attended with any danger; but when these symptoms appear early in the disease, and are in a considerable degree, the utmost danger is to be apprehended.

*Cure.* The erysipelas of the face is to be cured much in the same manner as phlegmonic inflammations; by blood-letting, cooling purgatives, and by employing every part of the antiphlogistic regimen. The evacuations of blood-letting and purging are to be employed more or less, according to the urgency of symptoms; particularly those of the pyrexia, and of those which mark an affection of the brain. As the pyrexia continues, and often increases with the inflammation of the face, so the evacuations above-mentioned

ACTIV mentioned are to be employed at any time of the disease.

In this, as in other diseases of the head, it is proper to put the patient, as often as he can easily bear it, into somewhat of an erect posture; and as in this disease there is always an external affection, so various external applications have been proposed to be made to the part affected; but almost all of them are of doubtful effect.

An erysipelas frequently appears on other parts of the body besides the face, and such other erysipelatous inflammations frequently end in suppuration; but these cases are seldom dangerous. At coming on they are sometimes attended with drowsiness, and even with some delirium; but this seldom happens, and these symptoms do not continue after the inflammation is formed; and Dr Cullen does not remember to have seen an instance of the translocation of an inflammation from the limbs to an internal part; and tho' these inflammations of the limbs be attended with pyrexia, they seldom require the same evacuations as the erysipelas of the face. It is probable, however, that this disease is sometimes attended with, or is the symptom of, a putrid fever; and in such cases the evacuations above-mentioned may be improper, and the use of the bark necessary; but our author remembers not to have seen any cases of this kind.

### 324 LXVI. ERYSIPELAS with *Phlyctena*. Sp. II.

Erysipelas zoster, *Sauv.* sp. 8.

Zona; Anglis, *The SHINGLES*, *Ruffel* de tab. gland.

p. 124. Hist. 35.

Herpes Zoster, *Sauv.* sp. 9.

This differs from the former in no other way than in being attended with an eruption of phlyctenæ or small watery bladders on several parts of the body.—The method of cure is the same.

### 325 LXVII. PESTIS, the PLAGUE. Gen. XXVII.

Pestis, *Sauv.* gen. 91. *Lin.* 2. *Junck.* 78.

Febris pestilentialis, *Vog.* 33. *Hoffm.* II. 93.

Pestis benigna, *Sauv.* sp. 2. Pestis Masiliensis,

Class III. Traité de la peste, p. 41. Ejusdem

pestis, Cl. 5ta Traité, p. 228.

Pestis remittens, *Sauv.* sp. 9.

Pestis vulgaris, *Sauv.* sp. 1. Pestis Massil. Cl. ii.

Traité, p. 38. Ejusd. Cl. iii. & iv. Traité,

p. 225, &c. *Waldschmidt.* de peste Holsatica,

apud *Halleri* Diss. Pract. tom. v. *Chenot.* de peste

Transylvanica, 1755, 1759. *De Haen*, Rat. Med.

pars xiv.

Pestis Egyptiaca, *Sauv.* sp. 11. *Alpin.* de Med.

Egypt.

Pestis interna, *Sauv.* sp. 3. Pest. Massil. Cl. I. Traité,

p. 37—224.

*Description.* Or this distemper Dr Cullen declines giving any particular history, because he never saw it; from the accounts of other authors, however, he is of opinion, that the circumstances peculiarly characteristic of it, especially of its more violent and dangerous states, are, 1. The great loss of strength in the animal functions, which often appears early in the disease. 2. The stupor, giddiness, and consequent staggering, which resembles drunkenness, or the head-ach and various delirium, all of them denote a great

disorder in the functions of the brain. 3. Anxiety, palpitation, syncope, and especially the weakness and irregularity of the pulse, denote a considerable disturbance in the action of the heart. 4. Nausea and vomiting, particularly the vomiting of bile, which shews an accumulation of vitiated bile in the gall-bladder and biliary ducts, and from thence derived into the intestines and stomach; which denote a considerable spasm, and loss of tone in the extreme vessels on the surface of the body. 5. The buboes and carbuncles, which denote an acrimony prevailing in the fluids; and, lastly, The petechiæ, hæmorrhages, and colliquative diarrhœa, which denote a putrescent tendency prevailing in a great degree in the mass of blood.

To these characteristics of the plague enumerated by Dr Cullen, we shall add one mentioned by Sir John Pringle, which, though perhaps less frequent than the others, yet seems worthy of notice. It is this, That in the plague there is an extraordinary enlargement of the heart and liver. In nine dissections of bodies dead of the plague at Marseilles, this extraordinary enlargement of the heart is taken notice of in them all, and of the liver in seven of them. The account was sent to the Royal Society by M. Didier, one of the physicians to the king of France, and hath been published in the Philosophical Transactions. In the first case, the author takes notice, that "the heart was of an extraordinary bigness; and the liver was of double the natural size.—Case 2. The heart was of a prodigious bigness, and the liver much enlarged.—Case 3. The heart double the natural bigness.—Case 4. The heart was very large, and the liver was bigger and harder than ordinary.—Case 5. The heart was of a prodigious bigness.—Case 6. The heart was larger than in its natural state; the liver also was very large.—Case 7. The heart was of a prodigious size, and the liver was very large.—Case 8. The heart was much larger than natural, and the liver of a prodigious size.—Case 9. The heart was double the natural bigness, and the liver was larger than ordinary."—This preternatural enlargement Dr Pringle thinks is owing to the relaxation of the solid parts, by which means they become unable to resist the impetus of blood, and therefore are easily extended; as in the case of infancy, where the growth is remarkably quick. And a similar enlargement he takes notice of in the scurvy, and other putrid diseases.

*Causes, &c.* From a consideration of the symptoms above-mentioned, Dr Cullen concludes, that the plague is owing to a specific contagion, often suddenly producing the most considerable debility in the nervous system or moving powers, and of a general putrefescency in the fluids.

*Prevention.* Here we must refer to all those methods of preventing and removing the incipient contagion of putrid fevers, which have been so fully enumerated. Dr Cullen is persuaded that the disease never arises in the northern parts of Europe, but in consequence of being imported from some other country. The magistrate's first care therefore ought to be to prevent the importation; and this may generally be done by a due attention to bills of health, and to the proper performance of quarantines.—With respect to the latter, he is of opinion, that the quarantines of persons

persons may with safety be much less than 40 days; and if this were allowed, the execution of the quarantine would be more exact and certain, as the temptation to break it would be in a great measure avoided. With respect to the quarantine of goods, it cannot be perfect unless the suspected goods be unpacked, duly ventilated, and other means be employed for correcting the infection they may carry; and if all this be properly done, it is probable that the time commonly prescribed for quarantine may be also shortened.

A second measure in the way of prevention is required, when an infection has reached and prevailed in any place, to prevent that infection from spreading into others. This can only be done by preventing the inhabitants or the goods of any infected place from going out of it, till they have undergone a proper quarantine.

The third measure, and which ought to be employed with great care, is, to prevent the infection from spreading among the inhabitants of a place in which it has arisen. And in this case, a great deal may be done by the magistrate, 1. By allowing as many of the inhabitants as are free from infection, and are not necessary to the service of the place, to go out of it. 2. By discharging all assemblies, or unnecessary intercourse of the people. 3. By ordering some necessary communications to be performed without contact. 4. By making such arrangements and provisions as may render it easy for the families remaining to shut themselves up in their own houses. 5. By allowing persons to quit houses where an infection appears, upon condition that they go into lazarettos. 6. By ventilating, and purifying, and destroying, at the public expence, all infected goods. 7. By avoiding hospitals, and providing separate apartments for infected persons.

The fourth and last part of the business of prevention respects the conduct of persons necessarily remaining in infected places, especially those obliged to have some communication with persons infected. Those obliged to remain in places infected, but not to have any near communication with the sick, must avoid all near communication with other persons or their goods; and it is probable, that a small distance will serve, if, at the same time, there be no stream of air to carry the effluvia of persons or goods to some distance. Those who are obliged to have a near communication with the sick ought to avoid any of the debilitating causes which render the body susceptible of infection, as a spare diet, intemperance in drinking, excess in venery, cold, fear, or other depressing passions of the mind. A full diet of animal-food is also to be avoided, because it increases the irritability of the body, and favours the operation of contagion; and indigestion, whether from the quantity or quality of the food, contributes very much to the same.

Besides these, it is probable that the moderate use of wine and spirituous liquors, moderate exercise, and the cold bath, may be of use; tonic medicines also, of which the Peruvian bark is deservedly accounted the chief, may also be used with great probability of success. If any thing is to be expected from antiseptics, Dr Cullen thinks camphire preferable to any other. In general, however, every one is to be indulged in the

medicine of which he hath the best opinion, provided it is not evidently hurtful. Whether issues be useful in preserving from the effects of contagion, Dr Cullen doth not determine.

*Cure.* Here, according to Dr Cullen, the indications are the same as in fever in general, but are not all equally important. The measures for moderating the violence of reaction, which operate by diminishing the action of the heart and arteries, have seldom any place here, excepting that the antiphlogistic regimen is generally proper. Some physicians have recommended bleeding, and Sydenham even seems to think it an effectual cure; but Dr Cullen thinks, that for the most part it is unnecessary, and in many cases might do much hurt. Purging has also been recommended; and in some degree it may be useful, in drawing off the putrescent matter frequently present in the intestines; but a large evacuation this way may certainly be hurtful.

The moderating the violence of reaction, as far as it can be done, by taking off the spasm of the extreme vessels, is a measure of the utmost necessity in the cure of the plague; and the whole of the means formerly mentioned, as suited to this indication, are extremely proper. The giving an emetic, at the first approach of the disease, would probably be of great service; and it is probable, that, at some other periods of the disease, emetics might be useful, both by evacuating bile abounding in the alimentary canal, and by taking off the spasm of the extreme vessels.

From some principles with respect to fever in general, and with respect to the plague in particular, our author is of opinion, that after the exhibition of the first vomit, the body should be disposed to sweat; but this sweat should be raised only to a moderate degree, though it must be continued for 24 hours or more if the patient bears it easily. The sweating is to be excited and conducted according to the rules laid down under *SYNCHIA*; and must be promoted by the plentiful use of diluents rendered more grateful by vegetable acids, or more powerful by being impregnated with some portion of neutral salts. To support the patient under the continuance of the sweat, a little weak broth, acidulated with the juice of lemons, may be given frequently, and sometimes a little wine if the heat of the body be not considerable. If sudorific medicines are judged necessary, opiates will be found most effectual and safe; but they should not be combined with aromatics, and probably may be more effectual if joined with a portion of emetics and of neutral salts. But if, notwithstanding the use of emetics and sudorifics in the beginning, the disease should still continue, the cure must turn upon the use of means for obviating debility and putrescency; and for this purpose tonic medicines, especially the Peruvian bark, and cold drinks, are the most proper. For the treatment of buboes and carbuncles, see the article *SURGERY*.

GENUS XXVIII. VARIOLA; the SMALL-POX.

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*Variola*, *Sauv.* gen. 92. *Lin.* 3. *Sag.* gen. 290.  
*Febris variolosa*, *Vog.* 35. *Hoffm.* 11. 49.  
*Variolæ*, *Boerh.* 1371. *Juncq.* 76.

LXVIII



LXVII. The *Distinct* SMALL-POX. Sp. I.

- Variola discreta benigna, *Sauv.* sp. 2.  
 Variolæ regulares discretæ, *Sydenh.* sect. iii. cap. 2.  
 Variolæ discretæ simplices, *Helvet.* Obs. sp. 1.  
 Variola discreta complicata, *Sauv.* sp. 2. *Helvet.* sp. 2.  
 Variolæ anomalæ, *Sydenh.* sect. iv. cap. 6.  
 Variola discreta dyenterioris, *Sauv.* sp. 4. *Sydenh.* sect. iv. cap. 1.  
 Variola discreta vesicularis, *Sauv.* sp. 5.  
 Variola discreta crystallina, *Mead* de variol. cap. 2.  
 Variola discreta verrucosa, *Sauv.* sp. 6. *Mead* ibid.  
 Variola discreta filiquosa, *Sauv.* sp. 7. *Freind* Oper. p. 358.  
 Variola discreta miliaris, *Sauv.* sp. 8. *Helvet.* Obs. sp. 3.

328 LXVIII. The *Confluent* SMALL-POX. Sp. II.

- Variola confluens, *Sauv.* sp. 9.  
 Variolæ regulares confluentes, ann. 1667. *Sydenham.* sect. iii. cap. 2.  
 Variolæ confluentes simplices, *Helvet.* Obs. sp. 1.  
 Variola confluens crystallina, *Sauv.* sp. 10.  
 Variola japonica, *Kempfer.*  
 Vesiculæ Divæ Barbaræ, *C. Pif.* obs. 149.  
 Variola confluens maligna, *Helvet.* Obs. sp. 1.  
 Variola confluens coherens, *Sauv.* sp. 11.  
 Variola confluens maligna, *Helvet.* sp. 2.  
 Variola confluens nigra, *Sauv.* sp. 12. *Sydenham.* sect. v. cap. 4.  
 Variola confluens maligna, *Helvet.* sp. 3.  
 Variola guinea, *Mead* de variolis, cap. 2.  
 Variola confluens corymbosa, *Sauv.* sp. 13.  
 Variola confluens maligna, *Helvet.* sp. 4.

*Description.* In the distinct small-pox, the disease begins with a synocha or inflammatory fever. It generally comes on about mid-day, with some symptoms of a cold stage, and commonly with a considerable languor and drowiness. A hot stage is soon formed, and becomes more considerable on the second and third day. During this course children are liable to frequent startings from their slumbers; and adults, if they are kept a-bed, are disposed to much sweating. On the third day, children are sometimes affected with one or two epileptic fits. Towards the end of the third day the eruption commonly appears, and gradually increases during the fourth; appearing first on the face, and successively on the inferior parts, so as to be completed over the whole body on the fifth day. From the third day the fever abates, and against the fifth it entirely ceases. The eruption appears first in small red spots hardly eminent, but by degrees rising into pimples. There are generally but few on the face; but, even when more numerous, they are separate and distinct from one another. On the fifth or sixth day, a small vesicle, containing an almost colourless fluid, appears on the top of each pimple. For two days these vesicles increase in breadth only, and there is a small hollow pit in their middle, so that they are not raised into spheroidal pustules till the eighth day. These pustules from their first formation continue to be surrounded with an exactly circular inflamed margin, which when they are numerous diffuses

some inflammation over the neighbouring skin, so as to give somewhat of a damask-rose colour to the spaces between the pustules. As the pustules increase in size, the face swells considerably if they are numerous on it; and the eye-lids particularly are so much swelled, that the eyes are entirely shut. As the disease proceeds, the matter in the pustules becomes by degrees more opaque and white, and at length assumes a yellowish colour. On the eleventh day, the swelling of the face is abated, and the pustules seem quite full. On the top of each a darker spot appears; and at this place the pustule, on the eleventh day, or soon after, is spontaneously broken, and a portion of the matter oozes out; in consequence of which the pustule is shrivelled, and subsides; while the matter oozing out dries, and forms a crust upon its surface. Sometimes only a little of the matter oozes out, and what remains in the pustule becomes thick and even hard. After some days, both the crusts and the hardened pustules fall off, leaving the skin which they covered of a brownish red colour; nor doth it resume its natural colour till many days after. In some cases, where the matter of the pustules has been more liquid, the crusts formed by it are later in falling off, and the part they covered suffers some desquamation, which occasions a small hollow or pit in it.

On the legs and hands the matter is frequently absorbed; so that at the height of the disease, these pustules appear as empty as vesicles. On the tenth and eleventh days, as the swelling of the face subsides, a swelling arises in the hands and feet; but which again subsides as the pustules come to maturity. When the pustules on the face are numerous, some degree of pyrexia appears on the tenth and eleventh days, but disappears again after the pustules are fully ripened; or perhaps remains in a very slight degree till the pustules on the feet have finished their course; and it is seldom that any fever continues longer in the distinct small-pox. When the pustules are numerous on the face, upon the sixth or seventh day some uneasiness in the throat, with a hoarseness of the voice, comes on, and a thin liquid is poured out from the mouth. These symptoms increase with the swelling of the face; and the liquids of the mouth and throat becoming thicker are with difficulty thrown out; and there is at the same time some difficulty in swallowing, so that liquids taken in to be swallowed are frequently rejected or thrown out by the nose. But all these affections of the fauces are abated as the swelling of the face subsides.

In the confluent small-pox all the symptoms above-mentioned are much more severe. The eruptive fever particularly is more violent; the pulse is more frequent and more contracted, approaching to that state of pulse which is observed in typhus. The coma is more considerable, and there is frequently a delirium. Vomiting also frequently attends, especially at the beginning of the disease. In very young infants epileptic fits are sometimes frequent on the first days of the disease, and sometimes prove fatal before any eruption appears, or they usher in a very confluent and putrid small-pox. The eruption appears more early on the third day, and it is frequently preceded or accompanied with an erysipelatous efflorescence. Sometimes the eruption appears in clusters like the measles. When the eruption is completed, the

pimples are always more numerous upon the face, and at the same time smaller and less eminent. Upon the eruption the fever suffers some remission, but never goes off entirely; and after the fifth or sixth day it increases again, and continues to be considerable throughout the remaining part of the disease. The vesicles formed on the top of the pimples appear sooner; and while they increase in breadth, the do not retain a circular, but are every way of an irregular figure. Many of them run into one another, inasmuch that very often the face is covered with one vesicle rather than with a number of pustules. The vesicles, as far as they are anyway separated, do not arise to a spheroidal form, but remain flat, and sometimes the whole of the face is of an even surface. When the pustules are in any measure separated, they are not bounded by an inflamed margin, but the part of the skin that is free from pustules is commonly pale and flaccid. The liquor that is in the pustules changes from a clear to an opaque appearance, and becomes whitish or brownish, but never acquires the yellow colour and thick consistency that appears in the distinct small-pox. The swelling of the face, which only sometimes attends the distinct small-pox, always attends the confluent kind; it also comes on more early, and arises to a greater height, but abates considerably on the tenth or eleventh day. At this time the pustules or vesicles break and shrivel; pouring out at the same time a liquor, which is formed into brown or black crusts, which do not fall off for a long time after. Those of the face, in falling off, leave the skin subject to a dequamation, which pretty certainly produces pittings. On the other parts of the body the pustules of the confluent small-pox are more distinct than on the face; but never acquire the same maturity and consistence of pus as in the properly distinct kind. The salivation, which sometimes only attends the distinct small-pox, very constantly attends the confluent; and both the salivation and the affection of the fauces above-mentioned, are, especially in adults, in a higher degree. In infants a diarrhoea comes frequently in place of a salivation.

In this kind of small-pox there is often a very considerable putrescency of the fluids, as appears from petechiae, serous vesicles, under which the skin shews a disposition to gangrene, and from bloody urine or other hemorrhages; all of which symptoms frequently attend this disease. In the confluent small-pox also, the fever, which had only suffered a remission from the eruption to the maturation, at or immediately after this period is frequently renewed again with considerable violence. This is what has been called the *secondary fever*, and is of various duration and event.

*Cause, &c.* It is evident that the small-pox is originally produced by a contagion; and that this contagion is a ferment with respect to the fluids of the human body, which assimilates a great part of them to its own nature; and it is probable, that the quantity thus assimilated is, in proportion to their several bulks, nearly the same in different persons. This quantity passes again out of the body, partly by insensible perspiration, and partly by being deposited in pustules; but if the quantities generated be nearly equal, the quantities passing out of the body the two ways above-mentioned are very unequal in different persons. The

causes which determine more of the variolous matter to pass by perspiration, or to form pustules, are probably certain circumstances of the skin, which determine more or less of the variolous matter to stick in it, or to pass freely through it. The circumstance of the skin which seems to determine the variolous matter to stick in it, is a certain state of inflammation depending much on the heat of it: thus we have many instances of parts of the body, from being more heated, having a greater number of pustules than other parts. Thus parts covered with plaisters, especially those of the stimulant kind, have more pustules than others.—Certain circumstances also, such as adult age, and full living, determining to a phlogistic diathesis, seem to produce a greater number of pustules, and *vice versa*. It is therefore probable, that an inflammatory state of the whole system, and more particularly of the skin, gives occasion to a greater number of pustules; and the causes of this may produce most of the other circumstances of the confluent small pox, such as the time of eruption, the continuance of the fever, the effusion of a more putrescent matter and less fit to be converted into pus, together with the form and other circumstances of the pustules.

*Prognosis.* The more exactly the disease retains the form of the distinct kind, it is the safer; and the more completely the disease takes the form of the confluent kind, it is the more dangerous. It is only when the distinct kind shews a great number of pustules on the face or otherwise, by fever or putrescency, approaching to the circumstances of the confluent, that the distinct kind is attended with any danger.

In the confluent kind the danger is always very considerable: and the more violent and permanent the fever is, the greater the danger; and especially in proportion to the increase of the symptoms of putrescency. When the putrid disposition is very great, the disease sometimes proves fatal before the eighth day; but in most cases death happens on the eleventh, and sometimes not till the fourteenth or seventeenth day.

Though the small-pox may not prove immediately fatal, the more violent kinds are often followed by a morbid state of the body, sometimes of very dangerous event. These consequences, according to Dr Cullen, may be imputed sometimes to an acrid matter produced by the preceding disease, and deposited in different parts; and sometimes to an inflammatory diathesis produced and determined to particular parts of the body.

*Cure.* The art of medicine hath never yet afforded a method of preventing the eruption of the small-pox after the contagion is received; all that can be done is, to render the disease more mild, which is generally effected by *INOCULATION*. It is not to be supposed that the mere giving of the infection artificially could make any difference in the nature of the disease, was it not that certain precautions are commonly used in the case of those who are inoculated, which cannot be used in the case of those who receive them naturally. These measures, according to Dr Cullen, are, chiefly the following.

1. The choosung for the subject of inoculation persons otherwise free from disease, and not liable from their age or otherwise to any incidental disease.

2. The

2. The choosing that time of life which is most favourable to a mild disease.

3. The choosing for the practice a season most favourable to a mild disease.

4. The preparing the person to be inoculated, by enjoining abstinence from animal-food for some time before inoculation.

5. The preparing the person by courses of mercurial and antimonial medicines.

6. The taking care at the time of inoculation to avoid cold, intemperance, fear, or other circumstances which might aggravate the future disease.

7. After these preparations and precautions, the choosing a fit matter to be employed in inoculation, by taking it from a person of a sound constitution, and free from any disease, or suspicion of it; by taking it from a person who has had the small-pox of the most benign kind; and lastly, by taking the matter from such person as soon as it has appeared in the pustules, either on the part inoculated, or on other parts of the body.

8. The introducing, by inoculation, but a small portion of the contagious matter.

9. After inoculation, the continuing of the vegetable diet, and the employment of mercurial and antimonial medicines, and at the same time employing frequent purging.

10. Both before and after inoculation, taking care to avoid external heat, either from the sun, artificial fires, warm chambers, much clothing, or being much in bed; and, on the contrary, exposing the person to a free and cool air.

11. Upon the appearance of the eruptive fever, the rendering that moderate by the employment of purgatives; by the use of cooling and antiseptic acids; and especially by exposing the person frequently to a cool, and even a cold air, at the same time giving freely of cold drink.

12. After the eruption, the continuing the application of cold air, and the use of purgatives, during the course of the disease, till the pustules are fully ripened.

On these measures Dr Cullen observes, that, as the common infection may often seize persons under a diseased state, which may render the small-pox more violent, it is evident that inoculation must have a great advantage by avoiding such concurrence. But as the avoiding of this may in the mean time frequently leave persons exposed to the common infection, it is well worth while to inquire what are the diseased states which should refrain from the practice of inoculation. This is not yet sufficiently ascertained: for it hath been observed, that the small-pox has often occurred with a diseased state of the body, without being thereby rendered more violent; and it hath also been observed, that some diseases of the skin are equally innocent. Our author is of opinion, that they are diseases of the febrile kind, or such ailments as induce or aggravate a febrile state, that especially give the concurrence which is most dangerous with the small-pox. He is also of opinion, that though a person be in a diseased state, if that state be of uncertain nature and effect, and at the same time the small-pox are very common in the neighbourhood, so that it must be extremely difficult to guard against the common infection, it will always be safer

to give the small-pox by inoculation than to leave the person to take them by the common infection.

Though inoculation hath been practised with safety upon persons of all ages, yet there is reason to conclude, that adults are more liable to a violent disease than persons of younger years. At the same time it is observed, that children, in the time of their first dentition, are liable, from the irritation of that, to have the small-pox rendered more violent; and that infants, before the time of dentition, upon receiving the contagion of the small-pox are liable to be afflicted with epileptic fits, which frequently prove fatal. Hence it is evident, that though circumstances may admit and approve of inoculation at any age, yet for the most part it will be advantageous to choose persons after the first dentition is over, and before the time of puberty. The operation of inoculation may be performed at any season of the year; yet as it is certain that the cold of winter may increase the inflammatory, and the heats of summer increase the putrescent, state of the small-pox, it is highly probable that inoculation may have some advantage from avoiding the extremes either of cold or heat.

As the use of animal-food may increase both the inflammatory and putrescent state of the human body, so it must render persons, in receiving the contagion of the small-pox, less secure against a violent disease; and therefore inoculation may derive some advantage by enjoining abstinence from animal-food for some time before the operation is performed: but Dr Cullen is of opinion, that a longer time is necessary than what is commonly prescribed.

Mercurial and antimonial preparations may have some effect in determining to a more free perspiration, and therefore may be of some use in preparing a person for the small-pox; but there are many observations which render their use doubtful. The quantity of both these medicines, particularly the antimony, commonly employed, is too inconsiderable to have any effects. Mercurials indeed have been often employed more freely; but even their salutary effects have not been evident, and they have sometimes been evidently productive of mischief. It is therefore much to be doubted, whether inoculation really derives any benefit from these preparatory courses or not.

It has been often observed, in the case of almost all contagions, that cold, intemperance, fear, and some other circumstances, concurring with the application of the contagion, have greatly aggravated the future disease; it must undoubtedly be the same in the case of the small-pox: and it is certain that inoculation must derive a great advantage, perhaps its principal one, from avoiding the concurrences above-mentioned.

It has commonly been supposed, that inoculation derives some advantage from the choice of the matter employed in it; but it is very doubtful if any choice be here necessary, or can be of any benefit in determining the state of the disease. It is not indeed probable that there is any difference of contagion producing the small-pox; for there are innumerable instances of the contagion arising from a person who labours under the distinct small-pox producing the confluent kind, and the contrary. Since the practice of inoculation hath been introduced, it hath also been



observed, that the same variolous matter would in one person produce the distinct, and in another the confluent small-pox. It is therefore highly probable, that the difference of the small-pox does not depend upon any difference of the contagion, but upon some difference in the state of the persons to whom it is applied, or in the state of certain circumstances concurring with the application of the contagion.

Some have supposed, that inoculation has an advantage over the natural infection, by introducing only a small portion of contagious matter into the body; but this is by no means well ascertained. It is not known what quantity of contagion is introduced into the body by the common infection of the small-pox; and it is probable the quantity is not great: nor, though it were larger than that thrown in by inoculation, is it certain what the effects would be. A certain quantity of ferment may be necessary to excite fermentation in a given mass; but when that quantity is given, the fermentation and assimilation are extended to the whole mass; and we do not find that a greater quantity than is just necessary, either increases the activity of the fermentation, or more certainly secures the assimilation of the whole. In the case of the small-pox, a considerable difference in the quantity of the contagion introduced, hath not shewn any effects in modifying the disease.

Purging has the effect of diminishing the activity of the sanguiferous system, and of obviating the inflammatory state of it; and therefore it is probable, that the frequent use of cooling purgatives gives a considerable advantage to the practice of inoculation; and probably this is also obtained by diminishing the determination to the skin. It seems also probable, that mercurials and antimonials are useful only as they make part of the purging course.

It is probable that the state of the small-pox depends very much upon the state of the eruptive fever, and particularly in avoiding the inflammatory state of the skin; and therefore it is also probable, that the measures taken for moderating the eruptive fever, and inflammatory state of the skin, afford the greatest improvement which has been made in the practice of inoculation. The tendency of purging, and the use of acids to this purpose, is sufficiently obvious: and upon the same grounds we should suppose that blood-letting might be useful; but probably this has been omitted, and perhaps other remedies might be so, since we have found a more powerful and effectual one in the application of cold air and the use of cold drink.

It hath been the practice of inoculators to continue the use of purgatives and the application of cold air after the eruption; but it cannot be said to give any particular advantages to inoculation, and the employment of purgatives seems often to have led to an abuse. When the state of the eruption is determined, when the number of pustules is very small, and the fever hath entirely ceased, the safety of the disease may be said to be ascertained, and further remedies absolutely superfluous: in such cases therefore the use of purgatives is unnecessary, and may be hurtful.

It remains now only to consider the treatment of the small-pox, when the symptoms shall be violent, as may sometimes happen, even after inoculation and

every remedy and precaution have been used. The cause of this is not ascertained, but it seems to be a putrescent tendency of the fluids. When therefore, from the prevailing of small-pox as an epidemic, and more especially when it is known that a person not formerly affected with the disease has been exposed to the infection, if such person should be attacked with the symptoms of fever, there can be little doubt that it is the fever of the small-pox, and therefore he is to be treated in every respect as if he had received the disease by inoculation. He is to be freely exposed to cool air, to be purged, and to have cooling acids given liberally. If these measures moderate the fever, nothing more is necessary: but if the nature of the fever be uncertain; or if, with suspicions of the small-pox, the fever be violent; or even if, knowing the distemper to be the small-pox, the measures above-mentioned do not moderate the fever sufficiently; venesection will be proper; and more especially if the person be an adult, of a plethoric habit, and accustomed to full living. In the same circumstances it will always be proper to give a vomit; which is useful in the beginning of all fevers, and especially in this, where a determination to the stomach appears by pain and spontaneous vomiting.

It frequently happens, especially in infants, that, during the eruptive fever of the small-pox, convulsions occur. Of these, if only one or two fits appear on the evening preceding the eruption, they give a prognostic of a mild disease, and require no remedy; but if they occur more early, are violent, and frequently repeated, they are very dangerous, and require a speedy remedy; and here bleeding and blistering are of no service, the only effectual medicine is an opiate given in a large dose.

These are the remedies necessary during the eruptive fever; and if, upon the eruption, the pustules on the face are distinct, and their number few, the disease requires no further remedies. But when, upon the eruption, the number of pimples on the face is considerable, when they are not distinct; and especially if, upon the fifth day, the fever does not suffer a considerable remission; the disease still requires a great deal of attention.

If, after the eruption, the fever shall still continue, the avoiding of heat and the continuing to expose the body to a cool air will still be proper. If the fever is considerable, with a full hard pulse, in an adult person, a bleeding will be necessary, and more certainly a cooling purgative: but it will be seldom necessary to repeat the bleeding, as a loss of strength very soon comes on; but the repetition of a purgative, or the frequent use of laxative glysters, is commonly advantageous.

When a loss of strength, with other marks of a putrescent tendency of the fluids, appears, the Peruvian bark must be given in substance, and in large quantity. In the same case, the use of acids and of nitre is advantageous, and commonly it is proper also to give wine very freely. From the fifth day of the disease throughout the whole course of it, it is proper to give an opiate once or twice a-day; taking care at the same time to obviate coliciveness, by purgatives or by laxative glysters. From the eighth to the eleventh day of a violent disease, it will be proper to lay on blisters

successfully on different parts of the body, and that without regard to the parts being covered with pustules. Blisters are also to be applied to the external fauces, in case of difficult deglutition, and viscid saliva and mucus, which are thrown out with difficulty, at the same time that detergent gargles are to be diligently used. During the whole course of this disease, when a considerable fever is present, antimonial medicines may be given in nauseating doses with advantage, and these commonly answer the purpose of purgatives.

The remedies above-mentioned are frequently proper from the fifth day till the suppuration is finished. But as after that period the fever is sometimes continued and increased; or as sometimes, when there was little or no fever before, a fever now arises and continues with considerable danger; this is called the *secondary fever*, and requires a particular treatment.

When the secondary fever follows the distinct small-pox, and the pulse is full and hard, the case is to be treated as an inflammatory affection, by bleeding and purging; but the secondary fever which follows the confluent kind, is to be considered as a putrid disease, and bleeding is improper. Some purging may be necessary, but the remedies to be chiefly depended upon are the Peruvian bark and acids. When the secondary fever first appears, whether after a distinct or confluent small-pox, it is useful to exhibit an antimonial emetic in nauseating doses, but in such a manner as to produce some vomiting. For avoiding the pits which frequently follow the small-pox, no method hitherto proposed seems to be sufficiently certain.

On the subject of inoculation, Baron Dimisdale, a very celebrated writer, informs us, that were it left to his choice, he would decline inoculating children under two years old; because within that period they are exposed to all the dangers of dentition, fevers, fluxes, convulsions, and other accidents, sufficiently difficult in themselves to manage in such tender subjects.

Besides, as already observed, convulsive paroxysms often accompany the variolous eruptive fever in children; and though generally looked upon in no unfavourable light, as often preceding a distinct kind of small-pox, yet they are at all times attended with some degree of danger: nay, many have expired under them; while others, who have struggled through with great difficulty, have been so debilitated, and their faculties so impaired, that the effects have continued during the remaining part of their lives.

It ought also to be considered, that young children have usually a larger share of pustules from inoculation, than those who are advanced a little farther in life; under which circumstance many have died: that it seems most prudent to wait till this dangerous period be over, especially as its duration is so short, that the danger of their receiving the small-pox in the natural way, before this time expires, is very little; and it is easier to preserve them from it, than when they are left more to themselves, and may be more exposed to infection. But children above this period may be inoculated with greater freedom; nor does there appear any reason to exclude healthy adults of any age; persons of 70 having passed thro' this process with the utmost ease and safety.

In regard to constitution, Baron Dimisdale observes,

that greater liberties may be taken than were formerly judged admissible. Persons afflicted with various chronic complaints, of scrophulous, scorbutic, and arthritic habits; persons of unwieldy corpulence, and of intemperate, irregular lives; have all passed through this disease with as much facility as the most temperate, healthy, and regular. But those who labour under any acute or critical disease, or its effects, are obviously unfit and improper subjects. So likewise are those in whom are evident marks of corrosive acrimonious humours, or who have an evident debility of the whole frame from inanition or any other cause. All such require to be treated in a particular manner previous to the introduction of this disease. Constitutions disposed to frequent returns of intermittents, seem likewise justly exceptionable; especially as the preparatory regimen may in some habits increase this tendency. Baron Dimisdale, however, has known instances of severe ague-fits attacking persons between the infection of the matter and the eruption of the pox, and even during maturation, when the Peruvian bark has been given liberally and with much success; the principal business, in the mean time, suffering no injury or interruption.

Among the circumstances generally considered as more or less propitious to inoculation, the season of the year has been reckoned a matter of some importance. Spring and autumn have been generally recommended, as being the most temperate seasons; the cold of winter, and the summer-heats, having been judged unfavourable for this purpose. But the Baron remarks, that experience does not justify those opinions; for, according to the best observation he has been able to make, inoculated persons have generally had more pustules in spring than at any other time of the year; and epidemic diseases being commonly most frequent in autumn, especially fluxes, intermittents, and ulcerated sore throats (all which are liable to mix more or less with the small-pox), the autumn, upon this account, does not seem to be the most favourable season in general.

Our author's opinion is, that considering the surprising and indisputable benefits arising at all times to patients in the small-pox, from the free admission of fresh cool air and evacuations, we may safely inoculate at all seasons, provided care be taken to screen the patients as much as possible from heat in summer, and to prevent them from keeping themselves too warm and too much shut up, as they are naturally disposed to do, from the weather in winter. When seasons, however, are marked with any peculiar epidemics, of such a kind especially as may render a mild disease more untractable, it may perhaps be most prudent not to inoculate while such diseases are prevalent.

In directing the preparatory regimen, Baron Dimisdale principally aims at the following points, *viz.* To reduce the patient, if in high health, to a lower and more secure state; to strengthen the constitution, if too low; to correct what appears vitiated; and to clear the stomach and bowels, as much as may be, from all crudities and their effects. With this view he orders such of his patients as constitute the first class abovementioned, and who are by much the majority, to live in the following manner: To abstain from all animal food, including broths, also butter and cheese;

and

and from all fermented liquors, excepting small beer, which is allowed sparingly; and from all spices, and whatever is endued with a manifest heating quality. The diet is to consist of pudding, gruel, sago, milk, rice-milk, fruit-pies, greens, roots, and vegetables of any of the kinds in season, prepared or raw. Eggs, though not to be eaten alone, are allowed in puddings, and butter in pye-crust. The patients are to be careful that they do not eat such a quantity as to overload their stomachs, even of this kind of food. Tea, coffee, or chocolate, are permitted for breakfast, to those who choose or are accustomed to them.

In this manner they are to proceed about nine or ten days before the operation; during which period, at nearly equal distances, they are directed to take three doses of the following powder, either made into pills or mixed with a little syrup or jelly, at bed-time, and a dose of Glauber's salt dissolved in thin water-gruel, each succeeding morning.

The powder is composed of eight grains of calomel, the same quantity of the compound powder of crab's-claws, and one eighth part of a grain of emetic tartar. Instead of the latter, Baron Dimisdale has sometimes substituted two grains of precipitated sulphur of antimony. In order to facilitate the division of the doses, a large quantity is prepared at once, and great care taken that the several ingredients be well mixed.

This quantity is usually sufficient for a healthy strong man; and the dose must be lessened for women or children, according to their age and strength, as well as for persons advanced in years.

The first dose is generally ordered at the commencement of the course; the second, three or four days after; and the third about the eighth or ninth day. The Baron chooses to inoculate the day after the last dose has been taken. On the days of purging, broths are allowed, and the patients are desired to abstain from unprepared vegetables.

What has been said concerning the preparation, must be considered as proper only for the young or middle-aged, in a good state of health: but among those who are desirous of inoculation are often found tender, delicate, and weakly women; men of bad stamina, valetudinarians by constitution, by illness, or intemperance; also aged persons, and children; and for all such a very different treatment must be directed. Here a milder course of medicine, rather of the alterative than purgative kind, is preferable; and in many instances, an indulgence in some light animal-food, with a glass or two of wine in case of lowness, is not only allowable, but necessary to support a proper degree of strength, especially in advanced age.

Children whose bowels are often tender, and ought not to be ruffled by strong purges, yet require a mild mercurial, and bear it well. Besides emptying the bowels of crudities, it is a good security against worms and their effects, which sometimes produce very alarming and even fatal disorders.

Inattention to the particular state of health of those who are entering upon the preparatory course, has been productive of great mischief. This is chiefly observable respecting the indiscreet use of mercurials, by which a salvation has often been raised, to the risk of impairing good constitutions, and the ruin of such as were previously weak and infirm. The di-

stinctions and treatment necessary, will be obvious to PRACTICE those who are acquainted with the animal-æconomy and medical practice.

The time of menstruation has generally been the guide in respect to the inoculation of women, that the whole of the disease might be over within the menstrual period. Baron Dimisdale informs us, that he observes this rule, when he can choose his time without any inconvenience, and he inoculates soon after the evacuation ceases; tho' he has no reason to decline performing the operation at any time.

Women with child have likewise been inoculated, and done well; but the state of pregnancy seems unfavourable to the process, which ought therefore not to be hazarded without some urgent reason. Baron Dimisdale has not inoculated any woman whom he knew to be pregnant; but on some who concealed their pregnancy he has performed the operation, without producing a miscarriage, the hope of which event, he suspects, had rendered them desirous of the process. One of those had a child born nine weeks after inoculation, at the full time, with distinct marks of the disease, though the mother had very few eruptions.

The manner most usually practised in this country for communicating the small-pox by inoculation, has of late been the following: A thread is drawn through a ripe pustule, and well moistened with matter. A piece of this thread is insinuated into a superficial incision made in one or both arms, near the part where issues are usually fixed; and being covered with a plaster, is there left for a day or two.

Very different methods of inoculation, however, are pursued; two of which Baron Dimisdale has frequently practised and describes; but he informs us, that the following has proved so invariably successful, as to induce him to give it the preference.

The patient to be infected being in the same house, and, if no objection is made to it, in the same room, with one who has the disease, a little of the variolous matter is taken from the place of insertion, if the subject be under inoculation; or a pustule, if in the natural way, on the point of a lancet, so that both sides of the point are moistened.

With this lancet an incision is made in that part of the arm where issues are usually placed, deep enough to pass thro' the scarf-skin, and just to touch the skin itself; and in length as short as possible, not more than one eighth of an inch.

The little wound being then stretched open between the finger and thumb of the operator, the incision is moistened with the matter, by gently touching it with the flat side of the infected lancet. This operation is generally performed in both arms, and sometimes in two places in one arm, a little distant from each other. For as Baron Dimisdale has not observed any inconvenience from two or three incisions, he seldom trusts to one; that neither he nor his patient may be under any doubt about the success of the operation from its being performed in one place only.

Baron Dimisdale has also tried the following method, with the same success as that above described; but he does not so much approve of it, because he has been credibly informed that it has sometimes failed in the practice of others. A lancet being moistened with the variolous fluid in the same manner as in the other,



is gently introduced, in an oblique manner, between the scarf and true skin, and the finger of the operator is applied on the point, in order to wipe off the infection from the lancet, when it is withdrawn. In this method, as well as in the former, a little blood will sometimes appear; but Baron Dimisdale neither draws blood with design, nor does he think there is any necessity of wiping it off before the matter is introduced.

In both these ways of inoculating, neither plaster, bandage, nor covering is applied, nor in any respect necessary.

Baron Dimisdale informs us, that those methods of producing this disease have never once failed him; and experience has sufficiently proved that there is no danger from additional infection by the natural disease at the same time. He therefore makes no scruple of having the person to be inoculated, and the person from whom the infection is to be taken, in the same room; nor has he ever observed any ill consequence attending this practice. But he advises the inoculated patients (tho' perhaps there is no necessity for that precaution) to be afterwards separated from places of infection till certain signs of success appear, when all restraint is removed, there being then no danger from accumulation.

Baron Dimisdale remarks, that it seems to be of no consequence whether the infecting matter be taken from the natural or inoculated small-pox. He has used both, and never has been able to discover the least difference, either respecting the certainty of infection, the progress, or the event. He therefore takes the infection from either, as opportunity offers, or at the option of the patients or their friends.

Neither is it of any consequence whether the matter be taken before, or at the crisis of, the distemper. It is generally supposed, that the small-pox is not infectious till after the matter has acquired a certain degree of maturity; and in the common method of inoculation this is so much attended to, that when the operation has proved ineffectual, the failure has been ascribed to the unripeness of the matter.

But, as the author remarks, it appears very clearly from the present practice of inoculation, that so soon as any moisture can be taken from the infected part of an inoculated patient, previous to the appearance of any pustules, and even previous to the eruptive fever, this moisture is capable of communicating the small-pox with the utmost certainty. Baron Dimisdale has taken a little clear fluid from the elevated pellicle on the incised part, even so early as the fourth day after the operation; and has at other times used matter fully digested at the crisis, with equal success. In general, however, he prefers taking the matter for infection during the eruptive fever, as he supposes it at that time to have its utmost activity.

In all cases, when he takes matter from an inoculated person, it is from the place where it was infected; as he is always sure to find infection there if the disease succeeds, and always of sufficient energy.

It may appear strange that no bandage, dressing, or application whatsoever, is used to the part infected; but that the most simple incision being made, and moistened with the smallest particle of the recent fluid matter, the whole is committed to nature. This method, however, the baron observes, is perfectly right:

because the application of either plaster or unguent, as is the usual practice, will occasion an inflammation on some skins; and, in all, tend to disfigure the natural appearance of the incision, and prevent our forming a proper judgment of the progress of the infection.

If neither an inoculated patient be at hand, nor any one in the neighbourhood has a distinct kind of the natural disease, a thread may be used as in the common manner, provided it be very recently infected; but baron Dimisdale is of opinion, that the thread ought to be used as soon as possible after being charged with infecting matter.

The following method of introducing the disease has likewise been found effectual: Dip the point of a lancet in varolous matter; let it be held in the air till it is dry; after which it may be put up and kept in the common case, without any farther care. With this prepared lancet raise the scarf-skin obliquely, and keep the lancet a little time in motion between the two skins, that part of the matter may be mixed with the animal-juices; then withdraw the lancet, and leave the incision uncovered as before.

A due attention to the progress of infection, discoverable by the part where the operation was performed, is a necessary circumstance; because a just prognosis may thence be sometimes formed of the future state of the distemper, and indications may be taken from the different appearances on the arm, that will enable us to prevent inconveniences.

Our author observes, that the former method of covering the place of incision with a plaster, and continuing upon it dressings of one sort or other, prevented much useful information of this kind. They precluded any judgment by the touch, and sometimes rendered that by the eye equivocal.

The day after the operation is performed, though it takes effect, little alteration is discoverable. On the second day, if the part be viewed with a lens, there generally appears a kind of orange-coloured stain about the incision, and the surrounding skin seems to contract. At this time Baron Dimisdale usually gives the following medicine at going to bed, either mixed with a little of any kind of jelly, or more frequently made into a pill.

Calomel, and compound powder of crabs-claws, of each three grains; emetic tartar, one-tenth of a grain.

A quantity of this medicine should be carefully prepared at once, in order to make the division more exact.

On the fourth or fifth day, upon applying the finger, a hardness is perceptible to the touch. The patient feels an itching on the part, which appears slightly inflamed; and under a kind of vesication is seen a little clear fluid, the part resembling a superficial burn. About the sixth, most commonly some pain and stiffness is felt in the axilla; a circumstance which not only foretells the near approach of the eruptive symptoms, but is a sign of a favourable progress of the disease. Sometimes on the seventh, oftener on the eighth day, symptoms of the eruptive fever appear; such as slight remitting pains in the head and back, succeeded by transient shiverings and alternate heats, which continue in a greater or less degree till the eruption be perfected. At this time also it is usual for the pa-

tient to complain of a very disagreeable taste in his mouth, the breath is always fetid, and there ensues a small peculiar to the various eruptive fever.

The inflammation in the arms at this time spreads fast; and, upon viewing it with a good glass, the incision for the most part appears surrounded with an infinite number of small confluent pustules, which increase in size and extent as the disease advances. On the tenth or eleventh day, a circular or oval efflorescence is usually discovered surrounding the incision, and extending sometimes near half round the arm, but more frequently to about the size of a shilling; and being under the cuticle, is smooth to the touch and not painful. This appearance also is favourable. It accompanies eruption; every disagreeable symptom ceases; and at the same time it certainly indicates the whole affair to be over, the pain and stiffness in the axilla also going off.

The febrile symptoms are for the most part so mild, as seldom to require any assistance, except a repetition of the same medicine that was directed on the second night after the operation; and next morning the following laxative draught should be given, to procure three or four stools.

Infusion of sena two ounces, manna half an ounce, tincture of jalap two drachms.

These are given as soon as the eruptive symptoms are perceptible, if they seem to indicate any uncommon degree of vehemence.

It has been observed that by attending to the progress of infection, we may in general be able to prognosticate with some degree of certainty the issue of the distemper. Particular incidents will ever happen, but not sufficient to invalidate the propriety of general rules.

If the appearances already described are observed early, a very favourable event may be expected; but it happens in some cases; that the success of the inoculation is barely perceptible, the colour about the wound remaining pale, instead of changing to red or inflamed; the edges of the incision spread but little, they remain almost entirely flat, and are attended neither with itching nor uneasiness of any kind. Nay, sometimes on the fifth, and even the sixth day, the alteration is so little as to render it doubtful whether the infection has taken place.

When matters are in this state, the appearance is unfavourable, implying a late and more untoward disease: To prevent which, Baron Dimsdale directs the powder or pill to be taken every night; and in case it fails to operate by stool, or there be the least disposition to costiveness, an ounce of Glauber's salts, or more commonly the laxative draught already mentioned, is given in the morning, once or twice, as the case may require. This course forwards the inflammation, which is always a desirable circumstance; it being constantly observed, that an early progress on the arm, and an early commencement of the eruptive complaints, portend that the distemper will be mild and favourable; and on the contrary, when both are late, the symptoms are usually more irregular and unfavourable.

The management recommended by Baron Dimsdale at the period of eruption differing essentially from that of former practitioners, and being a matter of

great importance, he gives the following explicit directions on this head, advising that they may be pursued with firmness and moderation.

Instead of the patient being confined to his bed or his room, when the symptoms of the eruptive fever come on, he is directed, as soon as the purging medicine has operated, to keep abroad, as much as he can bear, in the open air, be it ever so cold; always taking care not to stand still, but to walk about moderately while abroad. He is also directed, if thirsty, to drink cold water.

Baron Dimsdale observes, that this treatment seems as hard at first to the patients as it must appear singular to those who are unacquainted with such practice; but the effects are so salutary, so constantly confirmed by experience, and an easy progress through every stage of the disease depends so much upon it, that he admits of no exception, unless the weather be extremely severe and the constitution very delicate. He adds, it is indubitably true, that, in the few instances where the symptoms of eruption have run very high, the patients being averse to any motion, and fearing the cold as the greatest evil; yet when, under those circumstances, he has persuaded them to rise out of bed, and go out of doors, though led sometimes by two assistants, and has allowed them to drink as much cold water as they chose, they have not suffered the least unfavourable accident: on the contrary, after they have been prevailed upon to comply with those directions, they find their spirits revived; an inclination for nourishment returns; they rest well; a gentle sweat succeeds, accompanied with a favourable eruption; and the fever seems to be entirely extinguished.

In general, the complaints in this state are very moderate, and attended with so little illness that the patient eats and sleeps well the whole time. A few pustules appear, sometimes equally disposed; sometimes the inflammations on the arms spread, and are surrounded with a few pustules, which gradually advance to maturity; during which time, for the most part, the eruption proceeds kindly, and there is much more difficulty to restrain the patients within due bounds, and prevent their mixing with the public, thereby spreading the infection, than there was at first to prevail upon them to go abroad. During this time medicine is seldom wanted; the cool air seems the best cordial; and if any uncommon languor happens, a basin of small broth, or a glass of wine, is allowed in the day, or some white-wine whey at bed-time; which are indeed at any time allowed to tender, aged, or weakly persons.

With those exceptions, the patients are hitherto kept very scrupulously to the diet at first directed. But after the eruption is completed, they are, if occasion requires, indulged in a little well-boiled meat of the lightest kind, as chicken, veal, or mutton.

The above-mentioned regimen, the cooling alternative purges, and the free use of cool air at the season of eruption, almost universally prevent either alarming symptoms or a large crop of pustules. Baron Dimsdale has seen a few with such a quantity of pustules, though distinct, that he has neither advised nor allowed them to go out of the house. But the generality of his patients, when the eruptions are few, amuse them-

practice themselves abroad, within proper limits, with the pustules upon them.

This practice, however, the Baron neither enjoins, nor maintains to be necessary; but he has not been able to observe that any inconvenience has arisen from it. He also informs us, that, how strange soever it may appear, those who are most adventurous, seem to enjoy better spirits, and are more free from complaints, than others who are inclined to keep within doors.

Those who have the disease in the slightest manner first described, viz. without any appearance of eruption but on the inoculated part, are soon permitted to go about their usual affairs: and many instances have happened of very industrious poor men, who have immediately returned to their daily labour, with a caution not to intermix with those who have not had the distemper, for fear of spreading it; and with injunctions to take, two or three times, of the purge already directed, or as many doses of Glauber's salts. Those who have the disease in a greater degree, are confined somewhat longer; and, if there be the least disposition to costiveness, a very mild laxative is now and then exhibited; as the progress to maturation appears rather to be advanced than retarded by such means.

When the maturation is completed, and there is nothing farther to fear from the distemper, Baron Dimsdale allows his patients gradually to change their course of diet, from the perfectly cooling kind, to one a little more generous; recommending strictly to all a return to their ordinary animal-diet, with much caution and restraint upon their appetites, both in respect of food and fermented liquors.

He observes it is not often that we are under a necessity of making any application to the part where the insertion of the variolous matter was made. It most commonly heals up, and is covered with a scab, about the time when, in a natural way, all the pox would have been dried up. But in some cases the incisions continue to discharge a purulent matter a longer time. In these instances it is sufficient to cover the part with the white cerate, or any other mild emplastick substance, which may at once prevent the linen from adhering to the sore, and defend it from the air. As in these cases the part remains unhealed from some peculiar cause in the habit, it will be necessary to give gentle purgatives, and proper alteratives, as particular exigencies may require.

After describing the usual progress of the small-pox from inoculation, Baron Dimsdale remarks that there are frequent deviations from this course, which may embarrass an unexperienced practitioner, and create a real difficulty, as well as apprehensions of danger. He therefore proceeds to relate the means for removing those symptoms, and the doubts respecting the event.

The symptom he first notices, and which, though it very rarely happens, sometimes gives much trouble, is great sickness, accompanied with vomiting, in the eruptive state of the disease. For this complaint it is always necessary in the first place to clear the stomach; which may be effected, either by ordering the patient to drink plentifully of warm liquids to promote vomiting; or perhaps more properly, by giving to an adult one grain of emetic tartar, mixed with ten

grains of compound powder of crabs-claws; taking care to diminish the dose for very young and weak subjects.

This usually throws off some bilious matter by vomit, sometimes procures stools, or occasions a moderate sweat, and generally administers relief. If, however, no stools should follow from this medicine, and the sickness should remain, a gentle laxative almost certainly procures a respite, and the appearance of the eruption entirely removes the complaint.

Another deviation, of yet greater consequence, which sometimes happens towards the time of the eruption, and is often, though not always, accompanied with great sickness, is an erysipelatous efflorescence. If this shews itself on the skin partially, and here and there in patches, it is not very alarming, and soon wears off. But sometimes the whole surface of the body is covered with a rash intimately mixed with the variolous eruption, and so much resembling the most malignant kind of confluent small-pox as scarcely to be distinguished from it. In some such cases, accompanied with petechiæ and livid spots, Baron Dimsdale has been much alarmed; not being able by inspection only, though assisted by glasses, to determine whether what he saw was an inoffensive rash, or tokens of the greatest malignity. Very strict attention, however, has enabled him to distinguish the difference clearly; and for assisting others in such a discrimination, he makes the following remarks.

The real and essential difference is to be gathered from the concomitant symptoms. In the erysipelatous or variolous rash, there is not so much fever, nor is the restlessness or pain of the head or loins so considerable, neither is there that general prostration of strength; all which are usual attendants on a confluent small-pox, especially when accompanied with such putrid appearances. Besides, upon a careful examination, there may sometimes be discerned a few distinct pustules, larger than the rest, mixed with the rash, which are the real small-pox. In those cases the patients are ordered to refrain from cold water, or any thing cold; and to keep within doors, but not in bed. If any sickness yet remains, a little white-wine whey, or other temperate cordial, is advised; and this method has been so generally successful, as to prevent any alarming complaint. After two or three days, the skin changes from a florid to a dusky colour, a few distinct pustules remain, and advance properly to maturation, without any farther trouble ensuing from this formidable appearance.

This rash has often been mistaken for the confluence it so much resembles; and has afforded occasion for some practitioners, either ignorantly or disingenuously, to pretend, that, after a very copious eruption of the confluent pox, they can by a specific medicine discharge the greater part of the pustules, leaving only as many distinct ones as may satisfy the patient that he has the disease.

Baron Dimsdale informs us, that rashes of the kind above described frequently happen during the preparation (whether owing to the regimen, or medicine, or both, he does not determine), and cause the operation to be postponed. But he has observed, that in such cases they are apt to return at the time of the eruption of the small-pox.



In general, as has been already said, the symptoms which precede eruption commence at the end of the seventh or on the eighth day inclusive from the operation; but it often happens that they appear much sooner, and sometimes much later than this period. Baron Dimdale has seen some cases in which the disease has come on so suddenly after infection, and with so little complaint or uneasiness, that the whole affair has been terminated, purges taken, and the patient returned home perfectly well, in a week; before others, inoculated at the same time, from the same patient, and under the same circumstances, have begun to complain.

In this case, the inoculated part shews early certain marks of infection, sometimes on the very next day, or the day after, when the incision will often appear considerably inflamed and elevated. The patient about this time frequently makes some of the following complaints, viz. chilliness, itchings, and slight pricking pains in the arm, and sometimes on the shoulder; giddiness, drowsiness, and a slight head-ach, sometimes attended with a feverish heat, but often without any. The account themselves give of their feelings is, in some, as if they had drank too much, and in others, as if they had caught a cold. Those complaints seldom last 24 hours, often not so long, and with frequent intermissions; never, so far as our author remembers, rising to a degree that requires confinement. During the continuance of those complaints, the inflammation of the arm advances apace, and feels hard to the touch; but upon their wearing off, the inflamed appearances gradually diminish, and the part dries to a common small scab; the skin, that was before red, turns livid, and the disease entirely vanishes. In some instances, those symptoms attack much later; even on the seventh or eighth day, when an eruption might be expected in consequence of them, yet none appears; but the arm gets well very soon, and the disease is at an end.

In this irregular sort of the disorder there have, however, been some examples where a few eruptions have appeared, and probably in consequence of the inoculation: yet the pustules have not looked like the true pox, neither have they matured like them, nor lasted longer than three days; about which time, for the most part, they have dried away.

When this irregular kind of the disease first occurred in Baron Dimdale's practice, he was in doubt whether the patients were quite secure from any future attacks of the distemper. In order to be satisfied on this point, he inoculated them a second time, causing them to associate with persons in every stage of the disease, and to try all other means of catching the infection. This method has been practised with the generality of such patients ever since, yet without a single instance of its producing any disorder. Baron Dimdale, therefore, now makes no scruple of pronouncing them perfectly safe; and experience has enabled him to foretell, for the most part, in two or three days after the operation, whether the disease will pass in this slight manner.

Upon the second inoculation, however, the incised parts are uncommonly inflamed for a day or two, just in the same manner as has in numerous instances been observed, as well in those who, though certain of ha-

ving had the small-pox in the natural way, have submitted to inoculation for the sake of experiment, as in others, who, being doubtful whether they have had the disease or not, have been inoculated in order to be satisfied. But in all such cases, the parts soon became well; nor did any of those appearances which have been described as the constant attendants on inoculation, as pain in the head, giddiness, marks of infection in the arm, &c. ensue. Neither can those appearances ever be produced upon a person who has had the small-pox before, either in the natural way, or by inoculation.

Another irregularity deserving notice is, that sometimes upon the abatement of the fever and other symptoms, after the appearance of several pustules, and when the eruptive stage of the disease seems completed, it nevertheless happens that fresh eruptions come out, and continue doing so daily, for four, five, or even six days successively; preceded sometimes by a slight pain in the head, though more frequently they appear without any new disturbance. Those are generally few, of short duration, and seldom come to maturity. Baron Dimdale, however, has seen four cases, in which, after a cessation of complaints, and an appearance of few pustules, the eruptive stage of the disease was thought to be over, yet in two or three days a fresh fit of fever has attacked the patients, and after a short illness a quantity of new pustules has broke out far exceeding the first number, and those remained and matured completely.

Some of the Baron's own patients, and, as he has been credibly informed, of other inoculators, have had considerable eruptions of this kind after they returned home; which have probably given occasion for the reports of several having had the disease in the natural way after inoculation. But in confirmation that those reports are ill-grounded, our author observes, that in all the cases of this sort which have occurred in his own practice, or, as far as he can learn, in that of others; the second, or latter crop of pustules, has always happened within the time usually allowed for the progress of the small-pox from inoculation; before the inflammation on the arm has ceased, and sooner than we can suppose them to have been produced by infection received in the natural way. When this has happened, it has been to persons in whom after a slight eruption and abatement of symptoms, the disease has prematurely been judged to be quite over, and they have therefore been permitted to return to their families.

Baron Dimdale next considers the consequences that arise from this very cool and repelling method, and how far the patient's future state of health may be affected by a practice so opposite to established theory.

In has been the general opinion, that in most or all eruptive complaints, especially the small-pox, the rational method of cure was to forward, by every gentle means, the efforts of nature in producing an eruption; and on the contrary, that there was danger in checking it, either by cold air, cold drink, or any considerable evacuations. For this purpose the use of warm diluents, and the lying in bed, especially if the fever and symptoms run high, or at least continuing to the house, have been generally approved and recommended. Experience, however, has now sufficiently confirmed



name of this distemper; and the writers of our own country scarce mention any thing more of it than its name. Morton speaks of it as if he supposed it to be a very mild genuine small-pox. But these two distempers are surely totally different from one another, not only on account of their different appearances above-mentioned, but because those who have had the small-pox are capable of being infected with the chicken-pox; but those who have once had the chicken-pox are not capable of having it again, though to such as have never had this distemper, it seems as infectious as the small-pox. Dr Heberden wetted a thread in the most concocted pus-like liquor of the chicken-pox which he could find; and after making a slight incision, it was confined upon the arm of one who had formerly had it; the little wound healed up immediately, and shewed no signs of any infection.

From the great similitude between the two distempers, it is probable, that, instead of the small-pox, some persons have been inoculated from the chicken-pox; and that the distemper which has succeeded, has been mistaken for the small-pox by hasty or unexperienced observers.

There is sometimes seen an eruption, concerning which our author is in doubt, whether it be one of the many unnoticed cutaneous diseases, or only a more malignant sort of chicken-pox.

This disorder is preceded for three or four days by all the symptoms which forerun the chicken-pox; but in a much higher degree. On the fourth or fifth day the eruption appears, with very little abatement of the fever; the pains likewise of the limbs and back still continue, to which are joined pains of the gums. The pocks are redder than the chicken-pocks, and spread wider; and hardly rise so high, at least not in proportion to their size. Instead of one little head or vesicle of a ferous matter, these have from four to ten or twelve. They go off just like the chicken-pox, and are distinguishable from the small-pox by the same marks; besides which, the continuance of the pains and fever after the eruption, and the degree of both these, though there be not above 20 pocks, are what never happen in the small-pox.

*Description.* This disease begins with a cold stage, which is soon followed with a hot, with the ordinary symptoms of thirst, heat, anorexia, anxiety, sickness, and vomiting; and these are more or less considerable in different cases. Sometimes from the beginning, the fever is sharp and violent; often, for the first two days, it is obscure and inconsiderable; but always becomes violent before the eruption, which commonly happens on the fourth day. This eruptive fever, from the beginning of it, is always attended with hoarseness, a frequent hoarse dry cough, and frequently with some difficulty of breathing. At the same time, the eyelids are somewhat swelled; the eyes are a little inflamed, and pour out tears; and, with this, there is a coryza, and frequent sneezing. For the most part, a constant drowsiness attends the beginning of this disease. The eruption, as we have said, commonly appears upon the fourth day, first on the face, and successively on the lower parts of the body. It appears first in small red points; but, soon after, a number of these appear in clusters, which do not arise in visible pimples, but, by the touch, are found to be a little prominent. This is the case on the face; but, in other parts of the body, the prominence, or roughness, is hardly to be perceived. On the face, the eruption retains its redness, or has it increased for two days; but, on the third, the vivid redness is changed to a brownish red; and, in a day or two more, the eruption entirely disappears, while a mealy desquamation takes place. During the whole time of the eruption, the face is somewhat turgid, but seldom considerably swelled. Sometimes, after the eruption has appeared, the fever ceases entirely: but this is seldom the case; and more commonly the fever continues or is increased after the eruption, and does not cease till after the desquamation. Even then the fever does not always cease, but continues with various duration and effect. Though the fever happens to cease upon the eruption's taking place, it is common for the cough to continue till after the desquamation, and sometimes much longer. In all cases, while the fever continues, the cough also continues, generally with an increase of the difficulty of breathing; and both of these symptoms sometimes arise to a degree which denotes a pneumonic affection. This may arise at any period of the disease; but very often it does not come on till after the desquamation of the eruption.

After the same period, also, a diarrhoea frequently comes on, and continues for some time.

It is common for measles, even when they have not been of a violent kind, to be followed by inflammatory affections, particularly ophthalmia and phthisis. If the blood be drawn from a vein in the measles, with the circumstances necessary to favour the separation of the gluten, this always appears separated, and lying on the surface of the crassamentum, as in inflammatory diseases. For the most part, the measles, even when violent, are without any putrid tendency; but in some cases, such a tendency appears both in the course of the disease, and especially after the ordinary course of it is finished. See Dr Watson, in London Med. Obs. vol. iv. art. 11.

*Causes.* The measles are occasioned by some kind of contagion, the nature of which is not understood; and which, like the former, affects a person only once in

330 Genus XXX. RUBEOLA; the MEASLES.

Rubeola, *Sauv.* gen. 94. *Lin.* 4. *Sag.* 293.

Febris morbillosa, *Veg.* 36. *Hoffm.* II. 62.

Morbilli, *Junck.* 76.

331 LXX. The Regular MEASLES. Sp. I.

Rubeola vulgaris, *Sauv.* sp. 1.

Morbilli regulares, *Sydenh.* Sect. iv. cap. 5.

332 LXXI. The Irregular or Anomalous MEASLES, Var. 1.

Rubeola anomala, *Sauv.* sp. 2.

Morbilli anomali, *Sydenh.* Sect. v. cap. 3.

333 LXXII. The MEASLES attended with Quinsy Var. 2.

334 LXXIII. The MEASLES with Putrid Diathesis of the Blood. Var. 3.

335 LXXIV. The VARILODES, in Scotland commonly called the Nirles. Sp. II.

Rubeola variolodes, *Sauv.* sp. 3.



PRACTICE in their lives.

*Prognosis.* From the description of this distemper already given, it appears that the measles are attended with a catarrhal affection, and by an inflammatory diathesis to a considerable degree; and therefore the danger of them is to be apprehended chiefly from the coming on of a pneumonic inflammation.

*Cure.* From the consideration mentioned in the prognosis, it will be obvious, that the remedies especially necessary are those which may obviate and diminish the inflammatory diathesis; and therefore, in a particular manner, blood-letting. This remedy may be employed at any time in the course of the disease, or after the ordinary course of it is finished. It is to be employed more or less, according to the urgency of the symptoms of fever, cough, and dyspnoea; and generally may be employed very freely. But, as the symptoms of pneumonic inflammation seldom come on during the eruptive fever; and, as this is sometimes violent, immediately before the eruption, though a sufficiently mild disease be to follow; bleeding is seldom very necessary during the eruptive fever, and may often be reserved for the times of greater danger which are perhaps to follow.

In all cases of measles, where there are no marks of putrescency, and where there is no reason, from the known nature of the epidemic, to apprehend putrescency, bleeding is the remedy to be depended upon: but assistance may also be drawn from cooling purgatives; and particularly from blistering on the sides, or between the shoulders. The dry cough may be alleviated by the large use of demulcent pectorals, mucilaginous, oily, or sweet. It may, however, be observed, with respect to these demulcents, that they are not so powerful in involving and correcting the acrimony of the mafs of blood as has been imagined; and that their chief operation is by besmearing the fauces, and thereby defending them from the irritation of acrids, either arising from the lungs, or distilling from the head. For moderating and quieting the cough in this disease, opiates certainly prove the most effectual means, whenever they can be safely employed. In the measles, in which an inflammatory state prevails in a considerable degree, opiates may be supposed to be inadmissible; and, in those cases in which a high degree of pyrexia and dyspnoea shew either the presence, or at least the danger, of pneumonic inflammation, opiates might be very hurtful: but, in cases in which the dyspnoea is not considerable, and in which bleeding, to obviate or abate the inflammatory state, has been duly employed; in such cases, while the cough and watchfulness are the urgent symptoms, opiates may be safely exhibited, and with great advantage. In all the exanthemata, there is an acrimony diffused over the system, which gives a considerable irritation; and, for obviating the effects of this, opiates are useful, and always proper, when no particular contra-indication prevails.

When the desquamation of the measles is finished, though then there should be no disorder remaining, physicians have thought it necessary to purge the patient several times, with a view to draw off the dregs of this disease, that is, a portion of the morbid matter which is supposed to remain long in the body. Dr Cullen doth not reject this supposition; but, at the same

time, cannot believe that the remains of the morbid matter, diffused over the whole mass of blood, can be wholly drawn off by purging; and therefore thinks, that, to avoid the consequence of the measles, it is not the drawing off the morbid matter which we need to study, so much as to obviate and remove the inflammatory state of the system which had been induced by the disease. With this last view, indeed, purging may still be a proper remedy; but bleeding, in proportion to the symptoms of inflammatory disposition, is still more so.

From our late experience of the use of cold air in the eruptive fever of the small pox, some physicians have been of opinion that the practice may be transferred to the measles; but we have not yet had experience to determine this. We are certain, that external heat may be very hurtful in the measles, as in most other inflammatory diseases; and, therefore, that the body ought to be kept in a moderate temperature during the whole course of the measles: but how far, at any period of the disease, cold air may be applied with safety, we are uncertain. Analogy, though so often the resource of physicians, is frequently fallacious; and further, though the analogy with the small-pox might lead to the application of cold air during the eruptive fever of the measles, the analogy with catarrh seems to be against the practice. When the eruption is upon the skin, we have had many instances of cold air making it disappear, and thereby producing much disorder in the system; and we have also had frequent instances of this disorder's being removed by restoring the heat of the body, and thereby again bringing out the eruption.

Upwards of 20 years ago, inoculation for the measles was proposed, and practised in several instances with success, by Dr Home of Edinburgh. His method of communicating the infection was, by applying, to an incision in each arm, cotton moistened with the blood of a patient labouring under the measles. But the contagion hath since been artificially induced by means of lint wet with the tears which flow from the eyes in the first stage of this disorder. Thus, it is said, the soreness of the eyes was mitigated, the cough abated, and the fever rendered less severe. But the practice was never much in fashion, and now is scarce ever heard of.

#### LXXV. THE MILIARY FEVER. Genus XXXI.

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*Miliaria, Lin. 7.*

*Miliaris, Sauv. gen. 95. Sag. gen. 295.*

*Febris miliaris, Pögg. 37.*

*Febris purpurata rubra et alba miliaris, Hoffm. II. 68.*

*Febris purpurea seu miliaris, Junck. 75.*

*Germanis der Friesel. God. Welsch, Hist. Med. de novo puerperarum morbo, qui der Friesel dicitur, Lips. 1655.*

*Hamilton, de febr. miliar. 1710. Fatonus, de febr.*

*mil. 1747. Allioni de miliar. 1758. Fordyce, de febr. mil. 1748. Fischer, de febr. mil. 1767. De*

*Haen, de divis. febr. 1760, et in Ratio med. passim. Matt. Collin ad Baldinger de miliar. 1764.*

*Miliaris benigna, Sauv. sp. 1.*

*Miliaris maligna, Sauv. sp. 2.*

*Miliaris recidivans, Sauv. sp. 3.*

Miliaria

- Miliaris Germanica, *Sauv.* sp. 5.  
 Miliaris Boia, *Sauv.* sp. a.  
 Miliaris Britannica, *Sauv.* sp. f.  
 Miliaris nova febris, *Sydenh.* Sched. monit. *Sauv.* sp. d.  
 Miliaris sudatoria, *Sauv.* sp. e.  
 Miliaris nautica, *Sauv.* sp. g.  
 Miliaris purpurata, *Sauv.* sp. h.  
 Miliaris lactea, *Sauv.* sp. c.  
 Miliaris puerperarum, *Sauv.* sp. k.  
 Miliaris scorbutica, *Sauv.* sp. l.  
 Miliaris critica, *Sauv.* sp. b.

*History and Description.* This disease is said to have been unknown to the ancients, and that it appeared for the first time in Saxony about the middle of the last century. It is said to have since spread from thence into all the other countries of Europe; and, since the period mentioned, to have appeared in many countries in which it had never appeared before.

From the time of its having been first taken notice of, it has been described and treated of by many different writers; and by all of them, till very lately, has been considered as a peculiar idiopathic disease. It is said to have been constantly attended with peculiar symptoms. It comes on with a cold stage, which is often considerable. The hot stage, which follows, is attended with great anxiety, and frequent sighing. The heat of the body becomes great, and soon produces profuse sweating, preceded, however, with a sense of pricking, as of pin-points in the skin; and the sweat is of a peculiar rank and disagreeable odour. The eruption appears sooner or later in different persons, but at no determined period of the disease. It seldom or never appears upon the face; but appears first upon the neck and breast, and from thence often spreads over the whole body.

The eruption named *miliary* is said to be of two kinds; the one named the *red*, the other the *white miliary*. The former, which in English is strictly named a *rash*, is commonly allowed to be a symptomatic affection; and, as the latter is the only one that has any pretensions to be considered as an idiopathic disease, it is this only that we shall more particularly describe and treat of in this chapter.

What is then called the *white miliary eruption*, appears at first like the red, in very small red pimples, for the most part distinct, but sometimes clustered together. Their little prominence is better distinguished by the finger than by the eye. Soon after the appearance of this eruption, and, at least, on the second day, a small vesicle appears upon the top of the pimples. At first the vesicle is whey-coloured; but soon becomes white, and stands out like a little globule on the top of the pimple. In two or three days, these globules break, or are rubbed off; and are succeeded by small crusts, which soon after fall off in small scales. While one set of pimples take this course, another set arise to run the same, so that the disease often continues upon the skin for many days together. Sometimes when one crop of this eruption has disappeared, another, after some interval, is produced. And, it has been further observed, that, in some persons, there is such a disposition to this disease, that they have been

affected with it several times in the course of their lives.

This disease is said to affect both sexes, and persons of all ages and constitutions; but it has been observed at all times to affect especially, and most frequently, lying-in women.

It is often accompanied with violent symptoms, and has frequently proved fatal. The symptoms, however, attending it are very various; and they are, upon occasion, every one attending febrile diseases; but no symptom, or concurrence of symptoms, are steadily the same in different persons, so as to give any specific character to the disease. When the disease is violent, the most common symptoms are phrenetic, comatose, and convulsive affections, which are also symptoms of all fevers treated by a very warm regimen.

While there is such a variety of symptoms appearing in this disease, it is not to be expected that any one particular method of cure can be proposed; and, accordingly, we find in different writers different methods and remedies prescribed; frequent disputes about the most proper; and those received and practised by some, opposed and deserted by others.

It appears, however, to Dr Cullen, very improbable that this was really a new disease, when it was first considered as such. There are very clear traces of it in authors who wrote long before that period; and though there were not, we know that ancient descriptions were inaccurate and imperfect, particularly with respect to cutaneous affections; and we know very well that those affections which commonly appeared as symptomatic only, were commonly neglected, or confounded together under a general appellation.

The antecedent symptoms of anxiety, sighing, and pricking of the skin, which have been spoken of as peculiar to this disease, are, however, common to many others; and, perhaps, to all those in which sweatings are forced out by a warm regimen. Of the symptoms said to be concomitant of this eruption, there are none which can be said to be constant and peculiar but that of sweating. This, indeed, always precedes and accompanies the eruption; and, while the miliary eruption attends many different diseases, it never, however, appears in any of these, but after sweating; and in persons labouring under the same diseases it does not appear, if in such persons sweating is avoided. It is, therefore, probable, that the eruption is the effect of sweating; and that it is the effect of a matter not before prevailing in the mass of blood, but generated under particular circumstances in the skin itself. That it depends upon particular circumstances of the skin, appears further from hence, that the eruption seldom or never appears upon the face, although it affects the whole of the body besides; and that it comes upon those places especially which are more closely covered; and that it can be brought out upon particular places by external applications.

It is to be observed, that this eruptive disease differs from the other exanthemata in many circumstances; in its not being contagious, and therefore never epidemic; in this the eruption appears at no determined period of the disease; that the eruption has no determined duration; that successive eruptions frequently appear in the course of the same fever, and that such eruptions frequently recur in the course of the same person's life. All this renders it very probable, that,

in the military fever, the morbid matter is not a subsisting contagion communicated to the blood, and thence, in consequence of fever and assimilation, thrown out upon the surface of the body, but a matter occasionally produced in the skin itself by sweating.

This conclusion is further rendered probable from hence, that, while the military eruption has no symptoms or concurrence of symptoms peculiar to itself, it, upon occasion, accompanies almost every febrile disease, whether inflammatory or putrid, if these happen to be attended with sweating; and from thence it may be presumed, that the military eruption is a symptomatic affection only, produced in the manner we have said.

But, as this symptomatic affection does not always accompany every instance of sweating, it may be proper to inquire, what are the circumstances which especially determine this eruption to appear? And to this our author gives no full and proper answer. He cannot say that there is any one circumstance which in all cases gives occasion to this eruption; nor can he say what different causes, in different cases, may give occasion to it. There is only one observation that can be made to the purpose of this inquiry; and it is, that these persons sweating, under febrile diseases, are especially liable to the military eruption, who have been previously weakened by large evacuations, particularly of blood. This will explain why it happens to lying-in-women more frequently than to any other persons; and to confirm this explanation, he has observed, that the eruption has happened to other women, though not in child-bed, but who had been much subjected to a frequent and copious menstruation, and to an almost constant *fluor albus*. He has also observed it to have happened to men in fevers, after wounds from which they had suffered a great loss of blood.

Further, that this eruption is produced by a certain state of debility, will appear probable, from its so often attending fevers of the putrid kind, which are always attended with great debility. It is true, that it also sometimes attends inflammatory diseases, when it may not be accounted for in the same manner; but he believes it may be observed, that it especially attends those inflammatory diseases in which the sweats have been long protracted, or frequently repeated, and which have thereby produced a debility, and perhaps a debilitating putrid diathesis.

It appears so clearly that this eruption is always a symptomatic and factitious affection, that our author is persuaded it may be, in most cases, prevented merely by avoiding sweats. Spontaneous sweatings, in the beginning of diseases, are very rarely critical; and all sweatings, not evidently critical, should be prevented; and the promoting them, by increasing external heat, is commonly very pernicious. Even critical sweatings should hardly be encouraged by such means. If, therefore, spontaneous sweats arise, they are to be checked by the coolness of the chamber; by the lightness and looseness of the bed-cloaths; by the persons laying out their arms and hands; and by their taking cold drink; and in this way our author thinks he has frequently prevented military eruptions, which were otherwise likely to have appeared, particularly in lying-in-women.

But it may happen, when these precautions have

been neglected, or from other circumstances, that a military eruption does not actually appear; and the question will then be put, how the case is to be treated? It is a question of consequence; as our author believes that the matter here generated is often of a virulent kind; it is often the offspring of putrefescency; and, when treated by increasing the external heat of the body, it seems to acquire a virulence which produces those symptoms mentioned above, and proves certainly fatal.

It has been an unhappy opinion with most physicians, that eruptive diseases were ready to be hurt by cold; and that it was therefore necessary to cover up the body very closely, and thereby increase the external heat. We now know that this is a mistaken opinion; that increasing the external heat of the body is very generally mischievous; and that several eruptions not only admit, but require the application of cold air. He is persuaded, therefore, that the practice which formerly prevailed in the case of military eruptions, of covering up the body closely, and both by external means and internal remedies encouraging the sweatings which accompany this eruption, was highly pernicious, and commonly fatal. He is therefore of opinion, that even when a military eruption has appeared, in all cases in which the sweating is not manifestly critical, we should employ all the several means of stopping the sweating that are mentioned above; and he has sometimes had occasion to observe, that even the admission of cool air was safe and useful.

This is, in general, the treatment of military eruptions: but at the same time, the remedies suited to the primary disease are to be employed; and therefore, when the eruption happens to accompany inflammatory affections, and the fulness and hardness of the pulse or other symptoms shew an inflammatory state present, the case is to be treated by blood-letting, purging, and other antiphlogistic remedies.

Upon the other hand, when the military eruption attends diseases, in which debility and putrefescency prevail, it will be proper to avoid all evacuations, and to employ tonic and antiseptic remedies, particularly the Peruvian bark, cold drink, and cold air.

We shall conclude this subject with observing, that the venerable octogenarian practitioner, de Fischer, when treating of this subject, in laying down the indications of cure, has given this as one of them: "Excretionis periphericæ non primariam habere rationem."

#### GENUS XXXII. SCARLATINA. The SCARLET FEVER. 337

*Scarlatina*, Sauv. gen. 98. Vog. 39. Sag. 294. Junck. 75.

LXXVI. The MILD SCARLET FEVER. Sp. I. 338  
*Scarlatina febris*, Sauv. sp. 1. Sydenham, sect. vi. cap. 2.

LXXVII. The SCARLET FEVER with Ulcerated Sore Throat. Sp. II. 539  
*Scarlatina anginosa*. Withering on the Scarlet Fever.

THE mild scarlet fever is described by Sydenham, who tells us that he can scarce account it a disease; and indeed nothing more seems to be necessary



cessary in the treatment of it than an antiphlogistic regimen, avoiding the application of cold air and cold drink. The disease however sometimes rages epidemically, and is attended with very alarming symptoms, bearing no small resemblance to the *cynanche maligna*, in which case it is called *scarlatina anginosa*.—The best description of this distemper hath been published by Dr Withering in the year 1778. This disease made its appearance, we are told, at Birmingham and the neighbouring villages, about the middle of May 1778. It continued in all its force and frequency to the end of October; varying, however, in some of its symptoms, as the air grew colder. In the beginning of November it was rarely met with; but towards the middle of that month, when the air became warmer, it increased again, and in some measure resumed those appearances it possessed in the summer-months, but which it had lost during the cold winds in October.

It affected children more than adults; but seldom occurred in the former under two years of age, or in the latter when once they had passed their fiftieth year.

*Description.* With various general symptoms of fever, the patient at first complains of a dejection of spirits, a slight soreness or rather stiffness in the neck, with a sense of straitness in the muscles of the neck and shoulders, as if they were bound with chords. The second day of the fever this soreness in the throat increases, and the patients find a difficulty in swallowing; but the difficulty seems less occasioned by the pain excited in the attempt, or by the straitness of the passage, than by an inability to throw the necessary muscles in action. The skin feels hot and dry, but not hard; and the patients experience frequent, small, pungent pains, as if touched with the point of a needle. The breath is hot and burning to the lips, and thirst makes them wish to drink; but the tendency to sickness, and the exertions necessary in deglutition, are so unpleasant, that they seldom care to drink much at a time. They have much uneasiness also from want of rest during the night. In the morning of the third day, the face, neck, and breast, appear redder than usual: in a few hours this redness becomes universal; and increases to such a degree of intensity, that the face, body, and limbs, resemble a boiled lobster in colour, and are evidently swollen. Upon pressure the redness vanishes, but soon returns again. The skin is smooth to the touch, nor is there the least appearance of pimples or pustules. The eyes and nostrils partake more or less of the general redness; and in proportion to the intensity of this colour in the eyes, the tendency to delirium prevails.

Things continue in nearly this state for two or three days longer, when the intense scarlet gradually abates, a brown colour succeeds, and the skin becoming rough, peels off in small scales. The tumefaction subsides at the same time, and the patients gradually recover their strength and appetite.

During the whole course of the disease, the pulse is quick, small, and uncommonly feeble; the urine small in quantity; the sub-maxillary glands somewhat enlarged and painful to the touch. The *velum pendulum palati*, the uvula, the tonsils, and gullet, as far

as the eye can reach, partake of the general redness and tumefaction; but although collections of thick mucus, greatly resembling the specks or sloughs in the putrid fever throat, sometimes occur, yet those are easily washed off, and real ulcerations of those parts were never observed.

These are the most usual appearances of this disorder; but it too frequently assumes a much more fatal form. In some children the delirium commences in a few hours after the first attack; the skin is intensely hot; the scarlet colour appears on the first or second day, and they die very early on the third. Others again, who survive this rapid termination, instead of recovering, as is usual, about the time the skin begins to get its natural colour, fall into a kind of lingering, and die at last in the course of six or eight weeks.

In adults, circular livid spots, were frequently observed about the breast, knees, and elbows; also large blotches of red, and others of white intermixed, and often charging places.

In the month of October, when the air becomes colder, the scarlet colour of the skin was both less frequent and less permanent. Many patients had no appearance of it at all; whilst others, especially adults, had a few minute red pimples, crowned with white pellucid heads. The inside of the throat was considerably tumefied; its colour a dull red, sometimes tending to a livid. The pulse beat in general 130 or 140 strokes in a minute; was small, but hard, and sometimes sufficiently so to justify the opening of a vein; and the blood thus taken away, in every instance when cool, appeared fizy, and the whole crassamentum firm.

Happy would it be, our author observes, if the baneful influence of this disorder terminated with the febrile symptoms. But in ten or fifteen days from the cessation of the fever, and when a complete recovery might be expected, another train of symptoms occur, which at last frequently terminate fatally. The patients, after a few days amendment, feel a something that prevents their farther approach to health; an unaccountable languor and debility prevails, a stiffness in the limbs, an accelerated pulse, disturbed sleep, disinclination to food, and a scarcity of urine. These symptoms, we are told, are soon succeeded by swellings of a real dropical nature, forming sometimes an anasarca, and on other occasions an ascites.

Dr Withering, after examining the accounts given of this disease by different authors, proceeds to the diagnosis. It may be distinguished, he observes, from the petechial fever, by the eruption in the latter appearing seldom before the fourth day, by the regularity and distinctness of the spots, and by its principally occupying the neck, the back, and the loins. On the other hand, in the scarlet fever, the eruption generally appears about the third day; consists either of broad blotches, or else one continued redness, which spreads over the face and the whole body.

In the fever called *purpura*, the pustules are prominent, their colour under pressure, and never appear early in the disease; whereas in the scarlet fever, the eruption appears more early, is not prominent, but perfectly smooth to the touch, and becomes quite white under pressure.

Although

Although the *purple fever* and *scarlatina* may be connected by some general cause, yet our author takes occasion to observe, that they cannot be mere modifications of the same eruption: for examples occur, he says, of the same person being first seized with one of these disorders, and afterwards with the other; but he never met with an instance of the same person having the scarlet fever twice; and he believes it to be as great an improbability as a repetition of the small-pox.

This disorder is particularly distinguished from the *measles*, we are told, by the want of that cough, watery eye, and running at the nose, which are known to be the predominant symptoms in the early state of the measles, but are never known to exist in the scarlatina.

From the *erysipelas* this disease is distinguishable, by the limited less of the former, together with its not being contagious.

The *ulcerated sore throat*, however, is more difficult to distinguish from this disease than any other; and yet the distinction is a matter of the greatest importance, as the method of treatment, we are told, ought to be extremely different.—But although, in a number of circumstances, these two diseases bear a very great resemblance, yet, with a little attention, the one may in general be distinguished from the other. From Dr Fothergill's account of the sore throat attended with ulcers, our author has made out the following characteristic circumstances of the two diseases, contrasted to one another.

|   |   |
|---|---|
| Scarlatina Anginosa.  | Angina Gangrenosa.  |
| Season. Summer . . Autumn.  | Season. Spring . . Winter.  |
| Air. Hot . . Dry.   | Air. Warm . . Moist.  |
| Places. High . . Dry . . . . Gravelly.  | Places. Close . . Low . . Damp . . Marshy.  |
| Subjects. Vigorous. Both sexes alike. . Robust in most danger . . . .   | Subjects. Delicate . . Women and female Children. Robust adults not in danger.                                |
| Skin. Full scarlet . . . . Smooth . . If pimply, the pimples white at the top . . Always dry and hot.                             | Skin. Red tinge . . pimply. . The pimples redder than the interstices . . bedewed with sweat towards morning. |
| Eyes. Shining, equable, intense redness, rarely watery.   | Eyes. Inflamed and watery, or sunk and dead.  |
| Throat. In summer, tonsils, &c. little tumefied; no slough . . In autumn, more swelled. Integuments separating . . Sloughs white. | Throat. Tonsils, &c. considerably swelled and ulcerated . . Sloughs dark brown.                               |
| Breath. Very hot, but not fetid.  | Breath. Offensive to the patients and assistants.   |
| Voice. In summer, natural.  | Voice. Flat and Rattling.   |
| Bowels. Regular at the accession.   | Bowels. . Purgings at the accession.  |
| Blood. Buffy . . Firm.  | Blood. Florid . . Tender.   |
| Termination. The 3d, 5th, 8th, or 11th day.   | Termination. No stated period.  |
| Nature. Inflammatory.   | Nature. Putrid.   |
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It is not pretended, out author remarks, that all the above contracted symptoms will be met with in every case. It is enough, he observes, that some of them appear; and that if conjoined, with the consideration of the prevailing constitution, they enable us to direct that mode of treatment which will most contribute to the relief of the sick.

*Cause.* Our author affirms that the immediate cause of this disease is a poison of a peculiar kind, communicable by contagion.

2. That this poison first takes possession of the mucous membrane lining the fauces and the nose; and either by its action upon the secretory glands, or upon the mucus itself, assimilates that mucus to its own nature.

3. That it is from this beginning, and from this only, that it spreads to the stomach, &c. and at length acts upon the system at large.

4. That its first action upon the nerves, is of a sedative or debilitating nature.

5. That in consequence of certain laws of the nervous system, when the debilitating effects operate upon the sensorium commune, a reaction takes place; and that this reaction is, *ceteris paribus*, proportioned to the debilitating power.

6. That, in consequence of this re-action of the nervous system, the vibratory motion of the capillary blood-vessels dependent thereon is greatly increased; an unusually large quantity of blood is accumulated in those vessels; the heart and large blood-vessels are deprived of their customary proportion; and hence, though stimulated to more frequent contraction, the pulse must necessarily be feeble.

7. That as violent exertions are followed by debility, upon the cessation of the fever, the capillary vessels, which had acted with such unusual violence, are left in a state of extreme debility, and are long in recovering their tone; hence it is that so many patients afterwards become dropical.

Our author now proceeds to the consideration of the different remedies, which either are at present in common use, or have been recommended as proper in this disease.

*Cure.* Blood-letting has been recommended by authors; but such was the state of the pulse in this disorder, at least during the summer-months, that it was not in any instance thought advisable to take away blood. In some cases, indeed, where the fiery redness of the eyes seemed to demand the use of leeches, they were had recourse to, but never with any advantage. In the harvest months, when the pulse was more firm, and when suffocation seemed to be threatened from the swelling in the fauces, blood-letting was sometimes advised, but still with less advantage than one would have expected in almost any other situation.

Vomiting.] This, our author observes, seems to be the remedy of nature; and he is surprised how it should have been omitted by several authors, who have gone before him. Vomiting, he says, most amply fulfils the indications arising both from a consideration of the cause and of the effects; and a liberal use of the remedy he holds forth as the true foundation for successful practice in scarlet-fever and sore-throat. His common form of emetic is a combination of tartar

emetic and ipecacuanha, given in pretty smart doses; and these are to be repeated at least once in 48 hours, and in the worst cases so often as twice in 24 hours.

**Purgings.]** The action of purgatives is considered by our author as altogether repugnant to the curative indications in this disease: for the poison, as formerly remarked, being received into the system by the fauces, the operation of a purge, instead of discharging it, can only promote its diffusion along the alimentary canal; and in fact, we are told, that when even a spontaneous purging supervenes in this disease, the patients sink so amazingly fast, that it is not within the reach of art to support them.

**Sudorifics. Cordials. Alexipharmics.]** None of these remedies were found beneficial. With respect to cordials, our author observes, that although they seem to be indicated by the great loss of strength and feeble pulse, yet the certain consequence of their use always was, an increase of restlessness, of the delirium, and of the heat.

**Diuretics.]** These were found very beneficial. The vegetable fixed alkali is recommended as the most proper article of this kind: a dram or two may be easily swallowed every 24 hours, by giving a small quantity in every thing the patient drinks.

**Peruvian bark.]** No medicine, we are told, ever had a fairer trial in any disease than the Peruvian bark had in this epidemic; for the feeble pulse, great prostration of strength, with here and there a livid spot, were thought to be such undeniable evidences of a putrid tendency, that the bark was poured down not with a sparing hand. But this was only at first; for these livid spots and the sloughs in the throat being found to be the effects of inflammation instead of putrefaction, and the bark instead of diminishing, rather increasing these symptoms, it was at last entirely laid aside.

Upon the same principles that the bark was prescribed, fixable air was at first likewise advised, but with no evident effects either one way or another. Dulcified acids were also had recourse to, but with no advantage.

**Opiates.]** These, although recommended by some authors for the removal of inquietude and watchfulness, yet in this epidemic, instead of effecting these purposes, always increased the distress of the patient.

**Blisters.]** In the summer appearance of the disease, blisters were universally detrimental; they never failed to hasten the delirium; and if the case was of the worst kind, they too often confirmed its fatal tendency. In the autumnal season, when the inflammation was less generally diffused through the body, they were less detrimental, but did not even here produce any beneficial effects.

Injected gargles of contrayerva decoction, sweetened with oxymel of squills, &c. were found very beneficial in bringing always large quantities of viscid ropy stuff from the fauces.

The immersion of the feet and legs in warm water, although it did no harm, yet it did not either procure sleep or abate the delirium, as it frequently does in other kinds of fever.

As in summer it was found difficult to keep the patients sufficiently cool, they were ordered to lie

upon a mattress instead of a feather-bed; a free circulation of air was kept up; and where the patient's strength would admit of it, they were ordered frequently out of doors. Animal food and fermented liquors were denied them, and nothing allowed but tea, coffee, chocolate, milk and water, gruel, barley-water, and such articles.

With respect to the dropical disorder which so frequently succeeds to this complaint, it was never observed, our author remarks, when the preceding symptoms had been properly treated.

When called upon to patients in the dropical state, our author commences his practice by a dose of calomel at night, and a purgative in the morning. When a febrile pulse attended the other symptoms, emetics were useful, as well as the saline draughts and other neutral salts. When great debility, comatose or peripneumonic symptoms occurred, blisters were found very serviceable: but when dropical symptoms were the principal cause of complaint, small doses of rhubarb and calomel are advised; recourse was also had to diluted solutions of fixed alkalies, squills, Seltzer waters, and other diuretics.

When the urine flows freely, steel and other tonics are recommended; together with gentle exercise, high-seasoned foods, wine, and the wearing of flannel in contact with the skin.

Our author concludes his essay with an enumeration of several cases, treated according to the principles above laid down. The successful termination of these cases demonstrates the propriety of the practice which he has recommended.

# LXXVIII. URTICARIA, the NETTLE-RASH.<sup>o</sup> GENUS XXXIII.

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Febris urticata, *Vog.* 40.

Uredo, *Lin.* 8.

Purpura urticata, *Junc.* 75.

Scarlatina urticata, *Sauv.* sp. 2.

Erythipelatis species altera, *Sydenham*, sect. vi. cap. 6.

Febris scarlatina, et febris urticata, *Messerey*, Mal. des armées, 291 et seq.

**Description.** This disease has its English name from the resemblance of its eruption to that made by the stinging of nettles. These little elevations upon the skin in the nettle-rash often appear instantaneously, especially if the skin be rubbed or scratched, and seldom stay many hours in the same place, and sometimes not many minutes. No part of the body is exempt from them; and where many of them rise together, and continue an hour or two, the parts are often considerably swelled; which particularly happens in the face, arms, and hands. These eruptions will continue to infect the skin, sometimes in one place and sometimes in another, for one or two hours at a time, two or three times every day, or perhaps for the greatest part of the 24 hours.—In some persons they last only a few days, in others many months; nay, sometimes the disease hath lasted for two years, with very short intervals, or even for seven or ten years.

But though the eruption of the urticaria resembles, as already observed, that produced by the stinging of nettles, it is sometimes accompanied with long wheals,



PRACTICE as if the part had been struck with a whip. Whatever be the shape of these eminences, they always appear solid, without having any cavity or head containing either water or any other liquor: and this affords an easy mark whereby this disease may be distinguished from the itch. For it often happens, that the insufferable itching with which this eruption is attended, provokes the patient to scratch the parts so violently, that a small part of the cuticle on the top of these little tumours is rubbed off; a little scab succeeds; and, when the swelling is gone down, there is left an appearance hardly to be distinguished from the itch, but by the circumstance just now mentioned. The nettle-rash also further differs from the itch, in not being infectious.

*Causes, &c.* Dr Heberden inclines to ascribe this distemper to some mechanical cause outwardly applied to the skin. He observes, that most people suffer in a similar manner from the real stinging of nettles. Cowhage, or, as it is corruptly called, *cow-itch*, is a sort of phaeolus, or French bean, the pod of which is covered over with a kind of down or hair, and the effect of it upon the skin is much the same as that of nettles; and almost any hairs cut equally short, and sprinkled upon the skin, whenever they happen to stick in it, will make the part itch or smart in such a manner as to give great uneasiness; it is also a considerable time before the skin can be cleared of the finer ones, when once they are strewn upon it.

Reaumur, in the fourth memoir of his History of Insects, describes a species of caterpillars to which belongs a sort of hairs almost invisible to the naked eye, which are easily detached, and frequently float in the air round their nest, though it have not been at all disturbed. The touch of these hairs has a similar effect with the cow-itch; that is, they occasion intolerable itchings, with little bumps and redness, arising sometimes to a slight inflammation. These he found would continue four or five days, if the animal or the nest had been much handled; and though they had not been touched at all, yet, by only walking near their nests, the same effects would be brought on, but for a shorter time. These hairs affect the skin in this manner by sticking in it, as he could perceive with a glass of a great magnifying power; for with one of a small power they were not visible. The uneasy sensations caused by these small wounds, not only, as he says, last several days, but move from one part of the body to the other; so that they will cease upon one wrist, and immediately begin on the other; from the wrist they will go to the fingers or the face, or even to the parts of the body which are covered. He supposes, that the motions of the body, when much of this fine down lies near or upon the skin, may drive it from one part to another, or change what was lying there inoffensively to a situation fit to make it penetrate into the skin. Neither cold water, nor oil, nor spirit-of-wine, with which the parts affected were bathed, had any effect in removing the itching. He thinks the most efficacious remedy which he tried for this complaint was, to rub the parts strongly with parsley, which instantly lessened the sensations, and, after two or three hours, entirely freed him from them. It is also well known, that many species of caterpillars, by only walking over the hands, will

PRACTICE produce something like this effect on the parts which they touch, and undoubtedly from the same cause.

Dr Heberden asks, Is it impossible that the nettle-rash should arise from the same causes, or from others similar, which we mist by looking too deeply for them in the blood and humours? Such, says he, may have been its origin in some instances, where it has lasted only a few days; but where this affection hath continued for some years, in persons who change their linen every day, and who bathe frequently all the time, it can hardly be ascribed to such an external cause. Our author has observed it frequently to arise from cantharides: but though it hath continued many weeks after the removal of the blister, yet it might be suspected that this arose from the fine spicula of the cantharides sticking all this time about the skin; it being customary to strew much of the dry powder of the cantharides over the blister-plaster, whence it may readily be carried to other parts of the body. But it is certain that similar effects will sometimes follow the internal use of wild valerian root, or the eating of fish not sufficiently dressed; muscles, shrimps, and even honey, and the kernels of fruits, will also sometimes produce symptoms of a similar kind. But whatever be its cause, Dr Heberden never saw any reason to suppose that the nettle-rash had in any way vitiated the humours to such a degree as to require the use of internal remedies; and if the itching could be certainly and expeditiously allayed, there would be no occasion for any farther cure. The Doctor concludes this history of the disorder with a case communicated to him by Dr Monsey, physician of Chelsea-college, and in which the disease appeared with uncommon violence.

W. A. aged near 30, of a thin spare habit, was seized with a disorder attended with symptoms of a very uncommon kind. Whenever he went into the air, if the sun shined bright, he was seized with a tickling of his flesh on those parts exposed to the sun: this tickling, by his continuing in the air, increased to a violent itching, attended with great heat and pain: the skin would then be almost as red as vermilion, and thicken like leather; and this remained till he went out of the open air, and then abated in about 15 or 20 minutes. This happened only when the sun was above the horizon; at other times he was what he called *quite well*.—But it was not owing to the heat of the sun; for the sun in winter affected him full as much, if not more, and the heat of the fire had no such effect. Thus he was confined to the house for ten years. He tried several hospitals, and had advices from many physicians, without the least abatement of his complaints. At last it was agreed by a consultation of physicians, that he should try dipping in salt-water; which he did at Yarmouth for 13 weeks, without any visible amendment. One hot day, having pulled off his clothes and gone into the sea in the middle of the day, the heat diffused itself so violently all over his body, that, by the time he had put on his clothes, his eye-sight began to fail, and he was compelled to lie down upon the ground to save himself from falling. The moment he lay down, the faintness went off: upon this he got up again; but had no sooner arisen, than he found himself in the former condition: he

therefore lay down again, and immediately recovered. He continued alternately getting up and lying down, till the disorder began to be exhausted, which was in about half an hour; and he was frequently obliged to have recourse to the same expedient.

Having at last accidentally met with Dr Monsey, this physician questioned him concerning the cause of the disorder; but nothing could be guessed at, excepting that the patient owned he had one winter lived entirely upon bullock's-liver and porter, from inability to purchase better victuals. A comrade lived with him at that time, on the same provisions; and he also was affected in a similar manner, though in a less degree, and had recovered. This patient was then first put upon a course of Dover's sweating powder without any effect, and afterwards tried a course of nitrous ones with the same bad success. At last Dr Monsey determined to try the effect of mercurium, which happily proved effectual in removing this obstinate and uncommon distemper. The patient began with taking five grains of calomel for three nights running, and a cathartic next morning. In this course he went on for near a fortnight, at the end of which he found himself very sensibly relieved. This encouraged him to go on rather too boldly, by which means a slight salivation ensued; however, that went off soon, and in about six weeks he was quite well.—Some time after, he was threatened with a return of his disorder; but this was effectually relieved by a dose of calomel, which he had afterwards occasion to repeat for the same reason, and with the same success; but at last the disorder seemed to be radically cured, by his having no further symptoms of a relapse.

complained of sickness at stomach, great oppression about the præcordia, head-ach, lassitude, and weariness, on the least exertion; with stiffness and rigidity of his knees and other joints. The surgeon of the regiment visited him: he was purged, but with little benefit. About ten days before, he observed on the inside of his thighs a number of very small, distinct, red spots, a little elevated above the surface of the skin, and much resembling the first appearance of small-pox. This eruption gradually spread itself over his whole body, and the pulsules continued every day to increase in size.

Upon being received into the hospital, he complained of head-ach, sickness at stomach, oppression about the præcordia, thirst, sore throat, with difficulty of swallowing; his tongue was foul, his skin felt hot and feverish; pulse from 110 to 120, rather depressed; belly costive; eyes dull and languid, but without delirium. The whole surface of his skin was interperfed with vesicles, or phlyæænæ, of the size of an ordinary walnut; many of them were larger, especially on the arms and breast. In the interstices, between the vesicles, the appearance of the skin was natural, nor was there any redness round their base; the distance from one to another was from half an inch to a hand-breadth or more. In some places two or three were joined together, like the pustules in the confluent small-pox. A few vesicles had burst of themselves, and formed a whitish scab or crust. These were mostly on the neck and face; others shewed a tolerably laudable pus. However, by far the greatest number were perfectly entire, turgid, and of a bluish colour. Upon opening them it was evident, that the cuticle elevated above the cutis, and distended with a thin, yellowish, semipellucid serum, formed this appearance. Nor was the surface of the cutis ulcerated, or livid; but of a red florid colour, as when the cuticle is separated by a blister, or superficial burning. No other person laboured under a similar disease, either in the part of the country from which he came, or when he resided in Aberdeen.

This case was treated in the following manner. The largest of the vesicles were fissiped, and dressed with unguent. e lap. calaminari. In the evening he was vomited with a solution of tartar emetic, given in small quantities and at intervals. This also procured two loose stools. And he was ordered for drink, water-guel acidulated with lemon-juice.

“ April 16. He still complained of sickness, some oppression about his breast, and sore throat; he had slept little during the night; his tongue was foul and blackish; his skin, however, was not so hot as the preceding day; his urine was high-coloured, but had the appearance of separation; his pulse 90, and soft; most of the sores on the trunk of the body looked clean. Others, particularly where the vesicles were confluent, seemed beginning to ulcerate, and to have a bluish sub-livid appearance. They were dressed afresh with cerate, and he was ordered the following medicines:

℞ Deco<sup>t</sup>. Cort. Peruvian. ʒvi. Vini rubr. Lusitan. ʒiii. M. Hujus mixturæ capiat ʒss. tertia quaque hora.

“ His acidulated drink was continued; and on account of the very offensive smell on approaching near him, some vinegar was placed in a basin before the bed, and sprinkled on the floor; and the room was kept

# 341 LXXIX. PEMPHIGUS. Gen. XXXIV.

Pemphigus, *Sauv.* gen. 93. *Sag.* 291.  
*Morta, Lin.* 1.

Febris bullosa, *Vog.* 41.

Pemphigus major, *Sauv.* sp. 1.

Exanthemata serosa, *C. Pison.* Obs. 150.

Febris pemphygedes, *Ephem. Germ.* D. I. A. viii.  
Obs. 56.

Pemphigus castrensis, *Sauv.* sp. 2.

Febris fyncheas, cum vesiculis per pectus et collum  
sparsis, *Morton App.* ad Exerc. II.

Pemphigus Helveticus, *Sauv.* sp. 3. *Langhans* in  
*Act. Helvet.* vol. ii. p. 260. et in *Beischreibung*  
*des Siementhals*, Zurich 1753.

THIS is a very rare disease, inasmuch that Dr Cullen declares he never saw it. He declines taking the descriptions of foreign physicians; we shall therefore content ourselves with giving an instance of this very uncommon distemper, as it was observed in the infirmary at Aberdeen.—A private soldier of the 73d regiment, aged eighteen years, formerly a pedlar, and naturally of a healthy constitution, was received into the hospital at Aberdeen on the 25th of April. About twenty days before that, he had been seized with the measles when in the country; and, in marching to town, on the second day of their eruption, he was exposed to cold; upon which they suddenly disappeared.

Having arrived at Aberdeen, he was quartered in a damp, ill-aired, under-ground apartment. He then

PRACTICE kept properly aired.

"April 17. His sores looked tolerably clean, unless on his arms and thighs; where they were livid, a little ulcerated, and discharged a bloody ichor.

"His head-ach, sickness, &c. were mostly gone; his tongue was rather cleaner; pulse 68, and soft. As the decoction of the bark sat easily on his stomach, the following prescription was ordered:

℞ Pulv. subtiliss. Cort. Peruv. ʒʒ. Vini rubri Lufitan. Aquæ fontan. añ ʒʒ. M. ft. Hauſt. tertia quaque hora repetend.

The acidulated drink was continued, and fresh dressings applied to the sores.

"April 18. The little ulcers in his arms and thighs still discharged a bloody ichor, and looked ill; his other complaints were better; pulse 82. The bark had not nauseated him, and it was continued as well as his former drink.

"April 19. His sores looked greatly cleaner and better; the fever was gone, his pulse natural, and he had no complaint but weakness and a troublesome itching of the skin: The Peruvian bark, &c. were continued.

"April 20. Some of the ulcers still poured forth a bloody ichor; most of them, however, looked well, and had begun to heal—fever gone—medicines continued.

"From the 21st April, he went on gaining strength, and his sores appeared to heal fast; he was desired to take only four doses every day; and by the 27th his sores, &c. were totally dried up—he had no complaint—was dismissed cured."

#### 342 LXXX. APHTHA, the THRUSH. Genus XXXV.

Aphtha, Sauv. gen. 100. Lin. 9. Sag. 298. Boerb. 978. Hoffm. II. 478. Janck. 137. Febris aphthosa, Vog. 44.

The only idiopathic species is the thrush to which infants are subject; (Aphtha lactucina, Sauv. sp. 1.)

The aphthæ are whitish or ash-coloured pustules, invading the uvula, fauces, palate, tonsils, inside of the cheeks, gums, tongue, and lips. They for the most part begin at the uvula, sending forth a glutinous mucus, and the pustules covering all or the greatest number of the parts above-mentioned with a thick whitish crust adhering most tenaciously. This crust doth not induce an elchar on the parts on which it lies by eating into them, but comes off in whole pieces after the pustules have arrived at maturity. This will often happen in a short time, so that the throat and internal parts of the mouth are frequently observed to be clean which a few hours before were wholly covered with white crusts. Neither is this disease confined to the throat and fauces, but is said to affect the œsophagus, stomach, and all parts of the alimentary canal. Of this indeed there is no other proof, than that, after a great difficulty of swallowing, there is sometimes an immense quantity of aphthæ evacuated by stool and vomit, such as the mouth could not be thought capable of containing.

*Cause*, &c. The aphthous fever seems to be produced by cold and moisture, as it is found only in the northern countries, and especially in marshy places; and in them the aphthæ often appear without any fever at all.

*Prognosis*. There is no symptom by which the coming out of aphthæ can be foretold, tho' they are common in many fevers; but they themselves are in general a bad symptom, and always signify a very tedious disorder: the danger denoted by them is in proportion to the difficulty of deglutition; and a diarrhoea accompanying them is likewise bad. This indeed generally carries off old people when they become affected with aphthæ. The dark-coloured aphthæ also are much more dangerous than such as are of a brown or other dark colour; but it is a good sign when the appetite returns, and the dark-coloured ones are succeeded by others of a whiter colour. Neither are those which are unaccompanied with fever so dangerous as the other kind.

*Cure*. As the aphthæ are seldom a primary disease, we must generally endeavour to remove the disorder upon which they depend, after which they will fall off; but in the mean time we are not to neglect applications to the aphthæ themselves, such as detergent and softening gargles made of the decoction of figs, with the addition of honey of roses, a little vinegar, and some tincture of myrrh: in those ulcerated aphthæ which appear in the malignant fore throat, Mr Penrose recommends the *vitrum antimonii ceratum*.

#### ORDER IV. HÆMORRHAGIÆ; HÆMORRHAGES. 443

Hæmorrhagiæ, Vog. Class II. Ord. I. Hoffm. II. 194. Janck. 5. Sanguifluxus, Sauv. Class IX. Ord. I. Sag. Class V. Ord I.

#### LXXXI. EPISTAXIS, or BLEEDING at the NOSE. 344 Genus XXXVIII.

Hæmorrhagia, Sauv. gen. 239. Lin. 173. Sag. gen. 174. Hæmorrhagia narium, Hoffm. II. 196. Janck. 6. Hæmorrhagia plethorica, Sauv. sp. 2. Hoffm. II. 198.

The other species enumerated by authors are all symptomatic.

*Description*. The milder species of this hæmorrhage comes on more frequently in summer than in winter, and for the most part without giving any warning, or being attended with the least inconvenience; but the less benign kind is preceded by several remarkable symptoms. These are, congestions of the blood sometimes in one part and sometimes in another, and which are often very troublesome in the sides of the head; there is a redness of the cheeks; an inflation of the face, and the vessels of the neck and temples; a *tinnitus aurium*; a heavy pain of the eyes, with a prominence, dryness, and sparks; there is a vertiginous affection of the head, with an itching of the nostrils, and a sense of weight, especially about the root of the nose. In some the sleep is disturbed with dreams about blood, fire, &c. Frequently the belly is colic, there is a diminution of the quantity of urine, a suppression of sweat, coldness of the lower extremities, and tensions of the hypochondria, especially the right one.

*Cause*, &c. This hæmorrhage may occur at any time of life; but most commonly happens to young persons, owing to the peculiar state of the system

at



at that time. Sometimes, however, it happens after the *æxæ* and during the state of manhood, at which time it is to be imputed to a plethoric state of the system; to a determination of the blood, by habit, to the vessels of the nose; or to the particular weakness of these vessels.

In all these cases the disease may be considered as an arterial hæmorrhage, and depending upon an arterial plethora; but it sometimes occurs in the decline of life, and may then be considered as the sign of a venous plethora in the vessels of the head. It often happens at any period of life in certain febrile diseases, which are altogether or partly of an inflammatory nature, and which shew a particular determination of the blood to the vessels of the head. As by this evacuation the diseases are often removed, it may on these occasions be deemed truly *critical*. It happens to persons of every constitution and temperament; but most frequently to the plethoric and sanguine, and more commonly to men than women.

*Prognosis.* In young people, the bleeding at the nose may be considered as a slight disease, and scarce worth notice. But, even in young persons, when it recurs very frequently and in great quantity, it is alarming; and is to be considered as a mark of an arterial plethora, which in the decline of life may give the blood a determination to parts from which the hæmorrhage would be more dangerous. And this will require more particular attention as the marks of plethora and congestion preceding the hæmorrhage are more considerable, and as the flowing of the blood is attended with a more considerable degree of febrile disorder. These consequences are more especially to be dreaded, when the epistaxis happens to persons after their *æxæ*, returning frequently and violently. Even in the decline of life, however, it may be considered as in itself very salutary; but at the same time it is a mark of a dangerous state of the system, i. e. of a strong tendency to a venous plethora in the head, and hath accordingly been often followed by apoplexy, palsy, &c. When it happens in febrile diseases, and is in pretty large quantity, it may be generally considered as critical and salutary; but it is very apt to be too profuse, and thus become dangerous. It sometimes occurs during the eruptive fever of some exanthemata, and is in such cases sometimes salutary; but if these exanthemata be accompanied with any putrid tendency, this hæmorrhage, as well as artificial blood-lettings, may have very bad tendency.

*Cure.* Though this disease has been generally thought very slight, Dr Cullen is of opinion that it should seldom be left to the conduct of nature; and that in all cases it should be moderated by keeping the patient in cool air, by giving cold drink, by keeping the body and head erect, by avoiding any blowing of the nose, speaking, or other irritation; and if the blood has flowed for some time without shewing any tendency to stop, we are to attempt the suppression of the hæmorrhage by pressing the nostril from which the blood flows, washing the face with cold water, or applying this to some other parts of the body. These measures he judges to be proper even on the first attacks, and in young persons where the disease is the least hazardous; but these measures will still be more requisite if the disease frequently recurs without any

external violence; if the returns happen to persons disposed to a plethoric habit; and more particularly if the signs of plethora appear in the foregoing symptoms.

When the bleeding is so profuse that the pulse becomes weak and the face pale, every means must be used to put a stop to it, and that whether the patient is young or old. Besides those methods abovementioned, we must use astringents both internal and external; but the latter are the most powerful, and the choice of these may be left to the surgeon. The internal astringents are either vegetable or fossil; but the vegetable astringents are seldom powerful in the cure of any hæmorrhages except those of the alimentary canal. The fossil astringents are more powerful, but differ considerably in strength from one another. The chalybeates appear to have little strength: the preparations of lead are more powerful; but cannot be employed, on account of their pernicious qualities, unless in cases of the utmost danger. The *tinctura saturnina*, or *antiphthifica*, is a medicine of very little efficacy, either from the small quantity of lead it contains, or from the particular state in which it is. The safest and at the same time the most powerful astringent seems to be alum.

For suppressing this and other hæmorrhages, many superstitious remedies and charms have been used, and said to have been employed with success. This has probably been owing to the mistake of the bystanders, who have supposed that the spontaneous cessation of the hæmorrhage was owing to their remedy. At the same time Dr Cullen is of opinion, that such remedies have sometimes been useful, by impressing the mind with horror or dread. Opiates have sometimes proved successful in removing hæmorrhages; and when the fulness and inflammatory diathesis of the system have been previously taken off by bleeding, they may, in Dr Cullen's opinion, be used with safety and advantage. Ligatures have been applied upon the limbs, for retarding the return of the venous blood from the extremities; but their use seems to be ambiguous. In the case of profuse hæmorrhages, no care is to be taken to prevent the patient from fainting, as this is often the most certain means of stopping them.

#### GENUS XXXVIII. HÆMOPTYSIS, or SPITTING of BLOOD

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Hæmoptysis, *Sauv.* gen. 240. *Lin.* 179. *Vog.* 84.

*Sag.* gen. 175. *Juncb.* 8.

Hæmoptoe, *Boerb.* 1198.

Sanguinis fluxus ex pulmonibus, *Hoffm.* II. 202.

LXXXII. HÆMOPTYSIS from Plethora. Sp. I.

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LXXXIII. HÆMOPTYSIS, from External Violence.  
Sp. II.

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Hæmoptysis accidentalis, *Sauv.* sp. 1.

Hæmoptysis habitualis, *Sauv.* sp. 2.

Hæmoptysis traumatica, *Sauv.* sp. 12.

LXXXIV. HÆMOPTYSIS with Pthysis. Sp. III.

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Hæmoptysis pthistica, *Sauv.* sp. 9.

Hæmoptysis ex tuberculo pulmonum, *Sauv.* sp. 10.

LXXXV.

LXXXV. The *Calculus Hæmoptysis*. Sp. IV.  
Hæmoptysis calculosa, Sauv. sp. 14.

LXXXVI. The *Vicarious Hæmoptysis*. Sp. V.  
Hæmoptysis catacmenialis, Sauv. sp. 4.  
Hæmoptysis periodica, Sauv. sp. 5.

*Description.* The hæmoptysis commonly begins with a sense of weight and anxiety in the chest, some uneasiness in breathing, pain of the breast or other parts of the thorax, and some sense of heat under the sternum; and very often it is preceded by a saltish taste in the mouth. Immediately before the appearance of blood, a degree of irritation is felt at the top of the larynx. The person attempts to relieve this by hawking, which brings up a little florid and somewhat frothy blood. The irritation returns; and in the same manner blood of a similar kind is brought up, with some noise in the wind-pipe, as of air passing through a fluid. Sometimes, however, at the very first, the blood comes up with coughing, or at least somewhat of coughing accompanies the hawking above-mentioned.

The blood is sometimes at first in very small quantity, and soon disappears; but in other cases, especially when it frequently recurs, it is in greater quantity, and often continues to appear at times for several days together. It is sometimes profuse, but rarely in such quantity as either by its excess or by a sudden suffocation to prove immediately mortal.

It is not always easy to discover whether the blood evacuated by the mouth proceeds from the internal surface of the mouth itself, from the fauces or adjoining cavities of the nose, from the stomach, or from the lungs. It is, however, very necessary to distinguish the different cases, and for this Dr Cullen offers the following considerations.

1. When the blood proceeds from some part of the internal surface of the mouth, it comes out without any hawking or coughing; and generally, upon inspection, the cause is evident.

2. When blood proceeds from the fauces, or adjoining cavities of the nose, it may be brought out by hawking, and sometimes by coughing. In this case there may be a doubt concerning its real source, and the patient may be allowed to please himself with the thoughts that the blood doth not come from the lungs. But the physician must remember that the lungs are much more frequently the source of an hæmoptysis than the fauces. The latter seldom happens but to persons who have before been liable to an hæmorrhage from the nose, or to some evident cause of erosion; and in most cases, by looking into the fauces, the distillation of the blood from thence will be perceived.

3. When blood proceeds from the lungs, the manner in which it is brought up will commonly shew from whence it comes; but independent of that, it may also be known from the causes of hæmoptysis from the lungs, to be afterwards mentioned, having preceded.

4. When vomiting accompanies the throwing out of blood from the mouth, we may generally know the source from whence it proceeds, by considering that blood does not proceed so frequently from the stomach as from the lungs; that blood proceeding from the stomach commonly appears in greater quantity than

from the lungs. The pulmonary blood also is usually of a florid colour, and mixed with a little frothy mucus only; but the blood from the stomach is of a darker colour, more grumous, and mixed with the other contents of the stomach. The coughing or vomiting, as the one or the other happens first to arise, may sometimes point out the source of the blood; and this hath also its peculiar antecedent signs and causes.

*Causes, &c.* An hæmoptysis may be produced at any time of life by external violence; and, in adult persons, while the arterial plethora prevails in the system, i. e. from the age of 16 to 35, an hæmoptysis may at any time be produced merely by a plethoric state of the lungs. More frequently, however, it arises from a faulty proportion between the capacity of the lungs and that of the rest of the body. Thus it is often an hereditary disease, which implies a peculiar and faulty conformation.

This disease especially happens to persons who discover the smaller capacity of their lungs by the narrowness of their chest, and by the prominence of their shoulders; which last is a mark of their having been long liable to a difficulty of respiration. In such cases, too, the disease very frequently happens to persons of a sanguine temperament, in whom particularly the arterial plethora prevails. It happens also to persons of a slender delicate make, of which a long neck is a mark; to persons of much sensibility and irritability, and therefore of quick parts; to persons who have formerly been liable to hæmorrhages from the nose; to those who have suffered a suppression of any usual hæmorrhage, the most frequent instance of which is in females, who have suffered a suppression of their menstrual flux; and lastly, to persons who have suffered the amputation of any considerable limb.

All this constitutes the predisponent cause of hæmoptysis; and the disease may happen merely from the predisponent cause arising to a considerable height. But in those who are already predisposed, it is often brought on by the concurrence of various occasional and exciting causes. One of these, and perhaps a frequent one, is external heat; which, even when in no great degree, brings on the disease in spring, and the beginning of summer, while the heat rarifies the blood more than it relaxes the solids, which had before been contracted by the cold of winter. Another exciting cause is a sudden diminution of the weight of the atmosphere, especially when concurring with any effort in bodily exercise. The effort too, alone, may often be the exciting cause in those who are already predisposed; and more particularly any violent exercise of respiration. In the predisposed, also, the disease may be occasioned by any degree of external violence.

*Prognosis.* The hæmoptysis may sometimes be no more dangerous than a hæmorrhage from the nose; as when it happens to females in consequence of a suppression of their menses; when, without any marks of predisposition, it arises from external violence; or, from whatever cause arising, when it leaves no cough, dyspnoea, or other affection of the lungs, behind it. But, even in these cases, a danger may arise from too large a wound being made in the vessels of the lungs, from any quantity of red blood being left to stagnate in the cavity of the bronchiae, and particularly from any determination,

**PARTICE** termination of the blood being made into the vessels of the lungs, which by renewing the hæmorrhage may have these consequences.

**Cure.** On this subject Dr Cullen differs from those who prescribe chalybeates and the Peruvian bark in the cure of hæmoptysis. Both of these, he observes, contribute to increase the phlogistic diathesis then prevailing in the system, and the hæmoptysis from predispotion is always accompanied with a such a diathesis. Instead of these, therefore, he recommends blood-letting in greater or smaller quantity, and more or less frequently repeated as the symptoms shall direct. At the same time cooling purgatives are to be employed, and every part of the antiphlogistic regimen is to be strictly enjoined. In the London Medical Observations, the use of nitre is greatly recommended by Dr Dickson, to whom its efficacy was made known by Dr Letherland, physician to St Thomas's hospital. The most commodious method of exhibiting it he found was in an electuary. Four ounces of conserve of roses were made into an electuary with half an ounce of nitre; of which the bulk of a large nutmeg was directed to be given, four, six, or eight times a-day, according to the urgency of the case. The good effects of this, our author tells us, have often astonished him; and when given early in the disease, he says he can depend as much upon it for the cure of an hæmoptysis, as on the bark for the cure of an intermittent. He agrees with Dr Cullen, however, that in those cases where there is any hardness in the pulse, and which almost always happens, there is a necessity for venesection. A cool regimen, and quiet of body and mind, are certainly useful; but Dr Cullen observes, that some kinds of gestation, such as sailing, and travelling in an easy carriage on smooth roads, have often proved a remedy. When the cough is very troublesome, it is absolutely necessary to exhibit frequently a small dose of an opiate. Dr Dickson also informs us, that the nitre joined with spermaceti, or *pule. e tragacanth. comp.* has produced equally good effects with the electuary above-mentioned; in the composition of which the Doctor at first considered the conserve only as a vehicle for the nitre, though he means not to insinuate that the former is totally destitute of efficacy.

- 351 **PHTHISIS, or CONSUMPTION of the LUNGS.**  
*Phthisis, Sauv. gen. 276. Lin. 208. Vog. 319.*  
*Sag. 101. Junck. 33.*  
*Phthisis pulmonis, Boerh. 1196.*  
*Affectio phthistica, five tabes pulmonalis, Hoffm. II. 284.*

- 352 **LXXXVII. The Incipient PHTHISIS, with an expectation of Pus. Sp. I.**  
*Phthisis incipiens, Morton. Physiolog. L. II. cap. 3.*  
*Phthisis sicca, Sauv. sp. 1.*

- 353 **LXXXVIII. The Confirmed PHTHISIS with an expectoration of Pus. Sp. II.**  
*Phthisis confirmata auctorum.*  
*Phthisis humida, Sauv. sp. 2.*

SOMETIMES, notwithstanding all the care we can take, the hæmoptysis will degenerate into a phthisis pulmonalis, or consumption of the lungs; and sometimes an hæmoptysis will be the consequence of this dangerous

disorder. It hath been indeed supposed, that an ulceration of the lungs, or phthisis, was the natural and almost necessary consequence of an hæmoptysis: but, according to Dr Cullen, this is in general a mistake; for there are many instances of an hæmoptysis from external violence without being followed by any ulceration. The same thing hath often been observed where the hæmoptysis arose from an internal cause; and this not only in young persons, when the disease returned for several times, but when it has often recurred during the course of a long life; and it may easily be conceived, that a rupture of the vessels of the lungs, as well as of the vessels of the nose, may be sometimes healed. The causes of phthisis, therefore, Dr Cullen reduces to five heads. 1. An hæmoptysis. 2. A suppuration of the lungs in consequence of a pneumonia. 3. A catarrh. 4. An asthma; and, 5. Tubercles.

1. When a phthisis arises from an hæmoptysis, it is probable that it is occasioned by particular circumstances; and what these circumstances are, may not always be easily known. It is possible, that merely the degree of rupture, or frequently repeated rupture, preventing the wound from healing, may occasion an ulcer; or it is possible, that red blood effused, and not brought up entirely by coughing, may, by stagnating in the bronchiæ, become acrid, and erode the parts. But these hypotheses are not supported by any certain evidence; and from many observations we are led to think, that several other circumstances must concur in producing the disease from hæmoptysis.

2. The second cause of an ulceration of the lungs to be considered, is a suppuration formed in consequence of pneumonia. When a pneumonia, with symptoms neither very violent nor very slight, has continued for many days, it is to be feared it will end in a suppuration: but this is not to be determined by the number of days; for, not only after the fourth, but even after the tenth day, there have been examples of a pneumonia ending by a resolution; and if the disease has suffered some intermission, and again recurred, there may be instances of a resolution happening at a much later period from the beginning of the disease than that just now mentioned. But, if a moderate disease, in spite of proper remedies employed, be protracted to the 14th day without any considerable remission, a suppuration is pretty certainly to be expected; and it will be more certain still, if no signs of resolution have appeared, or if an expectoration which had appeared shall have again ceased, and the difficulty of breathing has continued or increased while the other symptoms have been rather abated.

That in a pneumonia, the effusion is made which may lay the foundation of a suppuration, we conclude from the difficulty of breathing becoming greater when the patient is in a horizontal posture, or when the patient can lie more easily on the affected side. That, in such cases, a suppuration has actually begun, we conclude from the patient's being frequently affected with slight cold shiverings, and with a sense of cold felt sometimes in one sometimes in another part of the body. We form the same conclusion also from the state of the pulse, which is commonly less frequent and softer, but sometimes quicker than before. That a suppuration is already formed, we conclude from there being a considerable



siderable remission of the pain which had before subsisted; while at the same time the cough and especially the dyspnoea continue, and are rather increased. At the same time the frequency of the pulse is rather increased, the feverish state suffers considerable exacerbations every evening, and by degrees a hectic in all its circumstances comes to be formed.

In this state of symptoms, we conclude very confidently, that an abscess, or, as it is called, a *vomica*, is formed in some part of the pleura, and most frequently in that portion of it investing the lungs. Here purulent matter frequently remains for some time, as if inclosed in a cyst; but commonly not long before it comes to be either absorbed and transferred to some other part of the body, or breaks through into the cavity of the lungs, or into that of the thorax. In the latter case it produces the disease called *empyema*; but it is when the matter is poured into the cavity of the bronchiae that it properly constitutes the phthisis pulmonalis. In the case of empyema, the chief circumstances of a phthisis are indeed also present: but we shall here consider only that case in which the abscess of the lungs gives occasion to a purulent expectoration.

An abscess of the lungs in consequence of pneumonia, is not always followed by a phthisis: for sometimes a hectic fever is not formed; the matter poured into the bronchiae is a proper and benign pus, which frequently is coughed up very readily, and spit out; and though this purulent expectoration should continue for some time, if it be without hectic, the ulcer soon heals, and every morbid symptom disappears. This has so frequently happened, that we may conclude, that neither the access of the air, nor the constant motion of the lungs, will prevent an ulcer of these parts from healing if the matter of it be well-conditioned. An abscess of the lungs, therefore, does not necessarily produce the phthisis pulmonalis; and if it is followed by such a disease, it must be in consequence of particular circumstances which corrupt the purulent matter produced, render it unsuitable to the healing of the ulcer, and at the same time make it afford an acrimony, which, absorbed, produces a hectic and its consequences.

The corruption of the matter of such abscesses may be owing to several causes; as, 1. That the matter effused during the inflammation had not been a pure serum fit to be converted into a laudable pus, but had been joined with other matters which prevented that, and gave a considerable acrimony to the whole: Or, 2. That the matter effused and converted into pus, merely by long stagnation in a vomica, or by its connection with an empyema, had been so corrupted as to become unfit for the purpose of pus in the healing of the ulcer. These seem to be possible causes of the corruption of matter in abscesses, so as to make it the occasion of a phthisis in persons otherwise sound; but it is probable that a pneumonic abscess especially produces phthisis when it happens to persons previously disposed to that disease, and therefore only as concurring with some other causes of it.

3. The third cause supposed to produce a phthisis is a catarrh; which, in many cases, seems in length of time to have the expectoration of mucus proper to it gradually changed to an expectoration of pus; and at the same time, by the addition of a hectic fever, the

disease, which was at first a pure catarrh, is changed into a phthisis. But this supposition is not easily to be admitted. The catarrh is properly an affection of the mucous glands of the trachea and bronchiae analogous to the coryza and less violent kinds of cynanche tonsillaris, which very seldom end in suppuration. And although a catarrh should be disposed to do so, the ulcer produced might readily heal up, as it does in the case of a cynanche tonsillaris; and therefore should not produce a phthisis.

Further, the catarrh, as purely the effect of cold, is generally a mild disease as well as of short duration; and, according to Dr Cullen, there are at most but very few of the numerous cases of it, which can be said to have ended in a phthisis. In all these cases in which this seems to have happened, he thinks it probable that the persons affected were peculiarly predisposed to phthisis; and the beginning of phthisis so often resembles a catarrh, that it may have been mistaken for such a disease. It often happens also to increase the fallacy, that the application of cold, which is the most frequent cause of catarrh, is also frequently the exciting cause of the cough, which proves to be the beginning of a phthisis.

Many physicians have supposed that an acrimony of the fluids eroding some of the vessels of the lungs is a frequent cause of ulceration and phthisis; but this appears to Dr Cullen to be a mere supposition. He acknowledges, that in many cases an acrimony subsisting in some part of the fluids is the cause of the disease; but observes that it is at the same time probable, that this acrimony operates by producing tubercles, rather than by any direct erosion.

A phthisis, indeed, most commonly arises from tubercles. Dr Simmons informs us, that he has had opportunities of inspecting the bodies of several people who died in this way, and never found them totally absent. He hath likewise seen them in subjects of different ages, who had been troubled with no symptoms of an affection of the breast during their lifetime. In these, however, they were small, and few in number. This proves that they may exist without inconvenience till they begin to disturb the functions of the lungs by their size and number; or till some degree of inflammation is excited, either by accidental causes, or by certain changes that take place within their substance; for as yet we know but little of their true nature. These little tumours vary in their consistence; in some they are composed of a pulpy substance, and in others approach more to the nature of scirrhus. They are most commonly formed in consequence of a certain constitutional predisposition; but whatever is capable of occasioning a morbid irritability of the lungs seems to be capable of generating them. Thus the spasmodic asthma frequently ends in tubercles and consumption; and it is not unusual for millers, stone-cutters, and others, to die consumptive, from their being so constantly exposed to dust, which in these cases probably acts by producing similar concretions: and Dr Kirkland observes, that scyther-grinders are subject to a disease of the lungs, from particles of sand mixing with iron dust, which among themselves they call the *grinders rot*. Tubercles likewise often have their source from a scrophulous acrimony; and some eminent physicians have supposed that the generality of pulmonary consumptions are of

this kind. This notion, however, they have carried too far: they have probably been misled by these tuberculous concretions which, without good reason, have been supposed to be diseased glands, and of course analogous to the glandular affections we meet with in the scrophula. Tubercles may likewise sometimes be owing to the sudden repulsion of cutaneous eruptions, or of the matter of exanthemata, &c. or to other causes.

The persons who are most liable to consumption are those of a fair complexion, fine and soft skin, florid cheeks, and a slender make; with high cheek-bones, hollow temples, long neck, shoulders standing out like wings, narrow chest, and a remarkable prominence of the processes of the os sacrum. To these marks we may add, that of *soured teeth*, which, as the disease advances, usually become of a milky white colour, and more or less transparent. Of those who are carried off by this disease, Dr Simmons asserts, the greater number will be found never to have had a carious tooth.

Persons of the above description often remain for a long time without feeling any other inconvenience than some oppression at the breast in moist weather, or in hot apartments. Their breathing is easily hurried, sometimes by the slightest motion; and they become languid, paler, and thinner. All this while, however, they feel no heat or painful sensation in the breast. As the evil increases, the patient begins to be attacked with a slight, frequent, and dry cough, which is most troublesome in the night-time. This, however, by proper care, is often relieved; and the patient remains in this state for a considerable time, and even for many years, if he is sensible of his danger, and careful to guard against it by a suitable manner of living. More commonly, however, we find the cough increasing, and sometimes accompanied with more or less of catarrh. This is usually ascribed to cold; and but too generally neglected, till the disease becomes alarming by its obstinacy and its effects. This may be considered as the *beginning*, or first period, of the disease. During this stage, the cough is sometimes dry from the first; and sometimes, when it sets in in the form of a catarrh, is attended with more or less expectoration of mucus.

When the cough sets in in the form of a catarrh, and appears to be occasioned by an increased secretion of a thin saltish mucus irritating the membrane of the trachea, all judicious practitioners agree in recommending an attention to regimen, the free use of diluting liquors, bland emulsions, small doses of nitre, the taking away a few ounces of blood if there be much inflammation, the inhaling the steams of warm water †, and the occasional use of such a dose of elixir pargoricum as will be sufficient to allay the irritation of the bronchiz, and to promote a gentle moisture on the skin. These methods will generally be found to be efficacious, especially if the patient's chamber is of a moderate temperature, and he carefully avoids exposure to a cold, damp, or raw air, till the complaint is removed. In cases in which the cough has been obstinate, and the inflammatory symptoms considerable, Dr Simmons has often experienced the great advantages of the warm bath, the heat of which did not exceed 92°. When this is had recourse to, the patient should remain in it only a very few mi-

nutes, and go soon afterwards to bed; but not with a view to force a sweat by an increased weight of bed-clothes, as is too often injudiciously practiced.

Patients of a consumptive habit, who have had an attack of this kind at the beginning of winter, are particularly liable to a return of the complaint during the continuance of the cold season, on the slightest occasion and with greater violence. A relapse is therefore to be carefully guarded against; and nothing will be found to do this more effectually than the use of socks and a flannel under-waistcoat. The use of flannel has been condemned by several medical writers as increasing the insensible perspiration; but in the present case, to say nothing of some others in which it may be useful, it will in general be found to have the best effects. It will prevent a too great determination to the lungs, and should not be left off till the approach of summer. In some few instances in which flannel was found to have a disagreeable effect, a piece of dimity, worn over the breast next the skin, prevented the return of colds and coughs in persons of a delicate habit, who had before been liable to them on the slightest occasions. In these cases, circumstances that are seemingly of the most trifling nature become of importance.

Sometimes the cough is occasioned by an immediate inflammation of some part of the lungs, from some of the usual causes of inflammation; and when this happens no time is to be lost in removing it. To do this will perhaps require more than one bleeding, together with a strict attention to a cooling plan of diet, diluting drinks, the inhalation of warm steams, and, if convenient, the use of the warm bath; but above all, the speedy application of a large blister as near as may be to the supposed seat of the inflammation. The cough, in this case, will often remain after the original complaint is abated. A prudent use of opiates at bed-time, joined to gum ammoniacum, will then generally be useful as a sedative and antispasmodic.

In this, as well as in the catarrhal cough just now mentioned, many practitioners are too eager to administer the Peruvian bark, with the view, as they term it, of *bracing up* the patient: but this never fails to increase the cough, and of course to do great and very often irreparable mischief.

And here it will not be foreign to our subject to observe, that a symptomatic cough, which has its rise not from catarrh, or from an immediate inflammation of the lungs, but from their sympathy with the stomach, has sometimes laid the foundation of phthisis, from its having been mistaken, and of course improperly treated. It seems to be owing to a redundancy or vitiated state of the bile, or to some affection of the stomach, which it is perhaps not easy to define. It is sometimes a concomitant of other bilious symptoms; and when this happens to be the case, it cannot easily be mistaken; but we sometimes find it occurring singly, and in general attacking persons of a sedentary life. Dr Stoll of Vienna, who has noticed this cough, has very properly given it the name of *tussis stomachica*. This complaint is so far from being relieved by bleeding, that it constantly grows worse after it, especially if the evacuation is in any considerable quantity. The oily remedies seldom fail to exasperate

† See Inhaler.

PRACTICE asperate this cough, which at first is dry, frequent, and often extremely violent, but which seldom fails to give way to one or two gentle pukes, and the occasional use of mild purges. The cough, as in other cases, often continues from habit after the cause that gave rise to it has been removed, and may then be checked by opiates.

When the disease has been neglected, or our attempts to remove it in the beginning have failed, both of which circumstances but too frequently happen, the patient begins to complain of a forenefs, and of slight lancinating pains shooting through the breast, sometimes in the direction of the mediastinum, and sometimes confined chiefly to one side. The forenefs is pretty constant, and much increased by the cough. The pain in the side often prevents the patient from lying on the side affected; and this inability of lying, except on one side, frequently occurs even when no such pain is felt. In this stage of the disease, flushing heats are felt in the palms of the hand and soles of the feet: the breathing is short and laborious; and it is not long before the patient begins to expectorate a thin and frothy phlegm, at first in small quantities, coughed up with difficulty and forenefs, and now and then streaked with blood: this may be considered as the *inflammatory period* of the disease, to which succeeds the *suppurative stage*. In the latter, the expectoration becomes more copious and purulent, the breath proportionably offensive, and the exacerbations of the hectic more considerable: an increased quickness of the pulse comes on about the middle of the day; but the most considerable paroxysm of the fever is at night, and at first continues till towards morning, commonly till three or four o'clock, when it terminates in a sweat, which usually begins upon the breast. As the disease advances, these sweats become more profuse, and sometimes come on almost as soon as the pulse begins to quicken, but without affording any relief to the patient. During the exacerbations, we observe a circumscribed redness of the cheeks, while the rest of the face is pale, and appears as if it were not clean washed. The costiveness that commonly accompanies the beginning of the disease is usually succeeded by a diarrhoea; the spitting lessens, and all the purulent matter seems to be carried downwards. The wasting of the fat and the loss of nourishment occasion the nails to curve inwards, the hair to fall off, and the eyes to sink in their sockets. In the mean time, the legs commonly swell; till at length death closes a scene which is melancholy to all but the patient himself, who in general continues sensible to the last moment, and even then indulges a vain hope of prolonging a miserable existence. In some cases, and that not unfrequently, a delirium comes on towards the close of the disease.

The hectic fever that attends this and some other chronic diseases, is evidently the effect of acrimony, and most commonly of pus absorbed and carried into the circulation. The nature of this acrimony, and the different irritability of different patients, are probably the sources of the variety we observe in fevers of this denomination; a variety which is doubtless much greater than we are aware of. Thus we find that the matter of the small-pox excites a fever of this kind; but this *secondary fever*, as it is

called, differs from the hectic attendant on consumption; nor does the latter correspond with that which sometimes accompanies the suppuration of a cancerous ulcer. In the pulmonary consumption, or at least in the third stage of it, the fever induced is truly of the putrid kind, and has been well denominated *febris hellica putrida* by the judicious Morton, who considers it as being combined with a peripneumonic or inflammatory fever, which recurs as often as fresh tubercles begin to inflame. For although we have named one period of the disease the *inflammatory*, and another the *suppurative period*, yet we are not to suppose that the latter is exempt from inflammation. While matter is poured into the bronchiae, or absorbed and carried into the system from one part of the lungs, other parts are in a crude state of inflammation, or advancing towards suppuration; so that, on examining the lungs of persons who die consumptive, we find some tubercles that are small and just formed, some that are large and full of matter, and others that are in a state of ulceration. This easily accounts for the occasional combination of inflammatory symptoms with those of the putrid hectic. When the matter absorbed is a laudable pus, as in the case of a psoas abscess, we find the form of the hectic differing from either of those we have mentioned.

*Cure.* In these different periods of the disease, the curative indications are sufficiently obvious. To prevent the formation of fresh tubercles; to obviate the inflammation of those already formed; to promote their resolution; to allay morbid irritability, the cough, and other troublesome symptoms; and, above all, to check the tendency to hectic,—are the views that every rational physician proposes to himself in the treatment of the genuine consumption. We know of no medicines that can exert their specific effects upon the lungs by dissolving tuberculous concretions; nor is it probable, from what we know of the animal economy, that any such will ever be discovered. Yet medicines that operate in a general manner upon the system, may, by promoting absorption, and diminishing the determination to the lungs, tend to disperse tubercles, or to prevent their formation. There are not wanting instances of wonderful recoveries in cases where the evil was supposed to be beyond the power of physic; and in some, where nature was left to herself; so that a physician who has observed the various and powerful resources nature has within herself, will be very cautious how he asserts that a disease is incurable.

The most formidable effects of ulcerated lungs are the absorption and consequent hectic. It seems evident, that, in many cases, death is brought on by this, rather than by the lungs themselves being rendered unfit for the purposes of respiration. So that if we can obviate the effects of the absorption, diminish the preternatural determination to the lungs, and fulfil the other general indications just now mentioned, we may very often enable nature to recover herself. It may be alleged indeed, that the physician's art has hitherto proved very unsuccessful in these cases; but may not this be owing to the remedies that are adopted being very often such as are inimical to the cure?

The bark is, perhaps, the most commonly employed of any, and often confined in as an ultimate resource in these cases. But besides this, the elixir of vitriol, the



\* *Disser-  
sur la Phibi-  
sie.*

† *Med. Obs.  
and Inq.  
vol. 5.*

the balsams, and frequent bleedings, have each had their partizans. The use of blisters and issues, opiates, a milk and vegetable diet, exercise, and change of air, are pretty generally recommended by all. Concerning the bark, Desault\* long ago observed, that it had been productive of great mischief in consumptive cases; and Dr Fothergill, in a paper lately published by him † on this subject, very judiciously remarks, that the bark is so far from curing the hectic arising from distempered lungs, that, according to the best of his observations, it not only takes up that time which might probably have been better employed in the use of other medicines, but for the most part aggravates the disease beyond remedy. Indeed it will be found by every attentive observer, that, whenever pus, or any kind of matter excites an hectic, by being absorbed and carried into the circulation, the bark will never fail to exasperate the complaint, especially if it is accompanied with any degree of inflammatory diathesis, unless the matter has a free outlet from the system; as in the case of abscesses, for instance, in which we often find the bark productive of excellent effects. It is likewise well known to be used as a tonic, to obviate the effects of fluor albus, or any other immoderate evacuation in delicate persons, which, by enfeebling the system, very often lays the foundation of phthisis: but the moment we have reason to suspect that the lungs are ulcerated, it ought to be laid aside; and in the genuine tuberculous consumption, it is at all times inadmissible.

Dr Fothergill, however, observes, that there are two causes of consumptions, which often produce symptoms so similar to those of the genuine phthisis, as sometimes to have led him to make use of the bark in apparent tendencies to a genuine pulmonary consumption with advantage.

One of these causes is, the suckling of children longer than is consistent with the mother's ability. This case frequently occurs among the middling and lower classes of females of constitutions naturally delicate and tender. In such a state of weakness, some slight cold brings on a cough, which increases gradually, till at length it produces the true pulmonary consumption. Here the bark given early, in moderate doses, and merely as a tonic remedy, is often of excellent use.

Another cause is, any weakening discharge, either from abscesses, the greater operations of surgery, a copious and constant *fluor albus*, or similar enfeebling evacuations. That the bark is, for the most part, of use in these cases, when the lungs are not inflamed, is indubitable; and if they are so affected, but not beyond a certain degree, it is also efficacious in preventing the progress of the consumption.

In phthisical complaints succeeding such situations, a prudent trial of the bark seems necessary. Small doses of the decoction, either alone, or joined with the saline mixture or such other additions as the physician thinks proper, may be given. But if the breath becomes more tight and oppressed, the cough dry, the pulse more quick and hard, and especially if slight transitory pains or stitches about the thorax are more frequently complained of, a perseverance in the use of the bark will increase the disease. If such also should be the appearances in the progress of the dis-

ease, or, from whatever cause, if the bark is accompanied with such effects, the use of it ought to be withheld.

If, on the other hand, no pain, tightness, or oppression, is perceived, and there appears a manifest abatement of the symptoms, it will be advisable to proceed. The administration of this medicine, however, requires a judicious observer; and it ought neither to be given in the early inflammatory stage of this disease, nor be continued in any subsequent period, if it produces the effects abovementioned.

By its tonic virtues it will often enable nature to conquer many difficulties. In confirmation of this remark, Dr Fothergill farther observes, that he has seen it of use in promoting expectoration, when this became deficient from want of strength towards the end of peripneumonic fevers; but that it stops this discharge, changes slight wandering pains into such as are fixed, and increases them with all their consequences, in a variety of cases.

The elixir of vitriol is often exhibited in consumptive cases, with no less impropriety than the bark. This medicine, from its astringency, is obviously improper in the inflammatory state of the disease. But in the latter stage, when a general tendency to putrefaction takes place, it is serviceable in resisting the effect; it restrains the colliquative sweats; and if the lungs are not injured past repair, it is allowed to be a very useful auxiliary.

Various are the opinions concerning the efficacy of Bristol-water in this disease. The experienced author last mentioned informs us, that he has seen many persons recover from pulmonary diseases after drinking these waters, whose cure seemed to be doubtful from any other process; and he thinks this circumstance, added to the general reputation of Bristol-waters in phthisical cases, affords sufficient inducement to recommend the trial of them in the early stage of such complaints. It is, however, before the approach of a confirmed phthisis that patients ought to repair to Bristol; otherwise a journey thither will not only be without benefit, but may even prove detrimental.

Some have imagined, that the journey, a better air, change of situation and of objects, have contributed to the patient's recovery; and these may doubtless be of advantage. It seems, however, that the water drank fresh at the pump, actually contains principles conducive to the recovery of patients affected with phthisical complaints. It seems to possess a slight calcareous stypticity, and perhaps the air it contains may also have an antiseptic quality. On the whole, it appears to be an efficacious medicine, and is often found of remarkable benefit to consumptive patients.

Change of air, sometimes even from good to bad, is of great consequence in all chronic diseases of the lungs. In consumptive cases, however, the air of all large cities is found to be particularly injurious.

A sea-voyage has been much recommended in the cure of this disease. The benefit of exercise has also been strongly urged by many writers; but, however salutary when properly used, it certainly ought to be regulated with discretion. Dr Dickson declares himself of opinion, that riding on horseback in consumptive cases is most commonly hurtful, without such regulations as in general have been little regard-

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For instance, he has known a person who, by a ride of an hour or two in the morning, was very much recruited, and who, at another time, in the afternoon and evening, without undergoing more bodily motion, has returned faint and languid, and apparently worse. This observation on the same person has been so frequently made, as to point out clearly the times when this exercise shall not do hurt in consumptive cases. In this disease, the pulse, however calm in the morning, becomes more frequent in the afternoon and night, attended with heat and other feverish symptoms. Exercise therefore, at this time, can only add to the mischief of the fever. For this reason he prudently recommends to all hectic persons, especially those who shall travel to distant places on account of a better air, or the benefit expected from any particular water, that their travelling should be slow, confined to a very few hours, and only in the morning.

Horse-exercise, however, seems to be chiefly beneficial in those cases where consumption is a secondary disease. For example, in the nervous atrophy; in the hypochondriacal consumption; or when it is the effect of long-continued intermittents, or of congestions in any of the abdominal viscera; or in a word, whenever the consumption is not attended with an inflamed or ulcerated state of the lungs; long journeys on horseback will be beneficial. Such a practice may likewise be highly useful in obviating an attack of phthisis, or in carrying off a dry husky cough in a person of a consumptive habit, when there is reason to suppose that no tubercles are as yet formed. On the other hand, in the confirmed phthisis, when the lungs are inflamed or ulcerated, much or violent exercise will be improper; and there have been instances where the death of the patient was evidently accelerated by it. The exercise therefore should be gentle, proportioned to the strength of the patient, and employed only in the morning. In fine weather, an easy open carriage is perhaps the most eligible, not only on account of its being open to the air, but because it affords that kind of agitation which is most wanted in these cases. For if we consider the different modes of exercise, we shall find that walking, though the best exercise in health, as it employs the most muscles, is the worst for the sickly, who should have the benefit of exercise without fatigue. Riding on horseback agitates the viscera more than walking, and is therefore preferable to it in many chronic diseases; but when a preternatural determination to the lungs has taken place, it will be liable to increase the evil, and may likewise be hurtful by the fatigue that attends it. For these reasons it will be prudent to begin with a carriage; and if the patient gains strength, and the disease abates, recourse may afterwards be had to horse-exercise.

The gentle motion of a coach has been often found of great utility in pulmonary complaints. Its efficacy seems to depend chiefly on its increasing the determination to the surface of the body. The nausea which this motion excites in some persons is an effect of this increased determination. It has therefore been found beneficial in hæmoptysis; and Dr Simmons mentions the case of a lady, who, after trying various remedies to no purpose, was cured of this complaint by travel-

ling several hundred miles through different parts of England in her own coach. At first, whenever she tarried three or four days in any place, the disorder began to return again; but at length by persevering in her journeys, it gradually went off. Default, who practised at Bourdeaux about 40 years ago, tells us, he sent several consumptive patients to Baresges, and with good success; but that in these cases his reliance was not so much upon the Baresges waters, as upon the motion of the carriage and the change of air in a journey of more than 100 leagues.

It is now pretty generally acknowledged, that the good effects of sea-voyages in consumptive cases depend more upon the constant and uniform motion of the ship, than upon any particular impregnation of the sea-air; although this from its coolness may likewise be of great use, especially in the hot months, when sea-voyages are generally undertaken by consumptive patients. The ancients were no strangers to this remedy; and amongst the Romans it was no unusual thing for consumptive patients to sail to Egypt. Pliny observes, that this was done not for the sake of the climate, but merely on account of the length of the voyage.

Many of our English physicians have recommended a voyage to Lisbon in these cases. When this is done, the proper season of the year should be carefully attended to. Dr Simmons knew a gentleman who went thither with symptoms of incipient phthisis, and who experienced some relief during the course of the voyage; but happening to arrive at Lisbon at the beginning of the rainy season, the disease was soon greatly increased, and terminated fatally.

The best adapted diet in consumptive cases, is milk, particularly that of asses. It may however be remarked, that there are constitutions in which this salutary nutriment seem to disagree. A propensity to generate bile, or too strong a disposition to acceffy from a weakness of the digestive organs, both merit attention. Whey, either from cows or goats milk, appears to be more suitable in the former case; and for correcting acidity, lime-water may be added to the milk. The method of adding rum or brandy to asses or cows milk, should be used with great caution: for when added beyond a certain quantity, as is often the case, they not only coagulate the milk, but heat the body; by which means the former disagrees with the patient, and the spirit augments the disease.

In consumptive cases, Dr Simmons observes, that the patient's taste should be consulted; and says that a moderate use of animal-food, where the salted and high-seasoned kinds are avoided, is not to be denied. Shell-fish, particularly oysters, are useful, as well as snails swallowed whole, or boiled in milk.

Repeated bleedings, in small quantities, are considered in consumptive cases as highly advantageous: and in particular circumstances they undoubtedly are so; for instance, when the constitution apparently abounds with blood; when the fluid drawn off is extremely fizy; when there is much pain in the breast; and when venesection is followed by an abatement of every symptom. In these cases, bleeding is certainly proper, and ought to be repeated so long as it seems to be attended with advantage. In very delicate constitutions, however, where the pulse is quick, with some

some degree of fulness, and the blood last drawn considerably fizy, it may not prove equally serviceable.

It deserves to be remarked, that the inflammatory appearance of the blood is not alone a sufficient reason for bleeding; but, in determining the propriety of this evacuation, all other circumstances should be considered; such as the patient's age, strength, habit, and the state of the disease.

A remark which has been judiciously made by Dr Fothergill, ought not to be omitted in the account of this disease. It is, that young delicate females, from the age of 15 or 16, and upwards, are often subject to consumptions. When the disease has advanced considerably, the *menstrues*, if they have made their appearance, most generally cease. This alarms their female friends, and they call upon the physician to use his utmost endeavours for restoring the discharge; believing the cessation of it to be the immediate cause of the phthisical complaint. Induced by their solicitations, medicines have sometimes been administered, that, without obtaining this end, have tended to aggravate the distemper. This deficiency is often of no real disadvantage in those cases; and in many the evacuation would prove injurious, by diminishing the strength, which is already too much impaired. Even small bleedings at the regular periods, have often done more harm than good. A sudden suppression may require bleeding; but when the evacuation fails through want of strength, and from poverty of blood, the renewal of it increases the disease.

Besides these remedies, Dr Simmons strongly recommends a frequent repetition of vomits. Many physicians have supposed that where there is any increased determination to the lungs, vomits do mischief; but our author is persuaded, that instead of augmenting they diminish this determination; and that much good may be expected from a prudent use of this remedy, than which none has a more general or powerful effect on the system. If any remedy is capable of dispersing a tubercle, he believes it to be vomits. The affections of the liver, that sometimes accompany pulmonary complaints, give way to repeated emetics sooner than to any other remedy. In several cases where the cough and the matter expectorated, the flushing heats, loss of appetite, and other symptoms, threatened the most fatal event; the complaints were greatly relieved, and in others wholly removed, by the frequent use of emetics. Other suitable remedies were indeed employed at the same time; but the relief the patients generally experienced after the emetic, was a sufficient proof of its salutary operation. By this, however, our author does not mean that vomits will be useful in every period of the disease, or in every patient. In general, it will be found that the earlier in the disease emetics are had recourse to, the more likely they will be to do good and the less likely to do harm. The cases in which this may be reckoned improper, are commonly those in which the disease is rapid in its progress; or in that stage of it, when there is great debility, with profuse colligative sweats.

In these cases, when an emetic has been administered twice a-week, and the cough is mitigated, the expectoration facilitated, and the other symptoms relieved,

both the patient and the physician will be encouraged to proceed, and to repeat the vomit every other day, or even every day, for several days together, as our author has sometimes done when the good effects of it were obvious.

The choice of emetics to be employed in these cases is by no means a matter of indifference. Carduus tea, chamomile tea, warm water, and others that act by their bulk, and by exciting nausea, relax the tone of the stomach when they are frequently repeated, and of course will be improper. More active emetics are therefore to be preferred; and here some of the preparations of antimony might naturally be thought of. But the operation of these is not confined to the stomach. They produce evacuations by stool, and a disposition to sweat; and are therefore improper in the pulmonary hectic. The mildness and excellence of ipecacuanha as an emetic, are well known; but in these cases Dr Simmons hath often employed the blue vitriol, concerning the effects of which we meet with some groundless assertions in several medical books. Its operation is confined to the stomach; it acts instantaneously, and its astringency seems to obviate the relaxation that is commonly supposed to attend the frequent use of emetics. In two cases he experienced its good effects, after vomits of ipecacuanha had been given ineffectually. It should be administered in the morning, and in the following manner:

Let the patient first swallow about half a pint of water, and immediately afterwards the vitriol dissolved in a cupfull of water. The dose of it must be adapted to the age and other circumstances of the patient, and may be varied from two grains to ten, fifteen, or twenty. As some persons are much more easily puked than others, it will be prudent to begin with a small dose: not that any dangerous effects will be produced by a large one, for the whole of the medicine is instantly rejected; but if the nausea is violent and of long continuance, the patient may perhaps be discouraged from repeating it. In general, the moment the emetic has reached the stomach it is thrown up again. The patient must then swallow another half pint of water, which is likewise speedily rejected; and this is commonly sufficient to remove the nausea.

Dr Marryat, in his *New Practice of Physic*, prescribes with great freedom what he calls the *dry vomit*, from its being directed to be taken without drinking. This medicine consists of blue vitriol and the emetic tartar; but its good effects have not yet been ascertained by other practitioners.

Besides the use of internal remedies in pulmonary affections, physicians have often prescribed the steams of resinous and balsamic substances to be conveyed into the lungs. The vapour of dulcified spirit of vitriol, dropt into warm water, has likewise been used in these cases, and is advertised as a nostrum under the name of *ather*. The inhaling of fixed air has also been spoken of as an useful practice. Dr Simmons hath seen all of these methods tried at different times; but without being able to perceive any real advantages from them in the suppurative stage of the disease, where they might be expected to be of the greatest use; and in the beginning he hath often found the two first to be too stimulating. He therefore



for preferred the simple vapour of warm water, and hath experienced its excellent effects in several instances: but when the complaint has made any considerable progress, its utility is less obvious; and when the patients have been much weakened, he hath seen it bring on profuse sweats, especially when used in bed, and therefore generally recommended it to be used in the day-time. Formerly he made use of a fumigating machine, described in the gentleman's magazine for 1748, in which the air, inspired by the patient, is made to pass through hot water, by means of a tube that communicates with the external air, and with the bottom of the vessel: but we have now a more elegant, and (on account of the valve and mouth-piece) a more useful, instrument of this kind, invented by the ingenious Mr Mudge. See INHALER.

Another remedy recommended by some as a specific in consumptions, is the earth-bath. Van Swieten, in his Commentaries on Boerhaave, tells us, from the information of a person of credit, that in some parts of Spain they have a method of curing the phthisis pulmonalis by the use of this remedy; and he quotes the celebrated Solano de Luque in confirmation of this practice. Solano speaks of the *banos de tierra*, or earth-baths, as a very old and common remedy in Granada and some parts of Andalusia, in cases of hectic fever and consumptions; and relates several instances of their good effects in his own practice. The method he adopted on these occasions was as follows: He chose a spot of ground on which no plants had been sown, and there he made a hole large and deep enough to admit the patient up to the chin. The interstices of the pit were then carefully filled up with the fresh mould, so that the earth might every where come in contact with the patient's body. In this situation the patient was suffered to remain till he began to shiver or felt himself uneasy; and during the whole process, Solano occasionally administered food or some cordial medicine. The patient was then taken out, and, after being wrapped in a linen cloth, was placed upon a mattress, and two hours afterwards his whole body was rubbed with an ointment composed of the leaves of the *solanum nigrum* and hog's lard. He observes, that a new pit must be made every time the operation is repeated; and advises the use of these baths only from the end of May to the end of October. Dr Fouquet, an ingenious French physician, has tried this remedy in two cases. In one, a confirmed phthisis, he was unsuccessful; but the remedy had not a fair trial. The patient, a man 30 years of age, had been for several months afflicted with cough, hectic fever, and profuse colligative sweats. He was first put into the earth in the month of June; but soon complained of an uneasy oppression at his stomach, and was removed at the end of seven minutes. The second time he was able to remain in it half an hour, and when taken out was treated in the way prescribed by Solano. In this manner the baths were repeated five times, and the patient was evidently relieved; but having conceived a dislike to the process, he refused to submit to any further trials, and died some months afterwards. In the second case he was more fortunate: the patient, a girl 11 years of age, had been for three months troubled with a cough brought on by the measles, which

was at length attended with a purulent expectoration, hectic fever, and night-sweats. She began the use of the earth-bath in August, and repeated it eight times in the space of 20 days. At the end of that time the fever and disposition to sweat had entirely ceased, and by the use of the common remedies the patient was perfectly restored. A physician at Warlaw has likewise prescribed the earth-bath with good success in cases of hectic fever. The Spaniards confine it entirely to such cases; but in some other parts of the world we find a similar method employed as a remedy for other diseases, and particularly for the scurvy. Dr Priestley observes, that the Indians, he has been told, have a custom of burying their patients labouring under putrid diseases, up to the chin in fresh mould, which is also known to take off the fetor from flesh-meat beginning to putrefy. The rancidity of a ham may likewise be corrected by burying it for a few hours in the earth. The efficacy of this remedy in the sea-scurvy has frequently been experienced by the crews of our East India ships. See below.

Solano, who is fond of philosophizing in his writings, is of opinion, that the earth applied in this way absorbs the morbid taint from the system; but does it not seem more probable, that the effluvia of the earth, by being absorbed and carried into the circulation, correct the morbid state of the fluids, and thus are equally useful in the sea-scurvy and in the pulmonary hectic? That the earth when moistened does emit a grateful odour is a fact generally known; and Baglivi long ago gave his testimony in favour of the grateful effects of the effluvia of fresh earth. He ascribes these good effects to the nitre it contains.

With regard to the drains, such as blisters, issues, and setons, that are so frequently recommended in pulmonary complaints, there is less danger of abuse from them, than from the practice of venesection. The discharge they excite is not calculated to weaken the patient much; and the relief they have so often been found to afford, is a sufficient reason for giving them a trial. Blisters, as is well known, act in a twofold manner; by obviating spasm, and producing revulsion: Issues and setons act chiefly in the latter of these two ways; and in this respect their effects, though less sudden and less powerful at first, are more durable from the continuance of the discharge they occasion. It is perhaps hardly necessary to remark, that, if much service is to be expected from either of these remedies, they should be applied early in the disease. The ingenious Mr Mudge, who experienced the good effects of a large capsular issue on his own person, very properly observes, that the discharge in these cases ought to be considerable enough to be felt. But it is seldom possible for us to prevail on the delicate persons, who are most frequently the victims of this disease, to submit to the application of a caustic between the shoulders. The discharge produced by a seton is by no means inconsiderable; and as in these cases there is generally some inflammatory stich, some part of the breast that is more painful or more affected by a deep inspiration than the rest, a seton in the side, as near as can be to the seat of the inflammation, will be an useful auxiliary. Our author has seen it evidently of great use in several cases.

GENUS XL. HÆMORRHOIS, the HÆMORRHODS  
or PILES.

Hæmorrhoides, *Sauv.* gen. 217. *Lin.* 192. *Sag.* gen. 182.  
Hæmorrhoidalis fluxus. *Hoffm.* 219.  
Hæmorrhoides, *Junc.* 11. and 12.  
Leucorrhoides, *Vog.* 112.

354 LXXXIX. The External BLOODY PILES. Sp. I.  
Var. A.

Hæmorrhoides moderata, *Sauv.* sp. 1.  
Hæmorrhoides ordinata, *Junc.* 11.  
Hæmorrhoides nimia, *Junc.* 11.  
Hæmorrhoides immodica, *Sauv.* sp. 2.  
Hæmorrhoides excedentes, *Alberti.* de hæmorrhoid. p. 179.  
Hæmorrhoides polyposa. *Sauv.* sp. 3.

## 355 XC. Mucous PILES. Sp. I. Var. B.

Hæmorrhoides decoloratæ, albæ, et mucidæ, *Junc.* 13. *Alberti.* p. 248.

## 356 XCI. THE PILES from a Procidencia Ani. Sp. II.

Hæmorrhoides ab exania, *Sauv.* sp. 4.

## 357 XCII. The Running PILES. Sp. II.

## 358 XCIII. The Blind PILES. Sp. IV.

Hæmorrhoides cæcæ, *Junc.* 12. *Alberti.* p. 274.

*Description.* THE discharge of blood from small tumours on the verge of the anus constitutes what is called the *hæmorrhoids* or *piles*. They are distinguished into the *external* and *internal*, according to the situation of the tumours, either without or within the anus. Sometimes, however, these tumours appear without discharging any blood; and in this case they are called the *hæmorrhoides cæcæ* or *blind piles*. Sometimes the disease appears without the verge of the anus in distinct separate tumours; but frequently only one tumid ring appears, seeming as it were the anus pushed without the body. Sometimes these tumours appear without any previous disorder of the body; but more frequently, before the blood begins to flow, and sometimes even before the tumours are formed, various affections are perceived in different parts of the body; as head-ach, vertigo, stupor, difficulty of breathing, sickness, colic pains, pain of the back and loins, and frequently a considerable degree of pyrexia; while along with these symptoms there is a sense of fullness, heat, itching, and pain, in and about the anus. Sometimes the disease is preceded by a serous discharge from the anus; and sometimes this serous discharge, accompanied with swelling, seems to come in place of the discharge of blood, and to relieve the above-mentioned disorders of the system. This serous discharge hath therefore been named the *hæmorrhoides alba*.

In this disease the quantity of blood discharged is different upon different occasions. Sometimes it flows only when the person goes to stool, and commonly follows the discharge of feces. In other cases it flows without any discharge of feces; and then generally in consequence of the disorders above-mentioned, when it is also commonly in larger quantity.

This is often very considerable; and, by the repetition, so great, that we could hardly suppose the body to bear it but with the hazard of life. Indeed, though rarely, it has been so great as to prove suddenly fatal, as probably was the case with *ARIUS* and *COPERNICUS*.—These considerable discharges occur especially to persons who have been frequently liable to the disease. They often induce great debility, and frequently a leucophlegmatia or dropsy which proves fatal. Sometimes the tumours and discharges of blood in this disease recur exactly at stated periods. In the decline of life it frequently happens, that the hæmorrhoidal flux, formerly frequent, ceases to flow; and in that case it generally happens that the persons are affected with apoplexy or palsy. Sometimes hæmorrhoidal tumours are affected with inflammation, which ends in suppuration and gives occasion to the formation of fistulous ulcers in those parts.

The hæmorrhoidal tumours have often been considered as varices or dilatations of the veins; and in some cases varicose dilatations have appeared upon dissection. These, however, do not appear; and Dr Cullen is of opinion that they are usually formed by an effusion of blood into the cellular texture of the intestine near to its extremity. When recently formed they contain fluid blood, but after they remain for some time they are usually of a firmer consistence.

*Causes, &c.* It would seem probable, that the hæmorrhoidal tumours are produced by some interruption of the free return of the blood from the rectum, by which a rupture of the extremities of the veins is occasioned. But considering that the hæmorrhage occurring here is often preceded by pain, inflammation, and a febrile state, and with many other symptoms which shew a connection of the topical affection with the state of the whole system, it is probable that the interruption of the venous blood produces a considerable resistance to the motion of the venous blood through the arteries, and consequently that the discharge of blood is commonly from the latter. Some have thought, that a difference of the hæmorrhoides, and of its effects upon the system, might arise from the difference of the hæmorrhoidal vessels from whence the blood issued. But Dr Cullen is of opinion, that we can scarce ever distinguish the vessels from which the blood flows; and that the frequent inoculations of both arteries and veins belonging to the lower extremity of the rectum, will render the effects of the hæmorrhage much the same, from whatever source it proceeds.

With regard to the hæmorrhoids, however, the author is of opinion, that they are, for the most part, merely a topical affection. They take place before the period of life at which a venous plethora happens. They happen to females, in whom a venous plethora determined to the hæmorrhoidal vessels cannot be supposed; and they happen to both sexes, and to persons of all ages, from causes which do not affect the system, and are manifestly suited to produce a topical affection only.

These causes are, in the first place, the frequent voiding of hard and bulky feces, which, by their long stagnation in the rectum, and especially when voided, must necessarily press upon the veins of it, and interrupt

Upon the sphincter's being a little relaxed, as it is immediately after its strong contraction, the portion of the gut which had fallen out is commonly taken into the body again; but by the frequent repetition of the accident, the size and fulness of the ring formed by the prolapsed intestine is much increased. It is therefore more slowly and difficultly replaced; and in this consists the chief uneasiness of hæmorrhoidal persons. As the internal edge of this ring is necessarily divided by clefts, the whole often puts on the appearance of a number of distinct swellings; and it also frequently happens, that some portions of it are more considerably swelled, become more protuberant, and form those small tumours more strictly called *hæmorrhoids* or *piles*.

From considering that the pressure of the feces, and other causes interrupting the return of venous blood from the lower extremity of the rectum, may operate a good deal higher up than that extremity, we may understand how tumours may be formed within the anus; and probably it also happens, that some of the tumours formed without the anus may continue when taken within the body, and even be increased by the causes just mentioned. Thus may the production of internal piles be explained, which, on account of their situation and bulk, are not protruded on the person's going to stool, and are therefore more painful.

The production of piles is particularly illustrated by this, that pregnant women are frequently affected with the disease.—This is to be accounted for, partly by the pressure of the uterus upon the rectum, and partly by the costive habit to which pregnant women are liable. Dr Cullen hath known many instances of piles happening for the first time during the state of pregnancy; and there are few women who have born children, that are afterwards entirely free from piles.—Purgatives also, especially those of the more acrid kind, and particularly aloetics, are apt to produce the piles, when frequently used; and as they stimulate particularly the great guts, they may be justly reckoned among the exciting causes of this disease.

*Prognosis.* Though the hæmorrhoids are commonly, as we have said, to be esteemed a topical disease, they may, by frequent repetition, become habitual and connected with the whole system; and this will more readily happen in persons who have been once affected with the disease, if they are frequently exposed to a renewal of the causes which occasioned it. It happens also to persons much exposed to a con-

gestion in the hæmorrhoidal vessels, in consequence of their being often in an erect position of the body, and in an exercise which pushes the blood into the depending vessels, while at the same time the effects of these circumstances are much favoured by the abundance and laxity of the cellular texture about the anus. It is to be particularly observed, that when the hæmorrhoidal disease has either been originally or has become a systematic affection, it then acquires a particular connection with the stomach; so that certain affections of the stomach excite the hæmorrhoidal disease, and certain states of this disease excite the disorders of the stomach.

It hath been an almost universally received opinion, that the hæmorrhoidal flux is a salutary evacuation, which prevents many diseases that would otherwise have happened; and that it even contributes to give long life: and as this opinion hath been strenuously adopted by Dr Stahl, it hath had a very considerable influence on the practice of physic in Germany. But Dr Cullen maintains that we can never expect to reap much benefit from this flux, which at first is purely topical; and, granting that it should become habitual, it is never proper to be encouraged. It is a nasty, disagreeable disease; ready to go to excess, and thereby to prove hurtful, and sometimes even fatal. At best it is liable to accidents, and thus to unhappy consequences. He is therefore of opinion, that even the first approaches of the disease are to be guarded against; and that, though it should have proceeded for some time, it ought always to be moderated, and the necessity of it superseded.

*Cure.* When any evident cause for this disease is perceived, we ought immediately to attempt a removal of that cause. One of the most frequent remote causes is an habitual costiveness; which must be obviated by a proper diet, as the person's own experience will best direct; or if the management of diet be not effectual, the belly must be kept open by medicines, which may prove gently laxative, without irritating the rectum. In most cases it will be of advantage to acquire a habit with regard to time, and to observe it exactly. Another cause of the hæmorrhoids to be especially attended to is the prolapsus ani, which is apt to happen on a person's having a stool. If this shall occur to any considerable degree, and be not at the same time easily and immediately replaced, it most certainly produces piles, or increases them when otherwise produced. Persons therefore who are liable to this prolapsus, should, after having been at stool, take great pains to have the gut immediately replaced, by lying down in an horizontal posture, and pressing gently upon the anus, till the reduction shall be completely obtained. When this prolapsus is occasioned only by the voiding of hard and bulky feces, it is to be removed by obviating the costiveness which occasions it. But in some persons it is owing to a laxity of the rectum; and in those it is often most considerable on occasion of a loose stool. In these cases, it is to be treated by astringents, and proper artifices to keep the gut in its place.

When the disease has frequently recurred from neglect, and is thus in some measure established, the methods above-mentioned are no less proper; but in



this case some other measures must also be used. It is especially proper to guard against a plethoric state of the body; and therefore to avoid a sedentary life, full diet, and intemperance in the use of strong liquor, which in all cases of hæmorrhagy is of the most pernicious consequence.

Exercise of all kinds is of great service in obviating and removing a plethoric state of the body; but upon occasion of the hæmorrhoidal flux, when this is immediately to come on, both walking and riding, as increasing the determination of the blood into the hæmorrhoidal vessels, are to be avoided. At other times, when no such determination is already formed, these modes of exercise may be very properly employed.

Another method of removing plethora is by cold bathing; but this must be employed with caution. When the hæmorrhoidal flux is approaching, it may be dangerous to divert it; but during the intervals of the disease, cold bathing may be employed with safety and advantage; and in those who are liable to a prolapsus ani, the frequent washing of the anus with cold water may be useful.

When the flux has actually come on, we are to moderate it as much as possible, by causing the patient lie in a horizontal posture on a hard bed; by avoiding exercise in an erect posture, using a cool diet, and avoiding external heat. But with respect to the further cure of this disease, we must observe, that there are only two cases in which it is common for hæmorrhoidal persons to call for medical assistance. The one is, when the affection is accompanied with much pain; and the other, when the piles are accompanied with excessive bleeding. In the first case, we must consider whether the piles are external or internal. The pain of the external piles happens especially when a considerable protrusion of the rectum has happened; and while it remains unreduced, it is strangled by the constriction of the sphincter; and at the same time no bleeding happens to take off the swelling of the protruded portion of the intestine; and sometimes an inflammation supervenes, which greatly aggravates the pain. In this case, emollient fomentations and poultices are sometimes of service, but the application of leeches is generally to be preferred.

In case of excessive bleeding, we are on all occasions to endeavour to moderate the flux, even where the disease has occurred as a critical discharge; for if the primary disease shall be entirely and radically cured, the preventing any return of the hæmorrhoids seems entirely safe and proper. It is only when the disease arises from a plethoric habit, and from a stagnation of blood in the hypochondriac region, or when, though originally topical, it hath by frequent repetition become habitual, and has thereby acquired a connection with the system, that any doubt can arise about curing it entirely. In any of these cases, however, Dr Cullen is of opinion that it will be proper to moderate the bleeding, left, by its continuance or repetition, the plethoric state of the body, and the particular determination of the blood into the hæmorrhoidal vessels, be increased, and the return of the disease be too much favoured. Dr Stahl is of opinion, that the hæmorrhoidal flux is never to be accounted excessive excepting when it occasions great debility or leucophlegma-

tia: but Dr Cullen is of opinion, that the smallest approach towards producing either of these effects should be considered as an excess which ought to be prevented from going farther; and even in the cases of congestion and plethora, if the plethoric habit and tendency can be obviated and removed, the hæmorrhoidal flux may then with safety be entirely suppressed. In all cases therefore of excessive bleeding, or any approach to it, astringents both internal and external may be safely and properly applied; not indeed to induce an immediate and total suppression; but to moderate the hæmorrhage, and by degrees to suppress it altogether; while at the same time measures are taken for the removing the necessity of its recurrence. In case of a connection between the hæmorrhoidal affection and the state of the stomach, the same method is to be used in the atonic gout.

#### GENUS XLI. MENORRHAGIA, or *Immoderate Flow of the Menses.*

- Menorrhagia, *Sauv.* 244. *Lin.* 202. *Vog.* 96.  
 Metrorrhagia, *Sag.* gen. 179.  
 Uteri hæmorrhagia, *Hoffm.* II. 224.  
 Hæmorrhagia uterina, *Junk.* 14.  
 Leucorrhœa, *Sauv.* gen. 267. *Lin.* 201. *Vog.* 119.  
*Sag.* gen. 202.  
 Cachexia uterina, five fluor albus, *Hoffm.* III. 348.  
 Fluor albus, *Junk.* 133.  
 Abortus, *Sauv.* gen. 245. *Lin.* 204, *Sag.* gen. 180.  
*Junk.* 92.  
 Abortio, *Vog.* 97.  
 Fluor uterini sanguinis, *Boerh.* 1303.  
 Convulsio uteri, five abortus, *Hoffm.* III. 176.

#### XCII. The *Immoderate Flow of the Menses*, properly so called. Sp. I.

359

- Menorrhagia immodica, *Sauv.* sp. 3.  
 Menorrhagia illititia, *Sauv.* sp. 2.

*Description.* The quantity of the menstrual flux is different in different women, and likewise in the same woman at different times. An unusual quantity therefore is not always to be considered as morbid: but when a larger flow of the menses has been preceded by head-ach, giddiness, or dyspnoea; has been ushered in by a cold stage, and is attended with much pain of the back and loins, with a frequent pulse, heat and thirst; it may then be considered as preternaturally large. On the other hand, when the face becomes pale, the pulse weak, an unusual debility is felt in exercise, and the breathing is hurried by little labour; when the back becomes pained from any continuance in an erect posture, when the extremities become frequently cold, and when at night the feet appear affected with œdematous swelling; from all these symptoms we may conclude, that the flow of the menses hath been immoderate, and has already induced a dangerous state of debility.—The debility, induced in this case, often appears also by affections of the stomach, an anorexia, and other symptoms of dyspepsia; by a palpitation of the heart, and frequent faintings; by a weakness of mind, liable to strong emotions from slight causes, especially those presented by surprise. A flow of the menses attended with barrenness in married women, may generally be considered

considered as preternatural and morbid. Generally, also, that flow of the menses may be followed by immo-  
derate, which is preceded and followed by a leu-  
corrhœa.

*Causes, &c.* The proximate cause of the menor-  
rhagia is either the effort of the uterine vessels preter-  
naturally increased, or a preternatural laxity of the  
extremities of the uterine arteries.—The remote causes  
may be, 1. Those which increase the plethoric state  
of the uterine vessels; as a full and nourishing diet,  
much strong liquor, and frequent intoxication. 2.  
Those which determine the blood more copiously  
and forcibly into the uterine vessels; as violent  
strainings of the whole body; violent shocks from  
falls; strokes or contusions on the lower belly;  
violent exercise, particularly in dancing; and violent  
passions of the mind. 3. Those which particularly  
irritate the vessels of the uterus; as excess in  
venery; the exercise of venery in the time of men-  
struation; a colic habit, giving occasion to violent  
straining at stool; and cold applied to the feet. 4.  
Those which have forcibly overstrained the extremities  
of the uterine vessels; as frequent abortions, frequent  
child-bearing without nursing, and difficult tedious  
labours. Or, lastly, those which induce a general  
laxity; as living much in warm chambers, and drink-  
ing much of warm enervating liquors, such as tea,  
coffee, &c.

*Cure.* The treatment and cure of the menorrhagia,  
must be different, according to the different causes of  
the disease.

In all cases, the first attention ought to be given to  
avoiding the remote causes, whenever that can be  
done; and by such attention the disease may be often  
entirely cured. When the remote causes cannot be  
avoided, or when the avoiding them has been neg-  
lected, and a copious menstruation has come on, it  
should be moderated as much as possible, by abstain-  
ing from all exercise at the coming on or during the  
continuance of the menstruation; by avoiding even an  
erect posture as much as possible; by shunning exter-  
nal heat, and therefore warm chambers and soft beds;  
by using a light and cool diet; by taking cold drink,  
at least as far as former habits will allow; by avoid-  
ing venery; by obviating costiveness, or removing it  
by laxatives which give little stimulus. The sex are  
commonly negligent, either in avoiding the remote  
causes, or in moderating the first beginnings of this  
disease. It is by such neglect that it so frequently  
becomes violent and of difficult cure; and the frequent  
repetition of a copious menstruation may be considered  
as a cause of great laxity in the extreme vessels of the  
uterus.

When the coming on of the menstruation has been  
preceded by some disorder in other parts of the body,  
and is accompanied with pains of the back, somewhat  
like parturient pains, with febrile symptoms, and  
when at the same time the flow seems to be copious,  
a bleeding at the arm may be proper, but is not often  
necessary; and it will in most cases be sufficient to  
employ, with great attention and diligence, those  
means already mentioned for moderating the dis-  
charge.

When the immoderate flow of the menses shall  
seem to be owing to a laxity of the vessels of the

uterus, as may be concluded from the general debility  
and laxity of the person's habit; from the remote  
causes that have occasioned the disease; from the ab-  
sence of the symptoms which denote increased action  
in the vessels of the uterus; from the frequent recur-  
rence of the disease; and particularly from this, that  
the person in the intervals of menstruation is liable to  
a leucorrhœa: in such a case, the disease is to be  
treated, not only by employing all the means above-  
mentioned for moderating the hæmorrhagy, but also  
by avoiding all irritation, every irritation having the  
greater effect in proportion as the vessels are more  
lax and yielding. If, in such a case of laxity, it shall  
appear that some degree of irritation concurs, opiates  
may be employed to moderate the discharge; but in  
using these much caution is requisite. If, notwith-  
standing these measures having been taken, the dis-  
charge shall prove very large, astringents, both exter-  
nal and internal, may be employed. In such cases,  
Dr Cullen asks, May small doses of emetics be of ser-  
vice?

When the menorrhagia depends on the laxity of  
the uterine vessels, it will be proper, in the intervals  
of menstruation, to employ tonic remedies; as cold  
bathing, and chalybeates. The exercises of gestation  
also may be very useful, both for strengthening the  
whole system, and for taking off the determination of  
the blood to the internal parts.

These remedies may be employed in all cases of  
menorrhagia, from whatever cause it may have pro-  
ceeded, if it shall have already induced a considerable  
degree of debility in the body.

### XCIII. ABORTION. Sp. II.

361

Menorrhagia gravidarum, *Sauv.* sp. 6.

Abortus effluxio, *Sauv.* sp. 1.

a. Abortus subtrimestris.

b. Abortus sobsemestris.

c. Abortus octimestris.

Abortus ab uteri laxitate, *Sauv.* sp. 2.

### XCIV. Immoderate Flux of the LOCHIA. Sp. III.

362

Menorrhagia lochialis, *Sauv.* sp. 8.

For the description, treatment, and cure, of these two  
last diseases, see the article MIDWIFERY.

### XC. Immoderate Flow of the MENSES from some

363

Local Disorder. Sp. IV.

Menorrhagia ex hysterotopsi, *Sauv.* sp. 5.

Menorrhagia ulcerosa, *Sauv.* sp. 9.

### XC. The Leucorrhœa, Fluor Albus, or Whites. Sp. V.

364

and VI.

Leucorrhœa, *G. ut supra.*

Menorrhagia decolor, *Sauv.* sp. 7.

Leucorrhœa Americana, *Sauv.* sp. 5.

Leucorrhœa Indica, *Sauv.* sp. 6.

Leucorrhœa Nabothi, *Sauv.* sp. 9.

Leucorrhœa gravidarum, *Sauv.* sp. 8.

*Description.* The *fluor albus*, female weakness, or  
*whites*, as commonly called, is a disease of the womb  
and its contiguous parts; from which a pale coloured,  
greenish or yellow fluid is discharged, attended with  
loss of strength, pain in the loins, bad digestion, and

PRACTICE a wan sickly aspect.

*Causes, &c.* The quantity, colour, and consistence of the discharge chiefly depend upon the time of its duration, the patient's habit of body, and the nature of the cause by which it was produced. Taking cold, strong liquor, immoderate heat and moisture, or violent exercise, are all observed to produce a bad effect, as to its quantity and quality.

Weakly women of lax solids, who have had many children, and long laboured under ill health, are of all others the most subject to this disagreeable disease; from which they unfortunately suffer more severe penance than others, as the nicest sensations are often connected with such a delicacy of bodily frame as subjects them to it.

In Holland it is very frequent, and in a manner peculiar to the place, from the dampness of its situation; the surrounding air being so overcharged with moisture as to relax the body, stop perspiration, and throw it upon the bowels, or womb; producing in the first, a diarrhoea or flux; in the last, the *fluor albus* or female weakness.

The discharge proceeds from the vessels subservient to menstruation; because, in delicate habits, where those vessels are weak, and consequently remain too long uncontracted, the *fluor albus* sometimes immediately follows the menses, and goes off by degrees as they gradually close. It also comes from the mucous glands of the womb, as is particularly evident in very young females of eight and ten years old; in whom, though very rarely, it has been observed, and where it must then necessarily have escaped from those parts; for the uterine vessels are not sufficiently enlarged for its passage at so early a period.

Sometimes, as in women with child, it proceeds from the passage to the womb, and not from the womb itself; which, during pregnancy, is closely sealed up, so that nothing can pass from thence till the time of labour. The application of those instruments called *peffaries*, from the pain and irritation they occasion, are also apt to bring on this discharge. Hence we may conclude, that this disease may happen although the blood is in a pure state. Here the fault seems to be placed in the vessels or strainers, by which the fluids are vitiated and changed from their natural qualities.

The *fluor albus* has been supposed to supply the want of the menses; because, where the first prevails, the last is generally either irregular, or totally wanting; but it might more properly be said, that the presence of the *fluor albus*, which is a preternatural evacuation, occasions the absence of that which is natural; as is evident from the return of the menses after the *fluor albus* has been taken away. Indeed, when this discharge appears about the age of 13 or 14, and returns once a month, with symptoms like those of the menses, then it may be deemed strictly natural, and therefore ought not to be stopped.

*Prognosis.* The *fluor albus* may be distinguished into two kinds. The first arises from a simple weakness, or the relaxation of the solids; which may either be general, where the whole bodily system is enervated and unstrung; or partial, where the womb only is thus affected, in consequence of hard labour, frequent miscarriages, a suppression or immoderate quantity of the menses, or a sprain of the back or loins.

In the first case, the discharge being generally mild, may be safely taken away. In the second, it may proceed from a vitiated, or impure blood, where the body, from thence, is loaded with gross humours, which nature for her own security and relief thus endeavours to carry off. In such cases, the discharge is often of a reddish colour, like that from old ulcerous sores; being sometimes so sharp as to excoriate the contiguous parts, and occasion a smarting and heat of urine.

A deep-seated, darting pain, with a forcing down, attending such a discharge, is a very dangerous and alarming sign, and indicates an ulceration or cancerous state of the womb. This malignant state of the disease, if of long continuance, is extremely difficult of cure; and disposes the patient to barrenness, a bearing down, the dropsy, or a consumption.

*Cure, &c.* The causes of those two kinds of this disease being different, so they will require a very different method of cure. To answer this intention; in the first case, nothing will be more proper than nourishing simple food, such as veal broths, jellies, fresh eggs, and milk diet. The acid fruits will also be proper; and the patient may take a restorative, strengthening infusion, which will give firmness to the body, and assist the weakened fibres of the womb in returning to their natural state.

The same method may be used with success, where the *fluor albus* follows the menses, as already observed.

The Tunbridge or Spa waters may be drank at the same time; and if necessary, an infusion of green tea, or pure smith's-ferge-water, may be used with a womb-syringe as an injection twice a-day. Should the disease prove uncommonly obstinate; the patient may go into the cold bath every other day; and also drink lime-water with milk, which will expedite the cure, and prevent a relapse. A volatile liniment, and afterwards a strengthening plaster, may be applied to the small of the back.

By way of caution, she should abstain from the immoderate use of tea; and be removed into a dry clear air; or if she is obliged to remain in one less proper, she may apply the flesh-brush, and wear a flannel shift next her skin, impregnated with the fumes of burning frankincense, or any of the grateful aromatic gums. Cold spring-water pumped on the loins, or a blistering plaster applied to the bottom of the spine or back, are both very powerful in their effects, and have sometimes succeeded after other remedies had been tried in vain.

In the second sort of the disease, where the discharge is sharp and of long standing, it would be extremely dangerous to suppress it suddenly, either by astringents internally taken, or applied as injections, until the blood is freed from its impurities by proper purgatives, and otherwise corrected by such medicines as not only carry off the sharp scorbutic salts and putrid juices, but also impart to it that soft balmy quality of which it had been deprived.

A purging potion may be taken twice a-week, and in the intervals an alternative pill night and morning. After this course has been continued a fortnight or three weeks, she may begin with the strengthening, bitter infusion, or other tonic, in the quantity of a tea-



ACTICE tea-cupful twice a-day, or more, as her stomach will allow.

The same sort of food and regimen will here be proper as in the first kind of the disease. The patient should abstain from malt liquors, and drink rice-water, in each pint of which half an ounce of gum arabic has been dissolved; or if she is weak, and of a cold bloated habit of body, a little French brandy may be added occasionally.

When she begins to take the bitter infusion, it will be proper to use the Tunbridge or Pyrmont water for common drink; but if those cannot conveniently be had, the artificial Spa water, impregnated with iron and fixed air \*, will make an excellent substitute. If it should render her costive, and occasion the head-ach; she may desist, and drink imperial water or a little fenna-tea sweetened with manna, till those complaints are removed.

In short, as this is a malady of the most disagreeable kind, which, by long continuance or neglect, becomes difficult of cure, and often produces an ulceration of the womb, bearing down, barrenness, a dropsy, or consumption; it were to be wished, that women, on such occasions, would be more attentive to their own safety, by using all possible means, in due time, to prevent those disorders.

Dr Leake says he has attended more patients labouring under the *fluor albus* in the autumn than at any other season of the year, especially when the weather was uncommonly moist and cold: most of them were cured by change of diet, an increased perspiration, and the proper use of Peruvian bark with aromatics. He observed, that several about this time who escaped the disorder, were visited with bad colds, a defluxion of rheum on the throat, or a diarrhoea, which were removed by a similar treatment.

As women are sometimes connected with those who do not conscientiously regard their safety, it is a circumstance of the utmost consequence to distinguish a fresh venereal infection from the *fluor albus* or whites: for, if the first is mistaken for the last, and is either neglected or treated accordingly, the disorder may unfortunately end in a confirmed lues or pox.

The following signs will best inform the patient whether there is occasion for her doubts or not.

A fresh infection, called gonorrhoea, is malignant and inflammatory; the *fluor albus* most commonly arises from relaxation and bodily weakness: and therefore, the remedies proper in the first disorder would render the last more violent, by locking up and confining the infectious matter.

In the gonorrhoea, the discharge chiefly proceeds from the parts contiguous to the urinary passage, and continues whilst the menses flow; but in the *fluor albus*, it is supplied from the cavity of the womb and its passage, and then the menses are seldom regular.

In the gonorrhoea, an itching, inflammation, and heat of urine, are the fore-runners of the discharge; the orifice of the urinary passage is prominent and painful, and the patient is affected with a frequent irritation to make water. In the *fluor albus*, pains in the loins, and loss of strength, attend the discharge; and if any inflammation or heat of urine follow, they happen in a less degree, and only after a long con-

tinuance of the discharge, which, becoming sharp and acrimonious, excoriates the surrounding parts.

In the gonorrhoea, the discharge suddenly appears without any evident cause; but in the *fluor albus*, it comes on more slowly, and is often produced by irregularities of the menses, frequent abortion, sprains, or long-continued illness.

In the gonorrhoea, the discharge is greenish or yellow, less in quantity, and not attended with the same symptoms of weakness. In the *fluor albus*, it is also often of the same colour, especially in bad habits of body, and after long continuance; but is usually more offensive, and redundant in quantity.

All the other kinds of hæmorrhage enumerated by medical writers, are by Dr Cullen reckoned to be symptomatic; as,

STOMACACE, Sauv. gen. 241. Lin. 175. Vog. 85. Sag. gen. 176.

Species: Scorbutica, Purulenta, &c.

HÆMATEMESIS, Sauv. gen. 242. Lin. 184. Vog. 89. gen. 177.

Species: Plethorica, Catamenialis, Scorbutica, &c.

HÆMATURIA, Sauv. gen. 233. Lin. 198. Vog. 92. Sag. gen. 178.

Species: Purulenta, Calculosa, Hæmorrhoidalis, &c.

## ORDER V. PROFLUVIA.

### GENUS XLII. The CATARRH.

Catarrhus, Sauv. gen. 186. Vog. 98. Sag. gen. 145. Coryza, Lin. 174. Vog. 100. Sag. gen. 196.

Rheuma, Sauv. gen. 142.

Tussis, Sauv. gen. 142. Lin. 155. Vog. 205. Sag. gen. 245. 255. Junck. 30.

Tussis catarrhalis et rheumatica, Hoffm. III. 109.

### XCVII. Catarrh from COLD. Sp. I.

365

Catarrhus benignus, Sauv. sp. 1.

Catarrhus peccoreus, Sauv. sp. 6.

Coryza catarrhalis, Sauv. sp. 1.

Coryza phlegmatorrhagia, Sauv. sp. 2. Salmuth.

Obf. cent. 1. 37. Junck. 28. Morgagn. de sed. xiv. 21.

Coryza febricula, Sauv. sp. 6.

Tussis catarrhalis, Sauv. sp. 1. N. Rosen Diss. apud Haller, Disput. Pract. tom. II.

Rheuma catarrhale, Sauv. sp. 1.

Amphimerina catarrhalis, Sauv. sp. 2.

Amphimerina tussiculosa, Sauv. sp. 13.?

Cephalalgia catarrhalis, Sauv. sp. 10.

### Catarrh from CONTAGION. Sp. II.

366

Catarrhus epidemicus, Sauv. sp. 3.

Rheuma epidemicum, Sauv. sp. 2.

Synocha catarrhalis, Sauv. sp. 5.

There are several symptomatic species: as, Catarrhus Rubeculosus; Tussis Variolosa, Verminalis, Calculosa, Phthifica, Hystrica, a Dentitione, Gravidarum, Metallicorum, &c.

Description. The catarrh is an increased excretion of

PRACTICE of mucus from the mucous membrane of the nose, fauces, and bronchiæ, attended with pyrexia.

Practical writers and nosologists have distinguished the disease by different appellations, according as it happens to affect those different parts of the mucous membrane, the one part more or less than the other: but Dr Cullen is of opinion that the disease in those different parts is always of the same nature, and proceeds from the same cause in the one as in the other. Very commonly indeed those different parts are affected at the same time; and therefore there is little room for the distinction mentioned. The disease has been frequently treated of under the title of *tussis*, or *cough*; and a cough, indeed, always attends the chief form of catarrh, that is, the increased excretion from the bronchiæ; but it is so often also a symptom of many other affections, which are very different from one another, that it is improperly used as a generic title.

The disease generally begins with some difficulty of breathing through the nose, and with a sense of some fulness stopping up that passage. This again is often attended with some dull pain and a sense of weight in the forehead, as well as a stiffness in the motion of the eyes. These feelings, sometimes at their very first beginning, and always soon after, are attended with the distillation of a thin fluid from the nose, and sometimes from the eyes; and these fluids are often found to be somewhat acrid, both by their taste and by their fretting the parts over which they pass. These symptoms constitute the *coryza* and *gravedo* of authors, and are commonly attended with a sense of lassitude over the whole body. Sometimes cold shiverings are felt; at least the body is more sensible than usual to the coldness of the air; and with all this the pulse is more frequent than ordinary, especially in the evenings.

These symptoms have seldom continued long before they are accompanied with some hoarseness, and a sense of roughness and soreness in the trachea, with some difficulty of breathing, expressed by a sense of straitsness in the chest, and with a cough which seems to arise from some irritation felt at the glottis. This cough is generally at first dry and painful, occasioning pains about the chest, and more especially in the breast; sometimes, together with these symptoms, pains resembling those of the rheumatism are felt in several parts of the body, particularly about the neck and head. With all these symptoms, the appetite is impaired, some thirst arises, and a feverish lassitude is felt all over the body. These symptoms mark the height and violence of the disease; but commonly it does not continue long. By degrees the cough becomes attended with a more copious excretion of mucus; which is at first thin, but gradually becoming thicker, is brought up with less frequent and less laborious coughing. The hoarseness and soreness of the trachea are also relieved or removed; and the febrile symptoms abating, the expectoration becomes again less, and the cough less frequent, till at length they cease altogether.

Such is generally the course of this disease, neither tedious nor dangerous; but it is sometimes in both respects otherwise. The body affected with catarrh seems to be more than usually liable to be affected by cold air; and if the body affected with catarrh be ex-

posed to cold, the disease, which seemed to be yielding, is often brought back with greater violence than before, and is rendered not only more tedious than otherwise it would be, but also more dangerous by the supervening of other diseases. Some degree of the cynanche tonsillarum often accompanies the catarrh; and when this is aggravated by a fresh application of cold, the cynanche also becomes more violent and dangerous from the cough, which is present at the same time. When a catarrh has been occasioned by a violent cause, when it has been aggravated by improper management, and especially when it has been rendered more violent by fresh and repeated applications of cold, it often passes into a pneumonic inflammation, attended with the utmost danger.

Unless, however, such accidents as those happen, a catarrh, in found persons not far advanced in life, is always a slight and safe disease; but, in persons of a phthisical disposition, a catarrh may readily produce a hæmoptysis, or perhaps form tubercles in the lungs; and, more certainly in persons who have tubercles already formed in the lungs, an accidental catarrh may occasion the inflammation of these tubercles, and in consequence produce a phthisis pulmonalis.

In elderly persons, a catarrh sometimes proves a dangerous disease. Many persons, as they advance in life, and especially after they have arrived at old age, have the natural mucus of the lungs poured out in greater quantity, and requiring a frequent expectoration. If, therefore, a catarrh happen to such persons, and increase the afflux of fluids to the lungs, with some degree of inflammation, it may produce the peripneumonia notha, which in such cases is very often fatal.

*Causes, &c.* The proximate cause of catarrh seems to be an increased afflux of fluids to the mucous membrane of the nose, fauces, and bronchiæ, along with some degree of inflammation affecting the same. The latter circumstance is confirmed by this, that, in the case of catarrh, the blood drawn from a vein commonly exhibits the same inflammatory crust which appears in the case of phlegmasia. The remote cause of catarrh is most commonly cold applied to the body. This application of cold producing catarrh is generally evident and observed; and Dr Cullen is of opinion that it would always be so, were men acquainted with and attentive to the circumstances which determine cold to act upon the body.

The application of cold which occasions a catarrh, probably operates by stopping the perspiration usually made by the skin, and which is therefore determined to the mucous membrane of the parts above-mentioned. As a part of the weight which the body daily loses by insensible evacuation, is owing to an exhalation from the lungs, there is probably a connection between this exhalation and the cutaneous respiration, so that the one may be increased according as the other is diminished; and therefore we may understand how the diminution of cutaneous perspiration, by the application of cold, may increase the afflux of fluids to the lungs, and thereby produce a catarrh.

Dr Cullen observes that there are some observations of Dr James Keil which may render this matter doubtful; but says there is a fallacy in those observations. The evident effects of cold in producing coryza,

**PRACTICE** coryza, leave the matter, in general, without doubt; and there are several other observations which shew a connection between the lungs and the surface of the body.

Whether from the suppression of perspiration, a catarrh be produced merely by an increased afflux of fluids, or whether further the matter of perspiration be at the same time determined to the mucous glands, and there excites a particular irritation, may be uncertain; but our author thinks the latter supposition is most probable.

Although, in the case of a common catarrh, which is in many instances sporadic, it may be doubtful whether any morbid matter be applied to the mucous glands; we are, however, certain that the symptoms of a catarrh do frequently depend upon such a matter being applied to these glands, as appears from the case of measles, chincoch, and especially from the frequent occurrence of contagious and epidemical catarrh.

The phenomena of contagious catarrhs have been much the same with those of the others; and the disease has always been particularly remarkable for this, that it has been the most widely and generally spreading epidemic known. It has seldom appeared in any one country of Europe, without appearing successively in every different part of it; and, in some instances, it has been also transferred to America, and has been spread there in like manner, so far as we have had opportunities of being informed.

The catarrh from contagion appears with nearly the same symptoms as those above-mentioned. It seems often to come on in consequence of the application of cold. It comes one with more cold shivering than the catarrh arising from cold alone; and the former does also not only sooner shew febrile symptoms, but to a more considerable degree. Accordingly, it more speedily runs its course, which is commonly finished in a few days. It sometimes ends by a spontaneous sweat; and this, in some persons, produces a miliary eruption. It is, however, the febrile state of this disease especially, that is finished in a few days; for the cough and other catarrhal symptoms do frequently continue longer, and often when they appear to be going off they are renewed by any fresh application of cold.

**Prognosis.** Considering the number of persons who are affected with catarrh, of either the one species or the other, and escape from it quickly without any hurt, it may be allowed to be a disease very free from danger; but it is not always to be treated as such, for in some persons it is accompanied with pneumonic inflammation. In the phthisical disposed, it often accelerates the coming on of phthisis; and in elderly persons it often proves fatal in the manner we have explained above.

**Cure.** The cure of catarrh is nearly the same, whether it proceeds from cold or contagion; only in the latter case remedies are commonly more necessary than in the former. In the cases of a moderate disease, it is commonly sufficient to avoid cold, or to abstain from animal-food for some days, or perhaps for the same time to lie a-bed, and, by taking frequently some mild and diluent drink, a little warmed, to promote a very gentle sweat, and after this to take care

to return very gradually only to the use of the free air. When the disease is more violent, not only the antiphlogistic regimen, exactly observed, but various remedies also, become necessary. To take off the phlogistic diathesis, which always attends this disease, blood-letting, more or less, according as the symptoms shall require, is the proper remedy. After blood-letting for restoring the determination of the fluids to the surface of the body, and at the same time for expediting the secretion of mucus in the lungs, which may take off the inflammation of its membrane, vomiting is the most effectual means. For the last-mentioned purpose, it has been supposed that squills, gum-ammoniac, the volatile alkali, and some other medicines, might be useful; but their efficacy has never been found considerable: and if squills have ever been very useful, it seems to have been rather by their emetic than by their expectorant powers. When the inflammatory affections of the lungs seem to be considerable, it is proper, besides blood-letting, to apply blisters to the back or sides.

As a cough is often the most troublesome circumstance of this disease, so demulcents may be employed to alleviate it. But after the inflammatory symptoms are much abated, if the cough still remains, opiates afford the most effectual means of relieving it; and, in the circumstances just now mentioned, they may be very safely employed. After the inflammatory and febrile states of this disease are very much gone, the most effectual means of discussing all remains of the catarrhal affection, is by some exercise of gestation diligently employed.

Besides the remedies above-mentioned, Mr Mudge, in a treatise on this disease, recommends the steam of warm water as a most efficacious and safe remedy for a catarrh, and which indeed he seems to consider as little less than *infallible*. The method of breathing in these steams is described under the word **INHALE**; but he gives a caution to people in health, who may accidentally see his machine, not to make the experiment of breathing through cold water with it, or they will be almost certain of catching a severe cold with it. His directions for those troubled with the catarrh are as follow:

“ In the evening, a little before bed-time, the patient, if of adult age, is to take three drachms, or as many tea-spoonfuls, of elixir paretoricum, in a glass of water: if the subject is younger, for instance, under five years old, one tea-spoonful; or within that and ten years, two. [Each tea-spoonful contains somewhat less than one quarter of a grain of opium.] About three quarters of an hour after, the patient should go to bed, and, being covered warm, the inhaler three parts filled with water nearly boiling, (which, from the coldness of the metal, and the time it ordinarily takes before it is used by the patient, will be of a proper degree of warmth,) and being wrapped up in a napkin, but so that the valve in the cover is not obstructed by it, is to be placed at the arm-pit, and the bed-clothes being drawn up and over it close to the throat, the tube is to be applied to the mouth, and the patient should inspire and expire through it about twenty minutes or half an hour.

“ It is very evident, as the whole act of respiration



PRACTICE is performed through the machine, that in inspiration the lungs will be filled with air which will be hot, and loaded with vapour, by passing through the body of water; and in expiration, all that was contained in the lungs will, by mixing with the steam on the surface of the water, be forced thro' the valve in the cover, and settle on the surface of the body under the bed-cloaths.

"The great use of this particular construction of the inhaler is this. First, as there is no necessity, at the end of every inspiration, to remove the tube from the mouth, in order to expire from the lungs the vapour which had been received into them, this machine may therefore be used with as much ease by children as older people. And, secondly, as a feverish habit frequently accompanies the disorder, the valve in that respect also is of the utmost importance: for a sweat, or at least a free perspiration, not only relieves the patient from the restless anxiety of a hot, dry, and sometimes parched skin, but is also, of all others, the most eligible evacuation for removing the fever; and it will be generally found, that, after the inhaler so constructed hath been used a few minutes, the warm vapour under the cloaths will, by settling upon the trunk, produce a sweat, which will gradually extend itself to the legs and feet.

"In a catarrhus fever, or any feverish habit attending this cough, it would be proper to take a draught of warm thin whey a few minutes before the inhaler is used; and after the process is over, the sweat which it has produced may be continued by occasional small draughts of weak warm whey or barley-water. The sweating is by no means so necessary to the cure of the catarrhus cough, as that the success of the inhaler against that complaint at all depends upon it; yet I cannot help once more remarking, that when this disorder happens to be accompanied with a feverish habit, the advantages of this particular construction will be very important.

"After this respiratory process is over, the patient usually passes the night without the least interruption from the cough, and feels no farther molestation from it than once or twice in the morning to throw off the trifling leakage which, unperceived, had dripped into the bronchie and vessels during the night; the thinner parts of which being evaporated, what remains is soon got rid of with a very gentle effort.

"I cannot, however, take leave of this part of my subject, without pointedly observing, that if the patient means not to be disappointed by my assurances or his own expectations, it is essentially necessary that the following remarks, with regard to the time and manner of using this process, should be strictly attended to.

"First, That as tender valetudinary people are but too well acquainted with the first notices of the disorder, the remedy must, or ought to be, used the same evening; which will, in an ordinary seizure, be attended with an immediate cure; but if the soreness of the respiratory organs, or the petulance of the cough, shew the cold which has been contracted to have been very severe, the inhaler, without the opiate, should be again repeated for the same time the next morning.

"Secondly, if the use of the inhaler, &c. is delayed till the second night, it will be always right

to repeat it again the next morning without the opiate, but with it if the seizure has been violent.

"And, lastly, if the cough is of some days standing, it will be always necessary to employ both parts of the process at night and the succeeding morning, as the first simple inflammatory mischief is now most probably aggravated by an additional one of a chronic tendency.

"But if, through the want of a timely application, or a total neglect of this or any other remedy, the cough should continue to harass the patient, it is, particularly in delicate and tender constitutions, of the utmost consequence to attempt the removal of it as soon as possible, before any floating acrimony in the constitution (from the perpetual irritation) receives an habitual determination to an organ so essential to life as the lungs.

"If the patient expectorates with ease and freedom a thick and well-digested inoffensive phlegm, there is generally but little doubt of his spitting off the disorder, with common care, in a few days; and till that is accomplished, a proper dose of elixir pareticorum for a few successive nights will be found very useful in suppressing the fatiguing irritation and ineffectual cough, occasioned by a matter which, dripping in the early state of the disease into the bronchie during the night, is commonly at that time too thin to be discharged by those convulsive efforts.

"If, however, notwithstanding a free and copious expectoration, the cough should still continue, and the discharge, instead of removing the complaint, should itself, by becoming a disease, be a greater expence than the constitution can well support, it is possible that a tender patient may spit off his life through a weak relaxed pair of lungs, without the least appearance of purulence, or any suspicion of suppuration. In those circumstances, besides, as was mentioned before, increasing the general perspiration by the salutary friction of a flannel waistcoat, change of situation, and more especially long journeys on horseback, conducted as much as possible through a thin, sharp, dry air, will seldom fail of removing the complaint.

"But, on the contrary, if the cough should, at the same time that it is petulant and fatiguing to the breast, continue dry, husky, and without expectoration; provided there is reason to hope that no tubercles are forming, or yet actually formed, there is not perhaps a more efficacious remedy for it than half a drachm of gum ammoniacum, with 18 or 20 drops of landanum, made into pills, and taken at bed-time, and occasionally repeated. This excellent remedy Sir John Pringle did me the honour to communicate to me; and I have accordingly found it, in a great many instances, amazingly successful, and generally very expeditiously so; for it seldom fails to produce an expectoration, and to abate the distressing fatigue of the cough. In those circumstances I have likewise found the common remedy of  $\frac{3}{4}$ s of  $\text{ʒij}$  of *bals. sulph. anisat.* taken twice a-day, in a little powdered sugar or any other vehicle, a very efficacious one. I have also, many times, known a salutary revulsion made from the lungs by the simple application of a large plaster, about five or six inches diameter, of *pix Burgund.* between the shoulders; for the perspirable matter, which is locked up under it, becomes so sharp and acrid, that in a few days

days it seldom fails to produce a very considerable itching, some little tendency to inflammation, and very frequently a great number of boils. This application should be continued (the plaster being occasionally changed), for three weeks or a month, or longer, if the complaint is not so soon removed.

“ And here I cannot help observing, that, though seemingly a trifling, it is however by no means a useless caution to the tender patient, not to expose his shoulders in bed, and during the night, to the cold; but when he lies down to take care they are kept warm, by drawing the bed-cloaths up close to his back and neck.

“ If, however, notwithstanding these and other means, the cough, continuing dry or unattended with a proper expectoration, should persevere in harrassing the patient; if, at last, it should produce, together with a forenoon, shooting pains through the breast and between the shoulders, attended also with shortness of the breath; and if, added to this, flushes of the cheeks after meals, scalding in the hands and feet, and other symptoms of a hectic, should accompany the disorder; there is certainly no time to be lost, as there is the greatest reason to apprehend that some acrimony in the habit is determined to the tender substance of the lungs, and that consequently tubercular suppurations will follow. In this critical and dangerous situation, I think I can venture to say from long experience, that, accompanied with change of air and occasional bleedings, the patient will find his greatest security in a drain from a large scapular issue, assisted by a diet of asses milk and vegetables.”

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XCV. DYSENTERIA, THE DYSENTERY. GENUS XLIII.

Dysentery, *Sauv.* gen. 248. *Lin.* 191. *Vog.* 107. *Sag.* 183. *Hoffm.* III. 151. *Juncq.* 76.

*Description.* The dysentery is a disease in which the patient has frequent stools, accompanied with much griping, and followed by a tenefmus. The stools, though frequent, are generally in small quantity; and the matter voided is chiefly mucus, sometimes mixed with blood. At the same time, the natural fæces seldom appear; and, when they do, it is generally in a compact and hardened form.—This disease occurs especially in summer and autumn, at the same time with autumnal, intermittent, and remittent fevers; and with these it is often complicated. It comes on sometimes with cold shiverings, and other symptoms of pyrexia; but more commonly the symptoms of the topical affection appear first. The belly is cosive; with an unusual flatulence in the bowels. Sometimes, though more rarely, some degree of diarrhoea is the first appearance. In most cases, the disease begins with griping, and a frequent inclination to go to stool. In indulging this, little is voided, but some tenefmus attends it. By degrees the stools become more frequent, the griping more severe, and the tenefmus more considerable. With these symptoms there is a loss of appetite, and frequently sickness, nausea, and vomiting, also affecting the patient. At the same time there is always more or less of pyrexia present. It is sometimes of the remittent kind, and observes a tertian period. Sometimes the pyrexia is

manifestly inflammatory, and very often of a putrid kind. These febrile states continue to accompany the disease during its whole course, especially when it terminates soon in a fatal manner. In other cases, the febrile state almost entirely disappears, while the proper dysenteric symptoms remain for a long time after.—In the course of the disease, whether for a shorter or a longer time, the matter voided by stool is very various. Sometimes it is merely a mucous matter, without any blood, exhibiting that disease which is named by some the *morbus mucosus*, and by others the *dysentery alba*. For the most part, however, the mucus discharged is more or less mixed with blood. This sometimes appears only in streaks amongst the mucus; but at other times is more copious, tinging the whole; and upon some occasions a pure and unmixed blood is voided in considerable quantity. In other respects, the matter voided is variously changed in colour and consistence, and is commonly of a strong and unusually fetid odour. It is probable, that sometimes a genuine pus is voided, and frequently a putrid sanies, proceeding from gangrenous parts. There are very often mixed with the liquid matter, some films of a membranous appearance, and frequently some small masses of a seemingly sebaceous matter. While the stools voiding these various matters are, in many instances, exceedingly frequent, it is seldom that natural fæces appear in them; and when they do appear, it is, as we have said, in the form of scybala, that is, in somewhat hardened, separate balls. When these are voided, whether by the efforts of nature or as solicited by art, they procure a remission of all the symptoms, and more especially of the frequent stools, griping, and tenefmus.

Accompanied with these circumstances, the disease proceeds for a longer or a shorter time. When the pyrexia attending it is of a violent inflammatory kind, and more especially when it is of a very putrid nature, the disease often terminates fatally in a very few days, with all the marks of a supervening gangrene. When the febrile state is more moderate, or disappears altogether, the disease is often protracted for weeks, and even for months; but, even then, after a various duration, it often terminates fatally, and generally in consequence of a return and considerable aggravation of the inflammatory and putrid states. In some cases, the disease ceases spontaneously; the frequency of stools, the griping, and tenefmus, gradually diminishing, while natural stools return. In other cases, the disease, with moderate symptoms, continues long, and ends in a diarrhoea, sometimes accompanied with lienenteric symptoms.

*Causes, &c.* The remote causes of this disease have been variously judged of. It generally arises in summer or autumn, after considerable heats have prevailed for some time, and especially after very warm and at the same time very dry states of the weather; and the disease is much more frequent in warm, than in cooler climates. It happens, therefore, in the same circumstances and seasons which considerably affect the state of the bile in the human body: but the cholera is often without any dysenteric symptoms, and copious discharges of bile have been found to relieve the symptoms of dysentery: so that it is difficult to determine what connection the disease has with the state of the bile.

It has been observed, that the effluvia from very putrid animal-substances readily affect the alimentary canal, and, upon occasion, they certainly produce a diarrhoea; but whether they ever produce a genuine dysentery, is not certain.

The dysentery does often manifestly arise from the application of cold, but the disease is always contagious; and, by the propagation of such contagion, independent of cold, or other exciting causes, it becomes epidemic in camps and other places. It is, therefore, to be doubted if the application of cold ever produces the disease, unless where the specific contagion has been previously received into the body: and, upon the whole, it is probable that a specific contagion is to be considered as always the remote cause of this disease.

Whether this contagion, like many others, be of a permanent nature, and only shews its effects in certain circumstances which render it active, or if it be occasionally produced, we cannot determine. Neither, if the latter supposition be received, can we say by what means it may be generated. As little do we know any thing of its nature, considered in itself; or at most, only this, that, in common with many other contagions, it is very often somewhat of a putrid nature, and capable of inducing a putrescent tendency in the human body. This, however, does not at all explain the peculiar effect of inducing those symptoms which properly and essentially constitute the disease of dysentery. Of these symptoms the proximate cause is still obscure. The common opinion has been, that the disease depends upon an acrid matter thrown upon or somehow generated in the intestines, exciting their peristaltic motion, and thereby producing the frequent stools which occur in this disease. But this supposition cannot be admitted; for, in all the instances known, of acrid substances applied to the intestines, and producing frequent stools, they at the same time produce copious stools, as might be expected from acrid substances applied to any length of the intestines. This, however, is not the case in dysentery, in which the stools, however frequent, are generally in very small quantity, and such as may be supposed to proceed from the lower parts of the rectum only. With respect to the superior portions of the intestines, and particularly those of the colon, it is probable they are under a preternatural and considerable degree of constriction: for, as we have said above, the natural faeces are seldom voided; and when they are, it is in a form which gives reason to suppose they have been long retained in the cells of the colon, and consequently that the colon had been affected with a preternatural constriction. This is confirmed by almost all the dissections which have been made of the bodies of dysenteric patients; in which, when gangrene had not entirely destroyed the texture and form of the parts, considerable portions of the great guts have been found affected with a very considerable constriction.

The proximate cause of dysentery, or at least the chief part of the proximate cause, seems to consist in a preternatural constriction of the colon, occasioning, at the same time, those spasmodic efforts which are felt in severe gripings, and which efforts, propagated downwards to the rectum, occasion there the frequent mucous stools and tenesmus. But, whether this expla-

nation shall be admitted or not, it will still remain certain, that hardened faeces, retained in the colon, are the cause of the griping, frequent stools, and tenesmus: for the evacuation of these faeces, whether by nature or by art, gives relief from the symptoms mentioned; and it will be more fully and usefully confirmed by this, that the most immediate and successful cure of dysentery is obtained by an early and constant attention to the preventing the constriction, and the frequent stagnation of faeces in the colon.

*Cure.* The most eminent of our late practitioners, and of greatest experience in this disease, seem to be of opinion, that it is to be cured most effectually by purging, assiduously employed. The means may be various: but the most gentle laxatives are usually sufficient; and, as the medicine must be frequently repeated, these are the most safe, the more especially as an inflammatory state so frequently accompanies the disease. Whatever laxatives produce an evacuation of natural faeces, and a consequent remission of the symptoms, will be sufficient to effectuate the cure. But, if the gentle laxatives shall not produce the evacuation now mentioned, somewhat more powerful must be employed; and Dr Cullen hath found nothing more proper or convenient than tartar emetic, given in small doses, and at such intervals as may determine their operation to be chiefly by stool. Rhubarb, so frequently employed, is, in several respects, amongst the most unfit purgatives.

Vomiting has been held a principal remedy in this disease; and may be usefully employed in the beginning of the disease, with a view to both the state of the stomach and of the fever: but it is not necessary to repeat it often; and, unless the emetics employed operate also by stool, they are of little service. Ipecacuanha is by no means a specific; and it proves only useful when so managed as to operate chiefly by stool.

For relieving the constriction of the colon, and evacuating the retained faeces, glysters may sometimes be useful; but they are seldom so effectual as laxatives, given by the mouth; and acrid glysters, if they be not effectual in evacuating the colon, may prove hurtful by stimulating the rectum too much.

The frequent and severe griping attending this disease, leads almost necessarily to the use of opiates; and they are very effectual for the purpose of relieving from the gripes: but, by occasioning an interruption of the action of the small guts, they favour the constriction of the colon, and thereby aggravate the disease; and if, at the same time, the use of them supercede in any measure the employing purgatives, it is doing much mischief; and the neglect of purging seems to be the only thing which renders the use of opiates very necessary.

When the gripes are both frequent and severe, they may sometimes be relieved by the employment of fennicupium, or by a fomentation of the abdomen continued for some time. In the same case, the pains may be relieved, and the constriction of the colon may be taken off, by blisters applied to the lower belly.

At the beginning of this disease, when the fever is any way considerable, blood-letting, in patients of tolerable vigour, may be proper and necessary; and, when



when the pulse is full and hard, with other symptoms of an inflammatory disposition, blood-letting ought to be repeated. But, as the fever attending dysentery is often of a putrid kind, or does, in the course of the disease, become soon of that nature, blood-letting must be cautiously employed.

From our account of the nature of this disease, it will be sufficiently obvious, that the use of astringents in the beginning of it must be absolutely pernicious. Whether an acrid matter be the original cause of the dysentery may be uncertain; but, from the indigestion, and the stagnation of fluids, which attend the disease, we may suppose that some acrid matters are constantly present in the stomach and intestines, and therefore that demulcents may be always usefully employed. At the same time, from this consideration that mild oily matters thrown into the intestines in considerable quantity always prove laxative, Dr Cullen is of opinion that the oleaginous demulcents are the most useful.

As this disease is so often of an inflammatory or of a putrid nature, it is evident that the diet employed in it should be vegetable and astringent. Milk, in its entire state, is of doubtful quality in many cases; but some portion of the cream is often allowable, and whey is always proper.—In the first stages of the disease, the sweet and subacid fruits are allowable, and even proper. It is in the more advanced stages only that any morbid acidity seems to prevail in the stomach, and to require some reserve in the use of astringents. At the beginning of the disease, absorbents seem to be superfluous; and, by their astringent and leptic powers, they may be hurtful.

When this disease is complicated with an intermittent, and is protracted from that circumstance chiefly, it is to be treated as an intermittent, by administering the Peruvian bark, which in the earlier periods of the disease is hardly to be admitted.

## CLASS II. NEUROSES.

### ORDER I. COMATA.

COMATA, *Sauv.* Clafs VI. Ord. II. *Sag.* Clafs IX. Ord. V.

Soporosi, *Lin.* Clafs VI. Ord. II.

Adynamiæ, *Vog.* Clafs VI.

Nervorum resolutiones, *Hoffm.* III. 194.

Affectus soporosi, *Hoffm.* III. 209.

Motuum vitalium defectus, *Junck.* 114.

### GENUS XLIV. APOPLEXY.

Apoplexia, *Sauv.* gen. 182. *Lin.* 101. *Vog.* 229. *Boerb.* 1007. *Junck.* 117. *Sag.* gen. 288. *Wepfer.* Hist. apoplepticorum.

Carus, *Sauv.* gen. 181. *Lin.* 100. *Vog.* 231. *Boerb.* 1045. *Sag.* gen. 287.

Cataphora, *Sauv.* gen. 180. *Lin.* 99. *Vog.* 232. *Boerb.* 1048. *Sag.* gen. 286.

Coma, *Vog.* 232. *Boerb.* 1048.

Hæmorrhagia cerebri, *Hoffm.* II. 240.

To this genus also Dr Cullen reckons the following diseases to belong.

Cataleptis, *Sauv.* gen. 176. *Lin.* 129. *Vog.* 230.

*Sag.* gen. 281. *Boerb.* 1036. *Junck.* 44. Affectus cerebri spasmoticus-eccliticus, *Hoffm.* III.

44. Ecclasis, *Sauv.* gen. 177. *Vog.* 333. *Sag.* gen. 283.

The following he reckons symptomatic.

Typhomania, *Sauv.* gen. 178. *Lin.* 97. *Vog.* 23.

*Sag.* gen. 284.

Lethargus, *Sauv.* gen. 179. *Lin.* 98. *Vog.* 22.

*Sag.* gen. 285.

### XCVI. The Sanguineous APOPLEXY. Sp. I. 368

*Description.* In this disease the patients fall suddenly down, and are deprived of all sense and voluntary motion, but without convulsions. A giddiness of the head, noise in the ears, convulsions before the eyes, and redness of the face, usually precede. The distinguishing symptom of the disease is a deep sleep, attended with violent snoring; if any thing is put into the mouth, it is returned through the nose; nor can any thing be swallowed without shutting the nostrils; and even when this is done, the person is in the utmost danger of suffocation. Sometimes apopleptic patients will open their eyes after having taken a large dose of an emetic; but if they shew no sign of sense, there is not the least hope of their recovery. Sometimes the apoplexy terminates in an hemiplegia; in which case it comes on with a distortion of the mouth towards the found side, a drawing of the tongue the same way, and flammering of the speech. Dissections sometimes shew a rupture of some vessels of the meninges, or of the brain itself; though sometimes, if we may believe Dr Willis, no defect is to be observed either in the cerebrum or cerebellum.

*Causes, &c.* The general cause of a sanguineous apoplexy is a plethoric habit of body, with a determination to the head. The disease therefore may be brought on by whatever violently urges on the circulation of the blood; such as sorfeits, intoxication, violent passions of the mind, immoderate exercise, &c. It takes place, however, for the most part, when the venous plethora hath subsisted for a considerable time in the system. For that reason it commonly does not attack people till past the age of 60; and that whether the patients are corpulent and have a short neck, or whether they are of a lean habit of body. Till people are past the age of childhood, apoplexy never happens.

*Prognosis.* This disease very often kills at its first attack; and few survive a repetition of the fit; so that those who make mention of people who have survived several attacks of the apoplexy, have probably mistaken the epilepsy for it. In no disease is the prognosis more fatal; since those who seem to be recovering from a fit, are frequently and suddenly carried off by its return, without either warning of its approach, or possibility of preventing it. The good signs are when the disease apparently wears off, and the patient evidently begins to recover; the bad ones are when all the symptoms continue and increase.

*Cure.* This is to be attempted, in the first place, by large and repeated bleedings; after which, the same remedies are to be used as in the serous apoplexy,

PRACTICE plexy, aftermentioned. The body is to be kept in a somewhat erect posture, and the head kept up.

369 XC VII. The Serous APOPLEXY. Sp. II.

Apoplexia pituitosa, *Sauv.* sp. 7. Apoplexia serosa, *Preyinger*, sp. 4. *Morg.* de causis, &c. IV. LX. Carus a hydrocephalo, *Sauv.* sp. 16. Cataphora hydrocephalica, *Sauv.* sp. 6. Cataphora somnolenta, *Sauv.* sp. 1. Lethargus literatorum, *Sauv.* 7. *Van Swieten* in Aphor. 1010. 2 7 and 3.

*Description.* In this species the pulse is weak, the face pale, and there is a diminution of the natural heat. On dissection, the ventricles of the brain are found to contain a larger quantity of fluid than they ought; the other symptoms are the same as in the former.

*Causæ, &c.* This may arise from any thing which induces a debilitated state of the body, such as depressing passions of the mind, much study, watching, &c. It may also be brought on by a too plentiful use of diluting, acidulated drinks. It doth not, however, follow, that the extravasated serum above-mentioned in the ventricles of the brain is always the cause of the disease, since the animal-humours are very frequently observed to ooze out in plenty through the coats of the containing vessels after death, though no extravasation took place during life.

*Prognosis.* This species is equally fatal with the other; and what hath been said of the prognosis of the sanguineous, may also be said of that of the serous, apoplexy.

*Cure.* In this species venesection can scarcely be admitted: acrid purgatives, emetics, and stimulating clysters, are recommended to carry off the superabundant serum; but in bodies already debilitated, they may perhaps be liable to the same exceptions with venesection itself. Volatile salts, cephalic elixirs, and cordials, are also preferred; and in case of a hemiplegia supervening, the cure is to be attempted by aperient puffs, cathartics, and sudorifics; gentle exercise, as riding in a carriage; with such stimulating medicines as are proper in a palsy. See below.

370 XC VIII. Hydrocephalic APOPLEXY, or Dropsy of the Brain. Sp. III.

Hydrocephalus interior, *Sauv.* sp. 1. Hydrocephalus internus, *Whytt's* works, pag. 725. London Med. Obs. vol. iv. art. 3, 6, and 25. *Gaudelius* de hydrocephalo, apud *Sandisfort* Thesaur. vol. ii. Hydrocephalus acutus, *Quin.* *Diff.* de hydrocephalo, 1779. Athenia a hydrocephalo, *Sauv.* sp. 3.

*History and description.* This disease has been accurately treated within these few years by several eminent physicians, particularly the late Dr Whytt, Dr Fothergill, and Dr Watson; who concur in opinion with respect to the seat of the complaint, the most of its symptoms, and its general fatality. Out of twenty patients that had fallen under Dr Whytt's observation, he candidly owns that he had been so fortunate as to cure only one who laboured under the characteristic symptoms of the hydrocephalus; and he su-

spects that those who imagine they have been more successful, had mistaken another distemper for this. It is by all supposed to consist in a dropsey of the ventricles of the brain; and this opinion is fully established by dissections. It is observed to happen more commonly to healthy, active, lively children; than to those of a different disposition.

Dr Whytt supposes that the commencement of this disease is obscure; that it is generally some months in forming; and that, after some obvious urgent symptoms render assistance necessary, it continues some weeks before its fatal termination. This, in general, differs from what has hitherto been observed by Dr Fothergill; the latter informing us, that he has seen children, who, from all appearance, were healthy and active, seized with this distemper, and carried off in about fourteen days. He has seldom been able to trace the commencement of it above three weeks.

Though the hydrocephalus be most incident to children, it has been sometimes observed in adults; as appears from a case related by Dr Huck, and from some others.

Those who are seized with this distemper, usually complain first of a pain in some part below the head; most commonly about the nape of the neck and shoulders; often in the legs; and sometimes, but more rarely, in the arms. The pain is not uniformly acute, nor always fixed to one place; and sometimes does not affect the limbs. In the latter case, the head and stomach have been found to be most disordered; so that when the pain occupied the limbs, the sickness or head-ach was less considerable; and when the head became the seat of the complaint, the pain in the limbs was seldom or never mentioned. Some had very violent sicknesses and violent head-achs, alternately. From being perfectly well and sportive, some were in a few hours seized with those pains in the limbs, or with sickness, or head-ach, in a slight degree, commonly after dinner; but some were observed to droop a few days before they complained of any local indisposition. In this manner they continued three, four, or five days, more or less, as the children were healthy and vigorous. They then commonly complain of an acute deep-seated pain in the head, extending across the forehead from temple to temple; of which, and a sickness, they alternately complain in short and affecting exclamations; doing a little in the intervals, breathing irregularly, and sighing much while awake. Sometimes their sighs, for the space of a few minutes, are incessant.

As the disease advances, the pulse becomes slower and irregular, the strokes being made both with unequal force and in unequal times, till within a day or two of the fatal termination of the disorder, when it becomes exceeding quick; the breathing being at the same time deep, irregular, and laborious. After the first access, which is often attended with feverish heats, especially towards evening, the heat of the body is for the most part temperate, till at last it keeps pace with the increasing quickness of the pulse. The head and præcordia are always hot from the first attack. The sleeps are short and disturbed, sometimes interrupted by watchfulness; besides which there are startings, the pupils of the eyes are much dilated, and during sleep great part of the white of them is

exposed to view. The patients are averse to light, unwilling to be disturbed for any purpose, and can bear no posture but that of lying horizontally. One or both hands are most commonly about their heads. The urine and stools come away insensibly. At length the eyelids become paralytic, great heat accompanied with sweat overpreads the whole body, respiration is rendered totally suppurative, the pulse increase in its trembling undulations beyond the possibility of counting, till the vital motions entirely cease; and sometimes a spasm concludes the scene.

Many of the symptoms above enumerated are so common to worm-cases, teething, and other irritating causes, that it is difficult to fix upon any which particularly characterize this disease. The most peculiar seem to be the pains in the limbs, with sickness and incessant head-ach; which, though frequent in other diseases of children, are neither so uniformly nor so constantly attendant as in this. Another circumstance observed to be familiar, if not peculiar to this distemper, is, that the patients are not only colic, but it is likewise with the greatest difficulty that stools can be procured. These are generally of a very dark greenish colour, with an oiliness or a glassy bile, rather than the slime which accompanies worms; and they are, for the most part, extremely offensive. No positive conclusion can be drawn from the appearance of the urine; it being various, in different subjects, both in its colour and contents, according to the quantity of liquor they drink, and the time between the discharges of the urine. From their unwillingness to be moved, they often retain their water twelve or fifteen hours, and sometimes longer. In complaints arising from worms, and in dentition, spasms are more frequent than in this disorder. Children subject to fits are sometimes seized with them a few days before they die. Sometimes these continue twenty-four hours incessantly, and till they expire.

*Causes.* The causes of internal hydrocephalus are very much unknown, though some suppose it to proceed from a rupture of some of the lymphatic vessels of the brain. In many cases it seems to be hereditary; and as it attacks children rather than adults, it would seem to be occasioned by a laxity, rather than a rupture, of the vessels.

*Prognosis and Cure.* Till very lately this disorder was reckoned totally incurable; but now it is found that mercury, if applied in time, will remove every symptom. This remedy was first thought of by Dr Percival of Manchester, afterwards by Dr Dobson of Liverpool, and its efficacy is now ascertained beyond a doubt. The method of exhibiting this medicine in order to effect a cure, as well as the inutilty of other medicines, will fully appear from the following cases.

#### CASE I. By Dr PERCIVAL.

" September 4. 1777. Master H. a child at the breast, aged seven months, has laboured about a fortnight under a slow irregular fever. His eyes have been now and then a little distorted; he has been affected with some degree of stupor; his gums have been inflamed and tender; and his mouth uncommonly dry. No tooth has yet made its appearance. An emetic has been administered; a blister applied to his back;

and his belly has been kept soluble by repeated small doses of magnesia. During the action of the blister, he was thought to be much better, but he soon relapsed into his former state.

" About three o'clock this morning, he was convulsed: at nine, I saw him; and, from his countenance, instantly suspected a dropsey of the brain. The symptoms confirmed my apprehensions. His skin was hot; yet his pulse beat only 78 strokes in a minute, which were irregular. The pupils of his eyes were considerably, but unequally, dilated; nor did they contract much when a lighted candle was suddenly held before them. He often squinted, especially with the right eye, and seemed to take no notice of any objects around him. He refused the breast, and seldom swallowed till the lips and tongue had been stimulated with a feather. During several days past, he had been frequently observed to rub the end of his nose when his hand was at liberty; and, notwithstanding his stupor, he had been uncommonly watchful. I examined his head, and found a manifest tumour of the bregma, which had never before been noticed. Convinced by all these circumstances that the child laboured under the hydrocephalus internus, and that he was now in the second stage of that disorder, I directed ten grains of the *unguentum mercuriale mitius* to be rubbed into his thighs every three hours, till the mouth should be affected, and a tea-spoonful of the following mixture to be given whenever the convulsive symptoms recurred.

*R. Salis ammon. vol. ʒi. Succ. Lemon. ʒvi. Mosch. opt. mucilaginis gum. Arabic. solut. gr. vi. Sacch. alb. q. l. ad gratiam. M.*

" Small blisters were applied on each side of the head, just below the bregma; and a folded rag, frequently moistened with brandy, was laid upon the tumour, to promote absorption. An emetic had been given early in the morning, by which a large quantity of bile was discharged; and a vesicatory had also been applied to his leg.

" September 5. nine o'clock. The child has had frequent convulsions in the night; his right eye is much distorted; and it has been remarked, that he seldom moves the right-hand. The pulse beat 120 strokes in a minute. Two scruples of the mercurial ointment have been used, and he has taken five grains of musk. A large discharge of serum has been produced by the blisters. Five o'clock, P. M. the tumour of the head is sensibly diminished; the child's mouth is now moist, and often filled with saliva; and his tongue appears to be swollen. His pulse beat 146 strokes in a minute. I directed another blister to be applied to the head.

" September 6. His convulsions have been much lighter; his eye is frequently distorted; and the pupils of each are more contracted. The stupor is considerably abated; the child seems to take some notice, distinguishes taste, and swallows freely. The musk has been continued; and half a dram more of the mercurial ointment has been consumed. A clyster was injected last night, but ineffectually: I therefore prescribed a grain of jalap, mixed with an equal quantity of sugar, to be given every three hours, till a motion to stool succeeded.

" September 7. The child has passed the night  
more



more comfortably, but not free from convulsions. His head has sweated profusely, and the blisters have run much. The tumour of the bregma is considerably reduced. The jalap operated gently last night, and the mercurial unction has been twice repeated. There is an evident mitigation of all the symptoms.

" September 8. About eleven o'clock last night, the child was attacked with severe convulsions, which recurred frequently till six o'clock this morning. He has had a short sleep, and is now composed. His pulse beats 140 strokes in a minute; his heat is moderate; and his skin soft and perspirable. The mercurial ointment has been again used; but, tho' his gums and tongue are sore and very moist, his breath is not offensive. I directed a grain of calomel to be immediately given, to procure a stool; and a blister to be applied to the occiput.

" September 10. He has passed two nights almost entirely free from convulsions. Ten grains of the mercurial ointment have been again rubbed into his thighs. The dose of calomel occasioned three very offensive stools; and directions are given to repeat it, as he is again coactive. The blister applied to the occiput, like the others, has produced a very copious discharge. The tumour of the head is now scarcely perceptible. Pulse 120.

" September 12. At 12 o'clock last night, the convulsions recurred with greater violence than ever, and still continue. Two teeth have almost protruded through the upper, and the same number through the lower gum. Pulse 160, tremulous and irregular. I directed that the child should be immediately put into a warm bath, and that the following remedies should be administered.

R. *Infus. rad. valer. fortissimi* ℥ii.

*Aloë* ℥ss. *electæ* ℥ss. M. f. *Enema statim injiciendum.*

R. *Tinct. valer. volat.* ℥ii. *Dentur guttæ* ℥iii. *Subinde e cochleari parvulo infusi rad. valer. sylv. sub forma theæ parati.*

" The convulsions continued, but with less violence; and the child expired about one o'clock in the afternoon."

On this case the Doctor makes the following observations.

" The deplorable case which I have related appears to have originated from the irregular action produced in the system by dentition, and from the want of a due secretion of saliva in the mouth, by which the fluid discharges were probably increased in the ventricles of the brain. That these discharges were diminished, and that the extravasated water was absorbed, by the powerful action of the mercury, may be presumed from the mitigation of all the symptoms which succeeded the salivation. And I am inclined to believe, that the convulsions under which the child expired were more owing to the irritation of his gums by the protrusion of four teeth, than to any remaining water in the brain; for the tumour of the head had entirely disappeared, and after death there was a manifest depression of the bregma. During the space of a week, 110 grains of the unguentum mercuriale mitius, which contains about 22 grains of mercury, was consumed, in the usual way of friction. Perhaps half of this quantity might be absorbed, and

carried into the course of circulation; to which may be added, part of the two grains of the calomel administered internally. The symptoms of the salivation were not violent; and the effects of the mercury did not appear formidable or alarming, even to the parents of the child, who were apprised of the nature of the disorder, and fully approved of the trial of this new method of treating it."

#### CASE II. By Dr DOBSON.

" On the 13th of February 1775, I was called to the only son of Mr C. a gentleman of this place: the child was between three and four years of age; had been indisposed about eight days; and had frequently complained of pain in his head and weariness, and pains in his limbs; had been sick by fits, and sometimes vomited; was feverish, and could not bear the light.

" I was much alarmed on hearing this account, as the *hydrocephalus internus* had already proved fatal to three children of this family, who had all been under my care. And that this had been the disease was evident, both from the symptoms and the appearances on dissection. But my alarm was much farther increased on examining the little patient. The pulse I found very frequent and irregular. The head hot, the cheeks flushed, the pupils dilated, and a great degree of strabismus. There remained no doubt with respect to the nature of the disease.

" An emetic, some calomel powders, and a purgative, had been administered, without affording any relief. I directed the pediluvium, and emetic tartar to be given in such doses as to excite nausea.

" February 14th. The symptoms the same, with frequent startings, disturbed sleep, and tossing from side to side on the pillow. A blister was applied between the shoulders, the pediluvium repeated, and the emetic tartar continued.

" 15th. Comatose, restless, and shrieking by fits. The pulse slower than in health, and the eyes insensible even to the impressions of strong light.

" As I had no hope of doing any thing effectual for the recovery of my patient, I paid my visits, prescribed, and gave directions with a foreboding and heavy heart. Anxiously, however, considering the case in different points of view, and fully convinced that it was vain to pursue the usual line of practice, it occurred to me, that mercurials, so far urged as to enter the course of circulation, and affect the salivary glands, might possibly reach the system of absorbents in the ventricles of the brain, and thus remove the extravasated fluid.

" The short continuance of the disease, and the apparent strength of my patient, were favourable to the trial of this method. No time, however, was to be lost. The parents were consulted, and readily gave their sanction to the proposal; for they were convinced, that, unless some powerful steps were taken, this their only son must be numbered with those of their children who had already fallen a sacrifice to the disease.

" The mercurial course, therefore, was commenced, and urged on with caution and expedition. In 48 hours the breath began to be offensive; the gums were reddish and swelled; and the symptoms of the disease, so far as could be distinguished, were somewhat abated. In 48 hours more the pyralism came on, and the disease

was evidently declining. Between the 15th and 22d he took 20 grains of calomel, and one drachm of the strongest mercurial ointment was likewise rubbed in well upon the legs and thighs. The dose of calomel was one grain, mixed with a little sugar, and repeated at such intervals as the circumstances of the case pointed out.

"After the 22d no more mercurials were administered; a moderate pyralism continued for five or six days, then gradually ceased, and the disease was entirely removed. The bark was then given, as the best tonic remedy after the mercurial course, and as the best preservative against a relapse. The strabismus I observed was the last symptom which disappeared.

"From the 15th, no other medicines were used except mercurials. The three sisters of the above patient, who all died of this disease, were treated with blisters; and to one of them they were applied in succession to the head, behind the ears, and between the shoulders."

#### CASE III. By Dr PERCIVAL.

"ONE of my own children, a girl, aged three years and three months, has lately been a feverer sufferer under this alarming malady. As soon as the characteristic symptoms of the disease clearly manifested themselves, I laid aside all other remedies, convinced, by repeated observation, of their insufficiency; and trusted solely, though with much solicitude, to the internal and external use of mercury. In 48 hours, signs of amendment appeared, and her recovery was perfected in six days. During this space of time, thirteen grains of calomel were administered, and seven scruples of *unguentum mercuriale fortius* carefully rubbed into her legs."

#### CASE IV. By Mr JOHN MACKIE Surgeon in Huntingdon.

JOHN ALGOOD, aged 27, of a thin habit of body, accustomed for four or five years past to work in a tan-yard in a very stooping posture, was attacked in the beginning of May with an irregular intermitting fever, accompanied with much pain in his joints. These complaints continued till about the middle of June, when he was seized with a violent and constant pain in the back-part of his head, attended with great giddiness, noise in his head and ears, dimness of sight, &c. and his fever became more continued. He lay in this state upwards of a month, without receiving any benefit from some medicines which he took during this period.

Mr Mackie was called to him in the middle of July, and found him labouring under the following symptoms: A fixed pain on the right side and back part of his head, which was frequently so acute as to make him quite outrageous, crying out, tearing his hair, beating himself on the head, &c. He had such a giddiness, that, unless strongly held, he could not support himself a moment in an upright posture. He could not bear the light; and, when he did venture to open his eyes, could not see objects distinctly. His pupils were uncommonly dilated; and his right eye seemed drawn outward, and rather contracted in its volume. He complained of a strange palpitating noise in his head and ears; and said, he felt at times as if there was a weight

of water falling from one side of his head to the other. He was, in general, sensible; but, on asking him two or three questions together, he became confused, and, like a person with an oppressed brain, answered with hesitation, quite wide of the question, and often opposite to what he meant. Along with these, he had a hot skin, small quick pulse, thirst, a foul tongue, urine in small quantity and high-coloured; he was emaciated, sick, costive, and sweated much; had often a kind of stupor, but very little sleep. Once in the 24 hours he had generally a remission (of three or four hours continuance) of the febrile symptoms, but of none of the other complaints.

July 16th. Ordered three or four leeches to be applied to each temple immediately; an emetic to be taken in the evening, and a cooling purge to-morrow morning.

17th. In the evening found the leeches had taken away a good deal of blood, and the vomit and purge operated well. No change in the complaints, except that the sickness is a little abated. He screamed greatly on attempting to raise his head from the pillow.

Ordered his head to be shaved, and a sharp blister to be applied all over the occiput, large enough to cover the nape of the neck; also one on the inside of the leg. Internally,—℞. *Nitri puri*, dr. ℥s. *Gum. camphor*, gr. iv. *M. f. pulvis; quarta quaque hora sumendus durante febrili calore.* ℞. *Pulv. cort. Peruvian*, dr. i. *Pulv. rad. valerian*, ℥ss. dr. ℥s. *M. f. pulvis, exhibendus quamprimum remissio apparcat, & repetendus si ultra horas tres pergat.* Thin milk-gruel and barley-water for drink.

July 19th. The blisters have discharged much, and he has taken the medicines punctually; but the fever and other complaints remain as before. Pulse very irregular; pain in the head, and restlessness, extreme.

Left off the camphire; and in its stead added to each nitrous powder, tartar emetic, gr. ʒ. Dressed the blisters with the *unguent. ad vesicatoria*.

21st. Two doses of the bark and valerian were given during the two last remissions of the fever, which were full four hours each; but to-day there appears no kind of amendment. All the symptoms continue much the same. Shrieked out much, and talked incoherently. Has had no stool since he took his physic. Ordered a laxative glyster to be thrown up directly, and the medicines to be continued as on the 19th.

23d. The glyster procured two motions. Has sweated profusely through the last 48 hours. Blisters have run freely. The two last diurnal remissions not quite so distinct. No abatement of the other complaints. The pain, giddiness, stupor, contortion of the eyes, &c. remain in as great a degree as ever. Mr Mackie now left off all other medicines, and ordered ten grains of calomel, made into a bolus with conserve of roses, to be taken at bed-time: at the same time, a dram of the strong mercurial ointment was directed to be rubbed into the ankles; and both to be repeated every night.

25th. Found no alteration. Fever and other symptoms the same. Blisters heal, having been dressed twice with basilicon. The calomel, and mercurial friction, ordered to be continued as on the 23d.

26th. Mr Mackie found him complaining much of being griped. Had two purging stools in the last

24 hours. His gums were a little tender, and his breath beginning to be tainted. In other respects as usual. Left off the calomel, and ordered a double quantity of the mercurial ointment to be rubbed into his thighs every night.

28th. He had had a calmer night than any these two months past. For the first time, he said the pain of his head was abated; he looked more composed; his skin felt cooler; his pulse more full, and not so quick. He complained of his mouth being fore, and his tongue swelled; and had discharged a good deal of saliva in the night. Only one dram of the ointment to be rubbed in, for the two next nights.

30th. He spit about three quarts during the last 48 hours, and complains of much heat in his mouth; but all his other complaints better. Pain in his head almost gone, excepting now and then a shoot. Giddiness much abated. He said he often felt a trickling kind of motion, as of water running along the inside of his temples; but this sensation was without pain. He could sit up in bed, and feed himself; was sensible, and in spirits. Pulse regular, and not above 70 in a minute. He has had a remission of upwards of six hours to-day; ordered the ointment to be left off.

Aug. 1st. Continues to spit freely. Had yesterday a smart return of the fever; which, however, only held him about 12 hours. To-day there is a perfect remission, and he is in every respect greatly mended. Has had some hours good sleep. Complains very little of pain. Got out of bed for the first time; sat up three hours; and could even bear the light without being disturbed by it. Complained of being hungry. Allowed plenty of milk-porridge and small broth.

3d. The spitting keeps up to about a quart in the 24 hours. Found him out of bed to-day, and almost without complaints. He said his head was well; and that he only wanted strength, and to get rid of his fever and poor mouth. The remissions were now almost as long as the paroxysms, being about 12 hours each. Has taken no medicine internally since he left off the calomel, and was coftive. Ordered a dose of rhubarb; and, after its operation, a dram of the bark every four hours during the remissions.

6th. The spitting begins to decline. He has had no fever for the last 24 hours. He sleeps well; and has an appetite, if the foreness of his mouth would let him eat. Headach and giddiness gone; but his pupils still continue much dilated. Ordered him another rhubarb-purge, and the bark to be continued every fix hours.

9th. Has had no fever, or other complaints. Spitting inconsiderable; mouth better; aspect more natural; is able to walk about, and mends daily. Allowed him a more generous and substantial diet, and continued the bark twice a-day for another week.

From this time, he continued to get strength apace; had good nights, good appetite, a perfect freedom from headach and fever; and, on the 23d, went to work, being in every respect quite well, and has continued so ever since.

This patient did not seem to receive the smallest benefit from the blisters, or any thing else, till he took the mercury, which acted like a specific; and the fe-

ver seemed to be altogether symptomatic, as it easily yielded after the other complaints were removed.

# XCIX. APOPLEXY from *Atrabilis*. Sp. IV. 371

Apoplexia atrabiliaria, *Sauv.* sp. 12. *Preysinger*, sp. 6.

This takes place in the last stage of the diffusion of bile through the system, i. e. of the black jaundice, and in some cases the brain hath been found quite tinged brown. It cannot be thought to admit of any cure.

# C. APOPLEXY from *External Violence*. Sp. V. 372

Apoplexia traumatica, *Sauv.* sp. 2.

Carus traumaticus, *Sauv.* sp. 5.

The treatment of this disease, as it arises from some external injury, properly falls under the article SURGERY.

# CI. APOPLEXY from *Poisons*. Sp. VI. 373

Apoplexia temulenta, *Sauv.* sp. 3.

Carus a narcoticis, *Sauv.* sp. 14.

Lethargus a narcoticis, *Sauv.* sp. 3.

Carus a plumbagine, *Sauv.* sp. 10.

Apoplexia mephitica, *Sauv.* sp. 14.

Asphyxia a mephitide, *Sauv.* sp. 9.

Asphyxia a fumo, *Sauv.* sp. 3.

Catalepsia a fumo, *Sauv.* sp. 3.

Asphyxia a fumis, *Sauv.* sp. 2.

Asphyxia a carbone, *Sauv.* sp. 16.

Asphyxia foricarium, *Sauv.* sp. 11.

Asphyxia fideratorum, *Sauv.* sp. 10.

Carus ab infolatione, *Sauv.* sp. 12.

Carus a frigore, *Sauv.* sp. 15.

Lethargus a frigore, *Sauv.* sp. 6.

Asphyxia congelatorum, *Sauv.* sp. 5.

THE poisons which bring on an apoplexy when taken internally are those of the stimulant and sedative kind, as spirituous liquors, opium, and the more virulent kinds of vegetable poisons. The vapours of mercury, or of lead, in great quantity, will sometimes produce a similar effect; though commonly they produce rather a paralysis, and operate slowly. The vapours of charcoal, or fixed air, in any form, breathed in great quantity, also produce an apoplexy, or a state very similar to it; and even cold itself produces a fatal sleep, though without the apoplectic snoring.—To enumerate all the different symptoms which affect the unhappy persons who have swallowed opium, or any of the stronger vegetable poisons, is impossible, as they are scarce to be found the same in any two patients. The state induced by them seems to differ somewhat from that of a true apoplexy; as it is commonly attended with convulsions, but hath the particular distinguishing sign of apoplexy, namely, a very difficult breathing or snoring, more or less violent according to the quantity of poisonous matter swallowed.

Of the poisonous effects of fixed air, Dr Percival gives the following account. "All these noxious vapours, whether arising from burning charcoal, the fermenting grape, the Grotti di Cani, or the cavern of Pymont, operate nearly in the same manner. When accumulated and confined, their effects are often instantaneous; they immediately destroy the action of the



the brain and nerves, and in a moment arrest the vital motions. When more diffused, their effects are slower, but still evidently mark out a direct affection of the nervous system.

Those who are exposed to the vapours of the fermenting grape, are as instantly destroyed as they would be by the strongest electrical shock. A state of insensibility is the immediate effect upon those animals which are thrust into the Grotto di Cani, or the cavern of Pyrmont: the animal is deprived of motion, lies as if dead; and if not quickly returned into the fresh air, is irrecoverable. And if we attend to the histories of those who have suffered from the vapours of burning charcoal, we shall in like manner find, that the brain and moving powers are the parts primarily affected.

A cook who had been accustomed to make use of lighted charcoal more than his business required, and to stand with his head over these fires, complained for a year of very acute pain in the head; and after this, was seized with a paralytic affection of the lower limbs, and a slow fever.

A person was left reading in bed with a pan of charcoal in a corner of the room. On being visited early the next morning, he was found with his eyes shut, his book open and laid on one side, his candle extinguished, and to appearance like one in a deep sleep. Stimulants and cupping-glasses gave no relief; but he was soon recovered by the free access of fresh air.

Four prisoners, in order to make their escape, attempted to destroy the iron work of their windows, by the means of burning charcoal. As soon as they commenced their operations, the fumes of the charcoal being confined by the closeness of the prison, one of them was struck dead; another was found pale, speechless, and without motion; afterwards he spoke incoherently, was seized with a fever, and died. The other two were with great difficulty recovered.

Two boys went to warm themselves in a stove heated with charcoal. In the morning they were found destitute of sense and motion, with countenances as composed as if in a placid sleep. There were some remains of pulse; but they died in a short time.

A fisherman deposited a large quantity of charcoal in a deep cellar. Some time afterwards, his son, a healthy strong man, went down into the cellar with a pan of burning charcoal and a light in his hand. He had scarcely descended to the bottom, when his candle went out. He returned, lighted his candle, and again descended. Soon after, he called aloud for assistance. His mother, brother, and a servant, hastened to give him relief; but none of them returned. Two others of the village shared the same fate. It was then determined to throw large quantities of water into the cellar; and after two or three days, they had access to the dead bodies.

Cælius Aurelianus says, that those who are injured by the fumes of charcoal become cataleptic. And Hoffman himself, in another part of his works, enumerates a train of symptoms which in no respect correspond with his idea of suffocation. Those who suffer from the fumes of burning charcoal, says he, have severe pains in the head, great debility, faintness, stupor, and lethargy.

It appears from the above histories and observations, that these vapours exert their noxious effects on the brain and nerves. Sometimes they occasion sudden death; at other times, the various symptoms of a debilitated nervous system, according as the poison is more or less concentrated. The olfactory nerves are first and principally affected, and the brain and nervous system by sympathy or consent of parts. It is well known, that there is a strong and ready consent between the olfactory nerves and many other parts of the nervous system. The effluvia of flowers and perfumes, in delicate or irritable habits, produce a train of symptoms, which, though transient, are analogous to those which are produced by the vapours of charcoal; viz. vertigo, sickness, faintness, and sometimes a total insensibility. The female malefactor, whom Dr Mead inoculated by putting into the nostrils dosils of cotton impregnated with variolous matter, was, immediately on the introduction, afflicted with a most excruciating headach, and had a constant fever till after the eruption.

The vapours of burning charcoal, and other poisonous effluvia, frequently produce their prejudicial, and even fatal effects, without being either offensive to the smell or oppressive to the lungs. It is a matter of importance therefore, that the common opinion should be more agreeable to truth; for, where suffocation is supposed to be the effect, there will be little apprehension of danger, so long as the breath keeps free from pain or oppression.

It may be well to remember, that the poison itself is distinct from that gross matter which is offensive to the smell; and that this is frequently in its most active state when undisturbed by the sense. Were the following cautions generally attended to, they might in some instances be the happy means of preserving life. Never to be confined with burning charcoal in a small room, or where there is not a free draught of air by a chimney or some other way. Never to venture into any place in which air has been long pent up, or which from other circumstances ought to be suspected; unless such suspected place be either previously well ventilated, or put to the test of the lighted candle. For it is a singular and well-known fact, that the life of flame is in some circumstances sooner affected and more expeditiously extinguished by noxious vapours, than animal-life. A proof of which I remember to have received from a very intelligent clergyman, who was present at a musical entertainment in the theatre at Oxford. The theatre was crowded; and during the entertainment, the candles were observed to burn dim, and some of them went out. The audience complained only of faintness and languor; but had the animal effluvia been still further accumulated or longer confined, they would have been extinguished as well as the candles.

The most obvious, effectual, and expeditious means of relief to those who have unhappily suffered from this cause, are such as will dislodge and wash away the poison, restore the energy of the brain and nerves, and renew the vital motions. Let the patient therefore be immediately carried into the open air, and let the air be fanned backwards and forwards to assist its action: let cold water be thrown on the face; let the face, mouth, and nostrils, be repeatedly washed; and as soon

as practicable, get the patient to drink some cold water. But if the case is too far gone to be thus relieved, let a healthy person breathe into the mouth of the patient; and gently force air into the mouth, throat, and nostrils. Frictions, cupping, bleeding, and blisters, are likewise indicated. And if, after the instant danger is removed, a fever be excited, the method of cure must be adapted to the nature and prevailing symptoms of the fever."

With regard to the poison of opium, Dr Mead recommends the following method of cure. Besides evacuations by vomiting, bleeding, and blistering, acid medicines and lixivial salts are proper. These contract the relaxed fibres, and by their diuretic force make a depletion of the vessels. Our author says he hath given repeated doses of a mixture of salt of wormwood and juice of lemons, with extraordinary success.

Of a kind somewhat akin to the poison of opium seems to be that of laurel-water, a simple water distilled from the leaves of the *lauro-cerasus* or common laurel. The bad effects of this were first observed in Ireland, where it had been customary to mix it with brandy for the sake of the flavour; and thus two women were suddenly killed by it. This gave occasion to some experiments upon dogs, in order to ascertain the malignant qualities of the water in question; and the event was as follows: All the dogs fell immediately into totterings and convulsions of the limbs, which were presently followed by a total paralysis, so that no motion could be excited even by pricking or cutting them. No inflammation was found, upon dissection, in any of the internal membranes. The most remarkable thing was a great fulness and distension of the veins, in which the blood was so fluid, that even the lymph in its vessels was generally found tinged with red. The same effects were produced by the water injected into the intestines by way of clyster.

To make the experiment more fully, Dr Nicholls prepared some of this water so strong, that about a drachm of heavy essential oil remained at the bottom of three pints of it, which by frequent shaking was again quite incorporated with it. So virulent was this water, that two ounces of it killed a middle sized dog in less than half a minute, even while it was passing down his throat. The poison appeared to reside entirely in the above-mentioned essential oil, which comes over by distillation, not only from the leaves of laurel, but from some other vegetables; for ten drops of a red oil distilled from bitter almonds, when mixed with half an ounce of water, and given to a dog, killed him in less than half an hour.

Volatile alkalis are found to be an antidote to this poison; of which Dr Mead gives the following instance. About an ounce of strong laurel-water was given to a small dog. He fell immediately into the most violent convulsions, which were soon followed by a total loss of his limbs. When he seemed to be expiring, a vial of good spirit of sal ammoniac was held to his nose, and a small quantity of the same forced down his throat: he instantly felt its virtue; and by continuing the use of it for some time, he by degrees recovered the motion of his legs; and in two hours walked about with tolerable strength, and was afterwards quite well.

With regard to the pernicious effects of cold, there is no other way of counteracting them but by the application of external heat. We are apt to imagine, that the swallowing considerable quantities of ardent spirits may be a means of making us resist the cold, and preventing the bad effects of it from arising to such an height as to destroy life; but these do not appear to be in the least possessed of any such virtue in those countries liable to great excesses of cold. The Peruvian bark, by strengthening the solids, as well as increasing the motion of the fluids, is found to answer better than any other thing as a preservative: but when the pernicious effects have already begun to discover themselves, nothing but increasing by some means or other the heat of the body can possibly be depended upon: and even this must be attempted with great care; for as, in such cases, there is generally a tendency to mortification in some of the extremities, the sudden application of heat will certainly increase this tendency to such a degree as to destroy the parts. But for the external treatment of such mortifications, see the article SURGERY.

### CIII. APOPLEXY from *Passions of the Mind*. Sp. VII.

374

Carus a pathemate, *Sauv.* sp. 11.  
Asphyxia a pathemate, *Sauv.* sp. 7.  
Eclipsis catache, *Sauv.* sp. 1.  
Eclipsis resoluta, *Sauv.* sp. 2.

APOPLEXIES from violent passions may be either sanguineous or serous, though more commonly of the former than the latter species. The treatment is the same in either case. Or they may partake of the nature of catalepsy; in which case the method of treatment is the same with that of the genuine catalepsy. See below.

### CIV. The *Cataleptic APOPLEXY*. Sp. VIII.

375

Cataleptis, *Sauv.* gen. 176. *Lin.* 129. *Veg.* 230.  
*Sag.* gen. 281. *Boerb.* 1036. *Juncq.* 44.

Dr CULLEN says he has never seen the catalepsy except when counterfeited; and is of opinion that many of those cases related by other authors have also been counterfeited. It is said to come on suddenly, being only preceded by some labour of body and mind; and to return by paroxysms. The patients are for some minutes, sometimes (though rarely) for some hours, deprived of their senses, and all power of voluntary motions; but constantly retaining the position in which they were first seized, whether lying or sitting; and if the limbs are put into any other posture during the fit, they will keep the posture in which they are placed. When they recover from the paroxysm, they remember nothing of what passed during the time of it, but are like persons awakened out of sleep.—Concerning the cure of this disorder we find nothing which can be depended upon among medical writers.

### CV. APOPLEXY from *Suffocation*. Sp. IX.

376

Asphyxia suspensorum, *Sauv.* sp. 4.  
Asphyxia immerforum, *Sauv.* sp. 1.

This is the kind of apoplexy which takes place in those

ARTICLE those who are hanged or drowned. For the treatment of those persons, see the articles DROWNING and HANGING.

Besides the species above-mentioned, the apoplexy is a symptom in many other distempers, such as fevers both continued and intermitting, exanthemata hysteria, epilepsy, gout, worms, ichuria, and scurvy.

#### GENUS XLV. PARALYSIS, the Palsy.

Paralysis, *Boerh.* 1057.

Hemiplegia, *Sauv.* gen. 170. *Lin.* 103. *Vog.* 228.

Paraplexia, *Sauv.* gen. 171.

Paraplegia, *Lin.* 102. *Vog.* 227.

Paralysis, *Sauv.* gen. 169. *Lin.* 104. *Vog.* 226.

*Junc.* 115.

Atonia, *Lin.* 120.

#### CVI. The Partial Palsy. Sp. I.

Paralysis, *Sauv.* gen. 169. *Lin.* 104. *Vog.* 226.

*Junc.* 115.

Paralysis plethorica, *Sauv.* sp. 1.

Paralysis serosa, *Sauv.* sp. 12.

Paralysis nervea, *Sauv.* sp. 11.

Mutitas a glossolysii, *Sauv.* sp. 1.

Aphonia paralytica, *Sauv.* sp. 8.

#### 377 CVII. HEMIPLEGIA, or Palsy of one side of the Body. Sp. II.

Hemiplegia, *Sauv.* gen. 170. *Lin.* 108. *Vog.* 228.

*Sag.* gen. 276.

Hemiplegia ex apoplexia, *Sauv.* sp. 7.

Hemiplegia spasmodica, *Sauv.* sp. 2.

Hemiplegia serosa, *Sauv.* sp. 10.

#### 378 CVIII. PARAPLEGIA, or Palsy of one half of the Body taken transversely. Sp. III.

Paraplexia, *Sauv.* gen. 171. *Sag.* gen. 277.

Paraplegia, *Lin.* 102. *Vog.* 227.

Paraplexia sanguinea, *Sauv.* sp. 2.

Paraplexia a pima bilida, *Sauv.* sp. 3.

Paraplexia rheumatica, *Sauv.* sp. 1.

*Description.* The palsy shows itself by a sudden loss of tone and vital power in a certain part of the body. In the slighter degrees of the disease, it only affects a particular muscle, as the sphincter of the anus or bladder, thus occasioning an involuntary discharge of excrements or of urine; of the muscles of the tongue, which occasions flammering, or loss of speech; of the muscles of the larynx, by which the patient becomes unable to swallow solids, and sometimes even liquids also — In the higher degrees of the disease, the paralytic affection is diffused over a whole limb, as the foot, leg, hand, or arm; and sometimes it affects a whole side of the body, in which case it is called *hemiplegia*; and sometimes, which is the most violent case, it affects all the parts below the waist, or even below the head, though this last is exceedingly rare. In these violent cases, the speech is either very much impeded, or totally lost. Convulsions often take place in the sound side, with the cynic spasm or involuntary laughter, and other distortions of the face. Sometimes the whole paralytic part of the body becomes livid, or even mortifies before the patient's death; and sometimes the paralytic parts gradually

decay and shrivel up, so as to become much less than before.

*Causes, &c.* Palsies must commonly supervene the different species of coma, especially the apoplexy. They are also occasioned by any debilitating power applied to the body, especially by excesses in venery. Sometimes they are a kind of crisis to other distempers, as the colic of *Poictou*, and the apoplexy. The hemiplegia especially often follows the last mentioned disease. Aged people, and those who are by any other means debilitated, are subject to palsy; which will sometimes also affect even infants, from the repulsion of exanthemata of various kinds. Palsies are also the infallible consequences of injuries of the large nerves.

*Prognosis.* Except in the slighter cases of palsy, we have little room to hope for a cure; however, death doth not immediately follow even the most severe paralytic affections. In an hemiplegia it is not uncommon to see the patients live several years; and even in the paraplegia, if death does not ensue within two or three weeks, it may not take place for a considerable time. It is a promising sign when the patient feels a slight degree of painful itchinels in the affected parts; and if a fever should arise, it bids fair to cure the palsy. When the sense of feeling remains, there is much more room to hope for a cure than where it is gone, as well as the power of motion. But when we observe the flesh to waste, and the skin to appear withered and dry, we may look upon the disease to be incurable. Convulsions supervening on a palsy are a fatal sign.

*Cure.* Many remedies have been recommended in palsies: but it must be confessed, that, except in the slighter cases, medicines seldom prove effectual; and before any scheme of cure can be laid down, every circumstance relative to the patient's habit of body and previous state of health should be carefully weighed. If an hemiplegia or paraplegia should come on after an apoplexy, attended with those circumstances which physicians have supposed to denote a viscid state of the blood, a course of the attenuant gums, with fixed alkaline salts, and chalybeate waters, may do service; to which it will be proper to add frictions with the volatile liniment all down the spine: but in habits where the blood is rather inclined to the watery state, it will be necessary to give emetics from time to time; to apply blisters, and cut issues.

The natural hot baths are often found useful in paralytic cases; and where the patients cannot avail themselves of these, an artificial bath may be tried by dissolving salt of steel in water, and impregnating the water with fixed air. Frictions of the parts, and scourging them with nettles, have also been recommended, and may do service, as well as volatile and stimulating medicines taken inwardly.

#### CIX. THE Palsy from Poisons. Sp. IV.

Paralysis metallariorum, *Sauv.* sp. 22.

Hemiplegia saturnina, *Sauv.* sp. 14.

This kind of palsy arises most frequently from lead taken into the body, and is a consequence of the *colica pictonum*, under which it is particularly treated. See below.



CX. TREMOR, or TREMBLING.

Tremor, *Sauv.* gen. 129. *Lin.* 139. *Vog.* 184. *Sag.* 236.

This by Dr Cullen is reckoned to be always symptomatic either of palsy, atonia, or convulsions; and therefore cannot be treated of by itself.

ORDER II. ADYNAMIÆ.

ADYNAMIÆ, *Vog.* Clafs VI.

Defectivi, *Lin.* Clafs VI. Order I.

Leipopychia, *Sauv.* Clafs VI. Order IV. *Sag.*

Clafs IX. Order IV.

GENUS XLVI. SYNCOPE, or FAINTING.

Syncope, *Sauv.* gen. 174. *Sag.* 94. *Vog.* 274. *Sag.* 280. *Junch.* 119.

Leipothymia, *Sauv.* gen. 173. *Lin.* 93. *Vog.* 273. *Sag.* 279.

Apfyxia, *Sauv.* gen. 175. *Lin.* 95. *Vog.* 275. *Sag.* 281.

Virium lapsus et animi deliquia. *Hoffm.* III. 267.

CX. The Cardiac SYNCOPE. Sp. I.

Syncope plethorica, *Sauv.* sp. 5. *Senac.* Tr. de Cœur, p. 540.

Syncope a cardiogmo, *Sauv.* sp. 7. *Senac.* de Cœur, 414. *Morgagn.* de Sed. XXV. 2. 3. 10.

Syncope a polypto, *Sauv.* sp. 8. *Senac.* p. 471.

Syncope ab hydrocardia, *Sauv.* sp. 12. *Senac.* 533. *Schreiber* Almag. L. III. § 196.

Syncope lanzoni, *Sauv.* sp. 18. *Lanzon.* Op. II. p. 462.

Apfyxia valsalviana, *Sauv.* sp. 13.

CXI. Occasional SYNCOPE. Sp. II.

Leipothymia a pathemate, *Sauv.* sp. 1. *Senac.* p. 544.

Syncope pathetica, *Sauv.* sp. 21.

Apfyxia a pathemate, *Sauv.* sp. 7.

Syncope ab antipathia, *Sauv.* sp. 9. *Senac.* p. 554.

Syncope a veneno, *Sauv.* sp. 10. *Senac.* p. 546.

Syncope ab apostematis, *Sauv.* sp. 11. *Senac.* p. 554.

Syncope a sphacelo, *Sauv.* sp. 14. *Senac.* p. 553.

Syncope ab inanitione, *Sauv.* sp. 1. *Senac.* p. 536.

Syncope a phlebotomia, *Sauv.* sp. 4.

Syncope a dolore, *Sauv.* sp. 2. *Senac.* p. 583.

Apfyxia traumatica, *Sauv.* sp. 14.

Apfyxia neophytorum, *Sauv.* sp. 17.

*Description.* A syncope begins with a remarkable anxiety about the heart; after which follows a sudden extinction, as it were, not only of the animal-powers and actions, but also of the vital powers, so that the patients are deprived of pulse, sense, and motion, all at once. In those cases which physicians have distinguished by the name of *leipothymia*, the patient does not entirely lose his senses, but turns cold and pale; and the pulse continues to beat, though weakly; the heart also seems to tremble rather than beat; and the respiration is just perceptible. But in the true syncope or full apfyxia, not the smallest sign of life can be perceived; the face hath a death-like paleness, the

extremities are cold, the eyes shut, or at least troubled; the mouth sometimes shut, and sometimes gaping wide open; the limbs flaccid, and the strength quite gone; as soon as they begin to recover, they fetch deep and heavy sighs.

*Causes, &c.* Fainting is occasioned most commonly by profuse evacuations, especially of blood; but it may happen also from violent passions of the mind, from surfeits, excessive pain, &c. People of delicate constitutions are very subject to it from slight causes; and sometimes it will arise from affections of the heart and large vessels not easy to be understood. Fainting is also a symptom of many disorders, especially of that fatal one called a *polypus of the heart*, of the plague, and many putrid diseases.

*Prognosis.* When fainting happens in the beginning of any acute distemper, it is by no means a good omen; but when it takes place in the increase or at the height of the disease, the danger is somewhat less; but in general, when fainting comes on without any evident cause, it is to be dreaded. In violent hemorrhages it is favourable; as the bleeding vessels thus have time to contract and recover themselves, and thus the patient may escape.

*Cure.* When persons of a full habit faint through excess of passion, they ought to be blooded without delay, and should drink vinegar or lemon-juice diluted with water; and, after the bowels are emptied by a clyster, take a pargoric draught, and go to bed.

The passion of anger, in a peculiar manner, affects the biliary secretion, causes an oppression at the stomach, with nausea and retching to vomit, and a bitter taste in the mouth, with giddiness: these symptoms seem to indicate an emetic; which, however, in these cases must be carefully avoided, as it might endanger the patient, by bringing on an inflammation of the stomach.

The general effects of a sudden fright have been mentioned on a former occasion. When these are so violent as to require medical aid, our first endeavours must be to take off the spasmodic constriction, and restore freedom to the circulation; by bleeding, if the habit be at all inclined to fulness; and by giving a mixture, with equal parts of the vinum antimonialle and elixir pargoricum, in some agreeable vehicle, which will bring on sleep and encourage perspiration. It was formerly mentioned, that convulsions, or even an epilepsy, may be brought on by frights; which should make people cautious of playing foolish tricks in this way.

When a surfeit, or any species of saburra, occasions a leipothymia, an emetic is the immediate remedy, as soon as the patient, by the help of acrid stimulants, shall be so far roused as to be able to swallow one: in these cases, tickling the fauces with a feather dipt in spirit of hartshorn, will be proper, not only to rouse the patient, but also to bring on vomiting.

A syncope is most commonly brought on by profuse discharges or evacuations, either of the blood or of the secreted humours.

In order to revive the patients, they ought to be laid again in a horizontal posture, in an airy place; the legs, thighs, and arms, are to be rubbed with hot fannels; very strong vinegar, or salt of hartshorn, or the spirit of this or of sal ammoniac are to be held to

to the nostrils, and rubbed into them, or, being properly diluted, poured down the throat; cold water is to be sprinkled on the face and neck; and when by these means the patient shall be sufficiently revived, wine boiled up with some grateful aromatic, is to be given in the proper quantity.

In the fainting consequent upon profuse uterine hæmorrhages, it will be a safer practice to abstain from all heating and stimulant things; as life, in these cases, is preserved by the coagulation of the blood in the extremities of the open vessels; which might be prevented, by the pouring in hot wine or volatile alkaline spirits.

When a syncope is the consequence of the too violent operation of either an emetic or cathartic, the tinctura thebaica, mixed with spiced wine, is the most efficacious remedy; but the opiate must be given gradually, and in very small doses.

A syncope, or even asphyxia, wherein the patient shall lie for several hours, is frequent in hysterical constitutions; and during the fit requires fetid antispasmodics, together with acrid stimulants: to prevent returns, nothing answers better than the bark joined with chalybeates.

### 384 CXI. DYSPEPSIA, or Difficulty of Digestion. Genus XLVI.

Dyspepsia, *Vog.* 277.

Apepsia, *Vog.* 276.

Diaphora, *Vog.* 278.

Anorexia, *Sauv.* gen. 162. *Lin.* 116. *Sag.* gen. 268.

Cardialgia, *Sauv.* gen. 202. *Lin.* 48. *Vog.* 157. *Sag.* gen. 160.

Gastrodynia, *Sauv.* gen. 203. *Sag.* gen. 161.

Soda, *Lin.* 47. *Vog.* 161.

Nausea, *Sauv.* gen. 250. *Lin.* 182. *Vog.* 159. *Sag.* gen. 185.

Vomitus, *Sauv.* gen. 251. *Lin.* 183. *Vog.* 214. *Sag.* gen. 186.

Flatulencia, *Sauv.* gen. 271. *Lin.* 165. *Vog.* 127. *Sag.* gen. 207.

#### The idiopathic Species are,

Anorexia pituituosa, *Sauv.* sp. 2.

Anorexia a saburra, *Sauv.* sp. 9.

Anorexia exhaustorum, *Sauv.* sp. 8.

Anorexia paralytica, *Sauv.* sp. 1.

Nausea ex cacochylia, *Sauv.* sp. 11.

Vomitus pituitosus, *Sauv.* sp. 26.

Vomitus ruminatus, *Sauv.* sp. 6.

Vomitus a saburra, *Sauv.* sp. 2.

Vomitus a crapula, *Sauv.* sp. 1.

Vomitus lacteus, *Sauv.* sp. 3.

Flatulencia infantilis, *Sauv.* sp. 5.

Flatulencia acida, *Sauv.* sp. 1.

Flatulencia nidrosa, *Sauv.* sp. 2.

Cardialgia bradypeptæ, *Sauv.* sp. 9.

Cardialgia a saburra, *Sauv.* sp. 2.

Cardialgia lactantium, *Sauv.* sp. 11.

Cardialgia flatulenta, *Sauv.* sp. 3.

Cardialgia paralytica, *Sauv.* sp. 7.

Gastrodynia faburralis, *Sauv.* sp. 1.

Gastrodynia flatulenta, *Sauv.* sp. 2.

Gastrodynia periodynia, *Sauv.* sp. 7.

Gastrodynia astringens, *Sauv.* sp. 9.

Gastrodynia atterens, *Sauv.* sp. 10.

Gastrodynia a frigore, *Sauv.* sp. 18.

Besides these there are a great number of symptomatic Species.

*Description.* It is by no means easy to define exactly the distemper called *dyspepsia*, when considered as an original disease, seeing there are very few maladies which some way or other do not shew themselves by an affection of the stomach; and much more difficult still must it be to enumerate all its symptoms. The most remarkable, however, and the most common, are the following: Want of appetite; distension of the stomach when no food hath been taken for some time before; slight defection of spirits; a gradual decay of the muscular strength; languor, and aversion from motion; the food which is taken without appetite is not well digested; the stomach and intestines are much distended with flatus, whence the patients are tormented with spasms, gripes, and sickness: frequently a limpid water, having an acid or putrid taste, is brought up; sometimes the food itself is thrown up by mouthfuls; and sometimes, though rarely, the same is swallowed again, after the manner of ruminating animals. While matters are in this situation, the heart sometimes palpitates, and the breath is quick, and drawn with difficulty; the head aches and is giddy; and sometimes both these symptoms are continual, and very violent, inasmuch that the patient is not only tormented with pain, but flaggers as if he was drunk. By reason of the too great accefency or putrefaction of the aliment, a cardialgia or heartburn comes on, and in this situation a spontaneous diarrhœa sometimes carries off the disease; but in other cases there is an obstinate costiveness, attended with colic-pains. Frequently the pulse is quick, sometimes slow, but always weak: the circulation is so languid that the blood can scarce reach the extreme vessels, or at least stagnates in them, so that the face becomes livid, swelled, and has an unusual appearance: and at the same time that the circulation and nervous power are in this languid state, the perspiration becomes less copious; the skin becomes dry and corrugated; the natural heat, especially of the extremities, is much diminished; the tongue is white; and an universal laxity takes place, inasmuch that the uvula and velum pendulum palati are sometimes enlarged to such a degree as to become extremely troublesome. The patient is either deprived of rest, or wakes suddenly out of his sleep, and is disturbed by frightful dreams; at the same time that the mind seems to be affected as well as the body, and the person becomes peevish, fretful, and incapable of paying attention to any thing as usual. At last hectic symptoms come on, and the whole frame becomes so irritable, that the slightest cause excites an universal tremor, and sometimes violent vomiting and diarrhœa. Sometimes the salivary glands are so relaxed, that a salivation comes on as if excited by mercury; the serum is poured out into the cavity of the abdomen and cellular substance of the whole body, and the patient becomes affected with anasarca or ascites.

*Causes, &c.* The causes of dyspepsia may be any thing which debilitates the system in general, but in a particular

particular manner affects the stomach. Such are opium taken in immoderate quantities, which hurts by its sedative and relaxing powers; spirituous liquors drunk to excess; tobacco, tea, coffee, or any warm relaxing liquor, taken in too great quantity; acid, unripe fruits; vomits or purges too frequently taken; an indolent sedentary life, &c. &c. All these act chiefly upon people of a weak and delicate habit; for the robust and hardy seldom labour under a dyspepsia, or at most a very slight one.

*Prognosis.* When a dyspepsia first occurs, it is frequently removed without great difficulty; when it is symptomatic, we must endeavour to cure the primary disease; but when it frequently returns with symptoms of great debility, hectic, or dropsy, we have great reason to dread the event.

*Cure.* A radical cure of dyspepsia is only to be expected from tonic medicines, which can remove from the stomach and system that debility on which the disease depends. But, previous to their use, it will be necessary to evacuate the contents of the alimentary canal by vomits or purgatives. If there is a tendency to putrefescency, antiseptics must then be exhibited; but more frequently there is a prevailing acidity, which creates an intolerable heart-burn. To palliate this symptom, magnesia alba may be given; which is much preferable to the common terrefacous powders, as being purgative when dissolved in an acid, while the others are rather astringent. In the third volume of the Medical Observations, we have an account of two cases of dyspepsia attended with a very uncommon degree of cardialgia, in which magnesia was so successful, that we can scarce doubt of its efficacy in lighter degrees of the disorder. They were communicated by Dr Watson.

"A woman, aged 34, the mother of several children, was taken, in the fourth month of her pregnancy with violent vomitings; which growing daily worse, notwithstanding the endeavours of her apothecary to restrain them, brought on at the end of a month such severe pains in the stomach, and spasms in her abdomen, as to occasion abortion. The vomitings were not lessened by this event, but grew worse, and frequently brought on general convulsions to such a degree, that she was many times supposed to be at the point of death.

"Scarce any medicine staid with her, she brought up almost instantly whatever was given her as nourishment, either in a solid or liquid form. She was exceedingly pale, and very much emaciated; her flesh was cold to the touch; and, though her urine was little in quantity, it was perfectly limpid. She had a continual thirst, and was, in a considerable degree, colicive. Her pulse was slow and quick, and she was frequently tormented with the hicough. The pain in her stomach was severe and constant, and whatever she brought up was sharp to such a degree, as to make her mouth and throat very sore. These parts upon examination appeared high-coloured, and in many places excoriated; and the pain she felt in her stomach upon swallowing any liquor, that had the least degree of acrimony, or was more than luke-warm, made it probable the stomach itself, in its internal surface, was affected in the same manner.

"In this wretched state I was consulted; and must

confess that I was much at a loss how to relieve a patient so debilitated, and whose stomach was in so diseased a state, that it seemed incapable of retaining any appropriated remedies long enough to correct the acrimony of the juices, and restore the secretions to a more mild and natural state. Anti-emetics of various kinds had been tried without effect, particularly saturated solutions of alkaline salt in juice of lemons. Stomachic medicines of the warm and aromatic kind she could not bear, on account of their poignancy; and, tho' nothing could so speedily correct the almost caustic acid of the gastric juice as solutions of alkaline salts, neither the fauces or gullet could bear their acrimony.

My expectations of relieving this patient, small as they were, depended upon my being able to neutralize, and thereby lessen, the stimulus of the acid of the stomach. To accomplish this was not very easy, as no medicine in small doses could in any considerable degree correct so intense an acid; and, in the present situation, it was difficult to get any medicine to stay long enough to exert its effects. To discharge however what acid matter might be already accumulated in the stomach, I directed that the patient should drink plentifully of small, warm, unsalted mutton-broth, and vomit with it so long that it should be discharged with no other taste than that of broth. This was complied with, and a large quantity drank. The pain in her stomach ceased upon this for more than two hours, and was after that time apparently coming on with the same violence as before. Upon which I ordered a drachm of magnesia to be given in two ounces of veal-broth. This kept down, and eased her; I therefore directed the same dose to be repeated as often as the pain returned, without any regard to the quantity that the whole might amount to, supposing that the pain continued severe. This was done: and in three days she took three ounces of magnesia, of which very few doses were vomited up, and she was purged considerably.

"This medicine was continued in a somewhat less quantity for three days longer, in which she took two ounces more of magnesia; by this time the vomitings ceased, the convulsions left her, she had no pains in the stomach, and her mouth and fauces lost their intensely red colour and soreness; nor did even her eructations longer indicate any acidity.

"Besides veal-broth she was allowed boiled rice, and now then some rice gruel with a small quantity of brandy; and after a few days more she could retain boiled chicken, and other light, solid, animal-food.

"When her stomach was in this state, she took liberally of *decoti. cort. Peruvian.* with a small portion of French brandy, by which and her nourishment, she recovered her strength surprisingly. To this medicine, as she was during the latter part of her illness considerably anasarous, were added some preparations of steel; and in about a month she perfectly recovered.

"When this patient's stomach was relieved, the thirst, the general and partial spasms, and other complaints, which were merely symptomatic, soon ceased; and what remained of her cure was by no means difficult.

"Since the above-quoted case, I was consulted in another



erice another, in almost every respect similar, except that the former began in pregnancy. The vomitings attended with acidity had continued more than a month; the patient's stomach rejected every kind of food and medicine; she was debilitated to a great degree, and universally anarcous.

"Upon being sent for, I directed for her magnesia, much in the same manner as for the former patient; and in a very few days her vomitings ceased, her stomach became stronger, and in less than a fortnight the anasarca disappeared. But it was a considerable time, as this person was more advanced in years than the former, before she recovered her strength, notwithstanding my best endeavours for that purpose. She at length however perfectly recovered."

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**CXII. HYPOCHONDRIASIS, the HYPOCHONDRIAC AFFECTION. Genus XLVII.**

Hypochondriasis, *Sauv.* gen. 220. *Lin.* 76. *Vog.* 218. *Sag.* 332.

Morbus hypochondriacus, *Boerh.* 1098.

Malum hypochondriacum, *Hoffm.* III. 64. *Junch.* 36.

Hypochondriasis melancholica, *Sauv.* sp. 3.

*Description.* The symptoms of hypochondriasis are, stretching, pressing, griping, and tormenting pains under the ribs, and chiefly in the left side; which sometimes are exasperated, and become pungent, burning, or lancinating. Frequently there is an inflation of the left hypochondriacum, which sometimes becomes stationary, and by Hippocrates was taken for a symptom of an enlarged spleen. When these symptoms takes place in the right hypochondrium, they are commonly attended with colic-pains, uncertain flying heats, especially in the head, with a transient redness of the face, and very frequently an oedematous swelling of the feet succeeds; and besides these, all the other symptoms of dyspepsia occur, together with limpid urine, and those unaccountable affections of mind common in hysterical patients, though generally in a somewhat less degree than in them.

*Causes, &c.* The general causes of the hypochondriac affection are said to be a plethora, and preternatural thickness of the blood; suppressions of customary evacuations; high and full diet, together with a sparing quantity of drink; an hereditary disposition; indolence; atony of the intestines; violent passions of the mind, &c.

*Prognosis.* The hypochondriac affection, when left to itself, is more troublesome than dangerous; but, if improperly treated, may bring on various diseases of a more dangerous nature, such as the hypochondriac melancholy; bloody urine and nephritis, jaundice, vertigo, palsy, apoplexy, &c.

*Cure.* This is to be attempted by such medicines as attenuate the viscid juices, and restore the tone of the system, and which may be all comprehended under bleeding, gentle evacuates, chalybeates, the Peruvian bark, and exercise, especially riding on horseback, which in this disease is greatly preferable to any other. When the circumstances of the patient can afford it, a voyage to Spain, Portugal, or some of the warmer countries in Europe, will be of great service.

**CXIII. CHLOROSIS, the GREEN-SICKNESS.**

**GENUS XLVIII.**

Chlorosis, *Sauv.* gen. 309. *Lin.* 222. *Vog.* 305.

*Sag.* gen. 135. *Boerh.* 1285. *Hoffm.* III. 311. *Junch.* 86.

Chlorosis virginea, *Sauv.* sp. 1.

a. Chlorosis amatoria.

*Description.* This disease usually attacks girls a little after the time of puberty, and first shews itself by symptoms of dyspepsia. But a distinguishing symptom is, that the appetite is entirely vitiated, and the patient will eat lime, chalk, ashes, salt, &c. very greedily; while at the same time there is not only a total inappetence to proper food, but it will even excite nausea and vomiting. In the beginning of the disease, the urine is pale, and afterwards turbid; the face becomes pale, and then assumes a greenish colour; sometimes it becomes livid or yellow: the eyes are sunk, and have a livid circle round them; the lips lose their fine red colour; the pulse is quick, weak, and low, though the heat is little short of a fever, but the veins are scarcely filled; the feet are frequently cold, swell at night, and the whole body seems covered with a soft swelling; the breathing is difficult: nor is the mind free from affection as well as the body; it becomes irritated by the slightest causes; and sometimes the patients love solitude, become sad and thoughtful. There is a retention of the menses throughout the whole course of the disorder; and at last, all the bad symptoms increasing, a leucophlegmasia, anasarca, atrophy, and death, succeed.

*Causes.* The cause of chlorosis is thought to be an atony of the muscular fibres of the alimentary canal, especially of the stomach, joined with a similar atony of the perspiratory vessels over the whole surface of the body, and the whole depending on an atony of those small arteries which pour out the menstrual blood. This atony may be occasioned by the same causes which bring on dyspepsia and hypochondriasis, but very frequently arises from love and other passions of the mind.

*Prognosis.* The chlorosis in all cases is tedious, though it doth not generally prove fatal; but we can never promise a certain cure unless the menses make their appearance.

*Cure.* The remedies here in general are the same as in the dyspepsia and hypochondriasis; only in the chlorosis stronger purgatives may be made use of: those which stimulate the rectum are useful by stimulating also the vessels of the uterus; and for this reason also venery is to be indulged where it can lawfully be done. The cold bath is also extremely proper.

**ORDER III. SPASMI.**

SPASMI, *Sauv.* Clafs IV. *Vog.* Clafs V. *Sag.* Clafs VIII.

Motorii, *Lin.* Clafs VII.

Morbi spasmidici et convulsivi, *Hoffm.* III. 9.

Spasmi et convulsiones, *Junch.* 45, 54.

Epilepsia, *Boerh.* 1071, 1088.

## CXIV. The TETANUS. Genus XLIX.

Tetanus, *Sauv.* gen. 122. *Lin.* 127. *Vog.* 180.*Sag.* gen. 228.Catochus, *Sauv.* gen. 123. *Lin.* 128. *Vog.* 183.*Sag.* gen. 229.Opisthotonos, *Vog.* 181.Episthotonos, *Vog.* 182.

On this distemper Dr Lionel Chalmers hath published a dissertation in the first volume of the Medical Observations, which being superior to any thing that hath appeared in other medical writers on the subject, we shall here lay before the reader.

"Of all the diseases to which man is subject, none deserves more to be considered than the opisthotonos and tetanus, either with regard to the variety of painful symptoms which almost without intermission distract the sick, or the danger of the diseases themselves, from which few recover, in comparison of the number they attack. In both, the vital actions are very imperfectly performed, most of those which are called *natural*, being as it were suspended at once, and so far is the patient from being able to execute any voluntary motion, that the whole machine undergoes the most excruciating distortions, from the violent and unnatural contractions of the muscles. Happy it is for the inhabitants of the more temperate climates, that such diseases appear rarely among them; but in those countries which lie in the more southern and warmer latitudes, they are endemic, especially to negro slaves. In South-Carolina, they shew themselves at all seasons, but not so often in winter, more frequently in spring and autumn; and are most common in the summer, when people work abroad and are alternately exposed to the scorching heat of the sun and heavy showers, which often happen suddenly, and greatly alter the temperature of the air. Others are seized with the opisthotonos, after sleeping without doors, that they may enjoy the deceitful refreshment of the cool night-air, when the weather is warm: one youth chose to cut off his hair and shave his head on a warm day in March, and went to bed without a cap; but the weather changed, and became cold in the night, and he was found rigid with that disease next morning.

"These diseases so rarely appear as originals in Europe, that a good history of them cannot be expected from the physicians who practise in that part of the world; nor has any thing like a full description been given of them by any ancient or modern author which I have seen. Hippocrates indeed takes notice of them in many places, and seems to regard them only as consequences of other diseases, or of wounds or ulcers of the nervous or tendinous parts, of which symptomatic kind of opisthotonos he gives three remarkable cases in *lib. V. § VII. de Morb. vulg.* and repeats them in another place; but the few symptoms he recounts do not shew themselves with us. Galen, Cælius Aurelianus, Aretæus, &c. seem only to have copied Hippocrates, with the addition of some supposititious symptoms, which really do not appear; and the little that Bontius says of it, is very faulty.

"Among the numerous class of spasmodic diseases, there are three which distinguish themselves in a very

particular manner, on which the names of *emprosthotonos*, *opisthotonos*, and *tetanus*, have been justly enough bestowed, as being expressive of the posture into which they throw and confine the patient: When therefore those muscles which bend the head, neck, and body forwards, suffer such involuntary, violent, and continued contractions, as fix the chin to the breast, incurvate the spine and body, and retain the sick in this painful and prone posture, the disease is called *opisthotonos*. When the posterior muscles are similarly affected, so that the head is drawn towards the spine, and the spine itself is recurvated, it has then the name of *emprosthotonos*; although in fact, in this, all those muscles which act in deglutition, bend the head forwards, or turn it to either side, are equally contracted with those which raise the head and spine. The *tetanus* differs from, or rather is compounded of, both the others; for in this the patient is found rigid and inflexible, being as it were braced between the opposite contractions of the anterior and posterior muscles; yet even here the head is much retracted.

"I never saw the *emprosthotonos*; and shall only speak of the *opisthotonos* and *tetanus*, the first being by far the most common, and in the last stage of which the tetanus frequently supervenes. And let it be observed, that the following description by no means respects such symptomatic contractions as often happen immediately before death, both in acute and chronic diseases; neither will it agree with that spurious *opisthotonos* or *tetanus*, which appear sometimes in the first and second stages of quotidian intermittents in this country, however they may emulate the true diseases in some of their symptoms.

"*STAD. I.* The *opisthotonos*, contrary to what Bontius asserts, often comes on gradually and by slighter approaches, the patient complaining rather of an uneasy stiffness in the back-part of the neck and about the shoulders, than of any acute pain, with some degree of a general lassitude. These increase, and become so troublesome when he attempts to turn his head, or to bend it forward, as to oblige him to walk very erect; for he can by no means look downward, nor to either side, without turning his whole body. He cannot open his jaws without pain; and has some difficulty in swallowing, which discourages him from attempting to eat. At times he feels a sudden and painful traction under the *cartilago ensiformis*, which strikes thro' to the back, and instantly increases the rigidity about the neck and shoulders, draws the head backward a little, and shuts the jaws closer. The pain under the *sternum* returns more frequently and with greater violence; and the other contractions become so strong, that the head from this time continues much retracted, and he now refuses nourishment, as swallowing is attended with great pain, and occasions a return of the spasm; which extends along the spine quite to the lower extremities, so that they will no longer support him, and he is under the necessity of going to bed.

"In this manner passes over the first stage of the *opisthotonos*, which sometimes takes up three or four days; the patient, as well as those about him, mistaking the first appearances of it for that rheumatic complaint, which is commonly called a *crick in the neck*: but it sometimes forms itself much quicker, and

invades the unfortunate person with the whole train of its mischievous symptoms, in a few hours: in which case, the danger may truly be estimated from the violence of the first attack; for such generally die in 24, 36, or 48 hours, and very rarely survive the third day. But when it is less acute, few are lost after the ninth or eleventh; which number of days it would not be possible for them to complete, unless the violence of the disease was in a good measure subdued; although I had one who recovered, after having been subject to its tyrannical attacks daily for six weeks. In this stage the pulse is slow, and very hard, and the belly is bound; blood taken away seems not to be altered from the natural state, so that no indication can be deduced therefrom, and only varies with regard to laxity or compaction, according to the age of the person and season of the year.

“**STAD. II.** The spasm under the sternum (which is the pathognomic symptom of this disease) becomes more violent, returning every 10 or 15 minutes; and never fails to be instantly succeeded by a stronger retraction of the head, with great rigidity, and pain all round the neck, and along the spine to the lower extremities which are suddenly put to the stretch. The countenance is very pale and contracted; the jaws are that moment snapped together, and cannot afterwards be opened so wide as to receive the end of one's little finger, an attempt to do which, by way of experiment, surely hurries on the spasm. The mastoid, coracohyoid and sternohyoid muscles, as well as all the others concerned in deglutition, and the deltoid and pectorals, are most violently contracted, so that the shoulders are strongly raised forward, and the arms are stretched out or drawn across the body; but the wrists and fingers seemed not to be affected.

“Such is the condition of the patient in the time of the spasm, which ceases in a few seconds: after which the shoulders and arms recline, and the inferior extremities relax; yet not so entirely, but that such a degree of rigidity for the most part remains, as will not permit them to bend, when this is attempted by another person; for as to the sick himself, he cannot at all move them. The muscles on the sides and forepart of the neck continue still contracted, altho' not so strongly; but their action is overcome by the number and strength of the posterior ones; so that the retraction of the head constantly remains. He breathes quick for some minutes, as if he had been excessively exercised; and the pulse is small, fluttering, and irregular, but both become more calm and slow. The face is sometimes pale in the intervals, but oftener flushed; and the whole countenance expresses strong appearances of the most melancholy distress, as well because of the dread he has of a return of the spasm, which he is sure will soon happen, as from the pain he suffers by the present contractions, and the more general and severe ones which he has so lately sustained. The tongue is stiff and torpid; but so far as it can be seen, is not foul. The belly is always bound, and cannot easily be loosened. In drinking, the liquid passes with great difficulty to the stomach, even in the smallest quantity; and if the spasm should seize him at that time, which an attempt to swallow for the most part occasions, the liquor returns through the nose with some force. The patients desire to lie still as

much as possible; and avoid drinking, speaking, or being moved, either of which are apt to occasion a return of the spasm.

“**STAD. III.** In this last stage, the patient is reduced to the most calamitous and distressful circumstances; for he is on a continual rack, according to the most literal meaning of that word, the spasm returning oftener than once in a minute, is much more violent, and holds him longer, so that he has scarcely any remission. The anterior muscles of the whole body now suffer equal contractions with the posterior; but the last overcome the force of the others, so that the spine is strongly recurvated, and forms a hollow arch with the bed, and he rests on the back part of the head and the heels. The belly is flat, and is drawn inward; and the muscles are so rigidly contracted, that they will not give way to pressure, and do not seem in the least to yield to the descent of the diaphragm in inspiration, the several muscles about the neck, sides, and abdomen, being plainly distinguishable from each other. Although the lower extremities are always rigid in this state, yet are they so suddenly and violently distended in the time of the spasms, that were it not for the standards-by, he would be projected feet foremost off the bed; while others again are as it were pushed upward with such a spring, that the head is struck with great force against whatever happens to be in the way, the thighs and legs being in this case no less rigid than the other parts. The tongue is spasmodically darted out, and is often miserably torn, as the teeth are that moment snapped together, so that it is necessary to prevent this by keeping the handle of a spoon, wrapped round with soft rags, between the teeth, when this can be done. At the time that the tongue is thus thrust out, the muscular flesh, which lies between the arch of the lower jaw and head of the trachea, seems to be drawn upwards within the throat. The countenance is very much contracted, and he is in a foam of sweat, the heat being very great; and the pulse between the spasms is exceeding quick, small, and irregular, although the heart throbs so strongly, that its motions may be plainly seen, and a palpitating subsultory kind of undulation may not only be felt, but perceived all over the epigastric region. The eyes are watery and languid, and a pale or bloody froth bubbles out from between the lips. The jaws are for the most part locked fast, so that it is impossible to give drink or nourishment, nor could he swallow if any thing was put into his mouth. In this state they are commonly delirious: and as they cannot subsist many hours, under so great a suspension of the vital and natural functions, a mortal anxiety ensues and releases them; oftener a continued and severe spasm finishes the tragedy, when it was before almost at an end: but most frequently a general convulsion puts a period to their sufferings; and whichever way this happens, they for the most part relax just before death.

“In the *tetanus*, the general symptoms are nearly the same as in the *opisthotonos*, except that from the first attack, the lateral, abdominal, and other anterior muscles, are equally contracted with the posterior ones; and the arms become rigid as well as the lower extremities. The abdomen is always flat and rigid as in the last stage of the *opisthotonos*, and its contents seem to be thrust up into the thorax, which at the same



time appears to be much dilated. There are here also some intervals between the spasms, in the time of which the cheeks are drawn towards the ears, so that all the teeth may be seen as in the *spasmus cynicus*. Deglutition is more free in this than in the other disease; yet so far is the sick from being equally balanced between the contractions of the opposite muscles, that the head is retracted and the spine is recurvated, although not quite so much as in the *opisthotonos*. And the spasm, which commences under the sternum, is likewise common to the tetanus, which terminates as the other, and on the same fatal days. But whoever recovers from either, labours long under a general atonia; and they cannot for some months raise themselves from a supine or recumbent posture without pain, nor without help for some time."

**Prognosis and Cure.** There has never been any thing like a crisis observed in these frightful cases, or favourable termination from the mere efforts of nature, and therefore all the physician's dependence must be upon art. Fortunately it has been found, that opium is capable of giving some relief, if administered in proper time, and the disease happens not to be in the most violent degree: the warm bath must also be brought in aid; and the patients should lie horizontally in the bath, and while in it have the whole body extremely well rubbed: when taken out, they are not to be dried, but immediately put to bed wrapt in the softest blankets; and while they remain there, the belly ought either to be fluped, or two or three bladders filled with warm water kept constantly lying on it. The bowels at the same time must, if possible, be kept open, by solutions of manna and *sul polychrest*, or some other purging salt, mixed with *oleum ricini*; or if that should not be at hand, with oil of sweet almonds and a little tincture of senna. The opiates are to be given in large and frequently repeated doses; such as a grain of the *extractum Thebaicum*, or 20 drops of the tincture, every second or third hour; and it will be safest not to trust to the Thebaic tincture which is kept ready prepared in the shops, but order the necessary dose of solid opium, and either give it in pills, or dissolve it in some convenient liquid. If swallowing should be difficult, or the jaws closed up, the opium must be given in clysters; for during the whole course of the disease it will be of service to order emollient clysters to be injected from time to time, since these will answer not only as a relaxing fomentation, but also contribute to keep the intestinal canal perfectly free.

When the patients recover, they continue for a long time very relaxed and weak; and no wonder, since it is the nature of all spasmodic affections to leave behind them extreme weakness and relaxation of the muscular fibres. In order to perfect the recovery, a course of the cortex and the Peruvian balsam is to be tried; and the spine may be rubbed with spirituous liniments, or with a mixture of rum and Barbadoes tar: but these and all other stimulating things, either internally or externally, during the violence of the spasms, must be omitted, since all of them, as well as blisters, are found to exasperate the disease.

This, in general, is the plan of treatment recommended by Dr Chalmers.

The same dreadful disorders frequently attack young children in the warm climates. Dr Hillary

tells us, that they will there arise from the same causes which usually produce convulsions in them in Britain, viz. a retention of the meconium or first excrement after birth; or from a glutinous matter which is too often found in the intestines of young children soon after the other is discharged; or from a cheffy matter from the coagulation of the milk by an acid in the stomach; or from hard excrements; or from something taken in by the mouth which is over acrid, or too hard to digest, which irritates their tender bowels, and so produces startings and convulsive spasms, with all the other symptoms which precede and accompany convulsions in young children in England; and shews how much more readily and easily the nerves are affected and irritated in that warm climate, and the tetanus produced from a much less cause there, than it is in England, where it is but seldom seen. But these causes not being timely removed, their acrimony is increased, partly by the heat of the climate, and partly by the fever which they produce, which still renders them more acrid, and so increases the irritation of their bowels, that it first brings on startings, then convulsive spasms, and regular convulsion-fits; which, if not soon removed, usually end in a perfect tetanus there, and the disease is but seldom cured in such young children when it arrives at that state: For when the child lies in this miserable, rigid, immovable condition, upon moving its hands or feet in the most gentle manner, or softly touching any part of its body, or giving it the least motion, even feeling its pulse in the most gentle, tender manner, or the least noise, or even touching its clothes, will bring on the convulsive spasms, and cause it to be strongly convulsed backwards, or drawn into a rigid straight line, strongly extended and immovable like a statue, and will so remain immovable out of either of those postures for a considerable time, a minute or two; and when the disease is arrived at this degree, our author thinks it is never cured. But if the physician is called in time, before the tetanus has come on, (which is too seldom the case there,) though he finds strong convulsive spasms have seized the child, or that it has had a convulsive fit or two, it may most commonly be relieved, the coming of the tetanus be prevented, and the life of the babe saved, as Dr Hillary has more than once seen, by removing and carrying off the irritating cause which stimulates their tender bowels, by such gentle evacuations as are suitable to their age; and then quieting and composing the irritation of their nerves with suitable anodynes, and correcting the remaining acrimony of the nutritious juices in the *prima via*.

To answer which intentions, the following method, with variations *pro re nata et pro ratione atatis*, as the cause is different, hath been found to answer the desired effect the best: *℞ Seri lactis ʒij. Sapon. Venet. ʒj. Manna chalap. ʒij. vel iij. Ol. amigd. dul. ʒfs. Feniculi dul. gut. ij. Bals. Peruv. gut. v. Misce, si. enema quam primum injicienda.*

And if the symptoms of the approaching tetanus will permit, he gives something of the following nature to assist the operation of the clyster, and to carry off the acrimony the sooner: *℞ Aq. sem. feniculi ʒij. Magnes. albæ ʒfs. Ocul. cancr. præp. ʒj. Syr. e cichor.*

*RACIPE cum rheo, rosar. solut. ana ʒiij. Misce. Or, R. Aq. sem. feniculi ʒiij. Sapon. anigdal ʒls. Magnes. albe ʒls. Syr. e cicbor. cum rheo, manna opt. ana ʒij. Ol. anigdal. dul. ʒiij. Misce: Exhibe cochl. parv. vel duo pro ratione ætatis omni semibora, vel omni hora, donec respond. alius.*

Two or three stools being obtained by these, the following is exhibited in order to abate the convulsive twitchings, and prevent the *tetanus* from coming on: *R. Aq. sem. feniculi ʒiij. Magnes. albe ʒls. Ocul. cancr. præp. ʒj. Moschi orient. gr. iij. Spir. C. C. ver. gut. xv. Syr. e mecon. ʒls. Misce: Exhibe cochl. parv. (a child's spoonful) ter quaterve de die, vel sæpius, urgent convuls. vel spasmi.*

But if the symptoms shew that the *tetanus* is more immediately coming on, so that we have no time to wait till the operation of the clyster and opening laxative be over, something of the following nature must be immediately given; or the *tetanus* will come on, and most probably prove fatal to such tender babes. *R. Aq. feniculi ʒiij. Moschi orient. gr. j. Tinct. Thebaic. gut. iij. Syr. e mecon. ʒij. Misce pro duobus dos. de quibus exhibe unam quam primum, et alteram si convuls. spasmi. redeunt.*

This may be thought a bold attempt, to give *tinct. Thebaica* to such a tender young infant: but it is to be considered that the little patient will certainly die if the *tetanus* seize it, and that it will come on if this do not prevent it; and our author has known a bold ignorant old midwife give four or five drops of that tincture to a very young infant without any prejudice more than its dosing three or four hours, though not in this case, but in one much less violent.

The clyster may be given at the same time, and the opening laxative not long after it: though it may retard the operation of that for some time, yet it operates soon after, and gives relief; after which the other medicines, and fomenting the body and anointing it as before, may be used, if the physician finds it necessary; also a little of the laxative mixture may be given once or twice a-day, if the above julep does not answer that intention of keeping the child's body open for a few days afterwards, which in this case is generally found necessary to be observed.

These methods and medicines may be varied according to circumstances. For neither the same method, nor same medicines, will answer in all cases, tho' the disease be the same; but they must be changed as the causes differ, or the constitution of the sick, or the time of the disease, or as some other circumstances may require: which is a thing of great importance, not only in this, but in the cure of most other diseases; wherefore it is mentioned here, chiefly to caution the practitioners in the West-Indies.

When proper medicines are thus timely and judiciously given in this case, they seldom fail to carry off the irritating cause, quieten and ease the nerves, remove the convulsions and spasms; and consequently prevent the *tetanus's* coming on, and the death of the patient. But if calling in the physician be deferred till the *tetanus* has already strongly seized the child, as is too often the case here, neither warm bathing, fomenting, nor any other methods or medicines whatever, will remove it or its causes, nor save the life of the little

tender patient.

Dr Chalmers gives an account of his having cured one child seized with a *tetanus*, by purging with an infusion of rhubarb; to which a few grains of musk, and a little *ol. tartar. per deliq.* were added, together with the warm bath, and the frequent injection of glysters made with an infusion of camomile-flowers, to each of which was added a small portion of Castile soap. It is much to be regretted, however, that in those cases where the assistance of the medical art is most wanted, it most generally fails. We have been assured by a gentleman who practised for some time in the warm parts of America, that out of 30 cases of the *tetanus* he had seen, not one of the patients recovered, though he had given opium to the quantity of 20 grains thrice a-day; and others, he was assured, had taken 30 grains thrice a-day. In the beginning of the disease, the medicine produced a violent head-ach; but towards the end, it had no manner of effect whatever. In two patients, the disease came on from the slightest causes imaginable. The one accidentally fell in attempting to avoid a loaded cart, and put the heel of his shoe upon one of his thumbs in rising; the other, in avoiding the same cart, slightly rubbed the skin of his nose. Both were seized with the *tetanus*; and both died, notwithstanding all possible assistance was given. The former had his thumb amputated, without effect.

In the Edinburgh Physical and Literary Essays, Vol. III. Dr Donald Monro, describes a new method of cure, communicated to him by a gentleman who was formerly a practitioner in Jamaica. While this gentleman practised in that island, he had under his care a great number of cases of *tetanus* attended with the locked-jaw. At first, he used to give very freely of opium, musk, and other medicines of this class; to bleed, and make other evacuations; while he used baths, fomentations, embrocations, and other external applications, but all without the least success; and, as he had lost a great many patients without being so lucky as to make one cure, he began to believe that this disorder always proved fatal, and was not to be cured by medicine, notwithstanding what some practitioners had alleged. However, having received an unexpected hint concerning the good effects of the mercurial ointment in such cases, he resolved to try it; and ordered the first patient that offered to be put into a warm room, and to be rubbed two or three times a-day with the ointment, till such time as a salivation was raised; when he with pleasure observed, that, as soon as the mercury began to affect the mouth, the convulsions of the muscles of the jaws, as well as all the other spasms and convulsions, ceased, and the patient was freed of all his complaints. After this, he treated every case of this kind which came under his care in the same manner, and cured twelve, which were all who applied to him for advice so early in the disorder that there was time to bring the mercury to the mouth before the fatal period was expected. A few died, in whom the disease was so far advanced before he saw them that there was not time to raise a salivation. None of the cases which were under this gentleman's care in the West Indies were the consequences of wounds or capital operations; nor has he had any opportunity of trying

it fince in cafes of the locked jaw, which sometimes follows capital operations, owing to his having given over practice : but he thinks, that, from the similarity of the complaint, there is no doubt but that the mercurial frictions would be equally efficacious in such cafes, as when the disorder comes from catching cold or other such causes.

In the second volume of the Medical Transactions, we have an account of a cure performed by means very different from any of those above related, by Dr William Carter at Canterbury.—On the 17th of May 1767, the doctor was called to a strong healthy man, in the 21st year of his age, and who had been confined to his bed for three weeks. What gave rise to his present disorder was a wound on the inner angle of his right leg, which he had received six weeks before from a joiner's chisel. At that time his mouth was so far closed, as to admit only the most liquid nourishment, which he constantly sucked through his teeth : but his legs and jaw, and the whole length of the spine dorsæ, were quite immovable, being as stiff and rigid as those of a person long dead; his head was drawn backward, and he was frequently strongly convulsed. The motion indeed of both his arms was but a little impaired. From the beginning to the end, his sight, hearing, and memory, continued perfect; his appetite was good; and his senses, in the day-time, entire, though sometimes wandering in the night. As to his pulse, that was regular; if it deviated at all from the pulse of a person in health, it was rather slow than quick, and somewhat fuller than natural. Such was the situation of his patient; a detail of which had been given before the doctor set out on his journey, which he undertook with a determined resolution to make use of the method recommended by Dr Silvester, in the first vol. of Medical Observations and Inquiries, published in the year 1757, (and which has been related from Dr Chalmers and Dr Hillary.) But, on his arrival at the house, he found great quantities of the *extractum thebaicum* dissolved had been already given him; and that, for the five last days, he had taken no less than 28 grains of that medicine, with 50 grains of muls, in the space of 24 hours, without any sensible effect, except the bringing on a confused sleep, out of which he frequently awoke in great hurries, attended with a violent pain in the head, which almost deprived him of his senses. The doctor was afraid to extend the dose; and soon determined to take some other method, though at a loss what method to pursue, as, during a course of almost 30 years practice, nothing of the same kind had ever fallen under his cognizance before. Reflecting, however, that this disorder had always been deemed of the spasmodic kind, and that the good effects produced by the *extractum thebaicum* must probably be owing to the relaxing and resolving faculty of that medicine, he directed a blister to be applied between the shoulders; the whole length of the spine, and jaw, to be anointed with the *oleum lateritium*; and a purge, consisting of the *tinctura sacra jalapini* and the *syrupus de rhanno cathartico*, to be given him. This was repeated three several times afterwards, at the distance of three or four days between each dose. On the intermediate days, he was ordered the *oleum succini*,

the fetid gum, and the *oleum amygdalinum*. Of the first he took 30 drops, of the gum 20 grains, and of the last four ounces, in *nycthemeri spatio*. By these means, and these only, the convulsions soon ceased, and he grew daily better and better, till at the end of a fortnight he was able to walk about his room, and in less than three weeks became in all respects well, some small weakness in the parts only excepted. The jaw was relieved first, after that the spine, and last of all the legs. A pain and uneasiness in the places affected, neither of which he had felt before, were the forerunners of his approaching amendment.

From all this it seems reasonable to conclude, either that there is no certain remedy for tetanus in all cases, or that the medicines which prove effectual in one constitution will fail in another. Thus, it is possible, that in cases where opium proves ineffectual, mercury may be a remedy; and on the contrary, where mercury fails, opium may be effectual; and even where both are ineffectual, the antispasmodics recommended by Dr Carter may be of use. It is therefore necessary for physicians to be extremely careful to observe the effects of the first doses of their remedies: for if the symptoms shew not the least appearance of remission after a large dose of opium, it is improbable that it can be cured by a repetition of the medicine; and as no time can be lost with safety, it will then be proper to apply mercurial ointment, or whatever else may be judged proper.—In the Medical Commentaries indeed we have an account of the cold bath being used as a remedy, by Thomas Cochran surgeon at Nevis. The patient was an East Indian boy who had been gored by a cow and afterwards exposed to a rainy damp air for some hours. Mr Cochran ascribes his cure to the cold bath, which was applied by dashing the water upon his body. But as the patient at the same time got laudanum at first in the quantity of 200 drops a-day, and afterwards in still larger doses; and had besides his throat and shoulders anointed with warm oil of turpentine, was bled, and had lenient glysters and laxatives; it is by no means easy to say what share the cold bath had in his cure, or whether it had any at all. Mr Cochran, however, says he has heard of some cases being treated successfully by cold water and the bark in St Eustatia and St Kitts, and in another letter mentions his having used the cold bath in other cases of tetanus with success. This remedy is now also used by some English physicians.

#### GENUS XLIX. TRISMUS, or the LOCKED JAW.

Trismus, *Sauv. gen.* 117. *Lin.* 124. *Sag. gen.* 223. *Capitulum, Veg.* 208.

#### CXV. The Locked Jaw in Children under two months old. Sp. I.

Trismus nascentium, *Sauv. sp.* 1. *Heister Comp. Med. Pract. cap. xv. § 10. Clegborn on the Diseases of Minorca, Introd. p. 33. Heiser in Act. Helvet. tom. i. p. 65.*

This distemper is so closely connected with the tetanus, that it ought rather to be accounted a symptom of the tetanus than a primary disease. The trismus of young



PRACTICE young children we have accordingly discussed under TETANUS.

XXVIII. CHOREA, or ST VITUS'S DANCE.  
Genus LI.

PRACTICE

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- 389 CXVI. The TRISMUS from Wounds or Cold. Sp. II.  
Trismus traumaticus, *Sauv.* sp. 2. *Lond. Med. Obj.*  
Vol. I. art. 1. 7. Vol. II. 34. Vol. III. 31.  
Vol. IV. 7.  
Angina spasmodica, *Sauv.* sp. 18. *Zwingeri Act.*  
*Helvet. Tom. III.* p. 319.  
Convulsio a nervi punctura, *Sauv.* sp. 2.  
Trismus catarrhalis, *Sauv.* sp. 15. *Hillari's Barba-*  
*does,* 221. *Lond. Med. Obj.* Vol. IV. 7.

The internal remedies proper in all cases of the locked jaw, from whatever cause it may proceed, have been already mentioned under TETANUS: the external treatment of wounded parts which may give occasion to it belongs to the article SURGERY.

CXVII. CONVULSION. Genus L.

- 390 Convulsio, *Sauv.* gen. 128. *Lin.* 142. *Vog.* 191.  
*Sag.* gen. 235.  
Convulsio universalis, *Sauv.* sp. 11.  
Hicranosus, *Lin.* 144. *Vog.* 190.  
Convulsio habitualis, *Sauv.* sp. 12.  
Convulsio intermittens, *Sauv.* sp. 16.  
Convulsio hemitonicus, *Sauv.* sp. 15.  
Convulsio abdominalis, *Sauv.* sp. 10.  
Convulsio ab inanitione, *Sauv.* sp. 1.  
Convulsio ab onanismo, *Sauv.* sp. 13.  
Scelotyrbe festinans, *Sauv.* sp. 2.

*Description.* When convulsions attack only particular parts of the body, they are generally attended with some kind of paralysis at the same time, by which means the affected parts are alternately convulsed and relaxed; a permanent convulsion, or unnatural contraction, of particular muscles, is called a *spasmus*, or *cramp*. These partial convulsions may attack almost any part of the body; and are not infrequently symptomatic, in fevers, the cholera morbus, &c. The involuntary startings of the tendons, the picking of the bed-clothes, &c. in acute diseases, &c. are all of them convulsive disorders.

*Causes.* Convulsions, not only of particular parts, but also over the whole body, often take place from causes not very evident. Sometimes they seem to depend on a certain delicacy or irritability of the nervous system, which is framed with such exquisite sensibility as to be strongly affected by the slightest causes. Delicate women are often subject to hysterical convulsions, as also hypochondriac people. Convulsions, however, often take their rise from wounds, irritations of the stomach and intestines by worms, poisons, violent cathartics and emetics, &c.; and very often they are symptomatic, as in dentition, the small-pox, and many kinds of fevers.

*Prognosis.* Except in some few cases, convulsive disorders are always to be dreaded; but less in young people than in such as are advanced in life. Those which attack girls under the age of puberty will generally cease on the appearance of the menses; and boys have likewise a chance of being relieved as they advance in life: but in grown up people, unless the cause is very evident, a cure is hardly to be expected.

*Cure.* See EPILEPSY, below.

- Scelotyrbe, *Sauv.* gen. 136. *Sag.* 243.  
Chorea, *Lin.* 139.  
Scelotyrbe chorea Viti, *Sauv.* sp. 1.  
Chorea St. Viti, *Sydenh. Sched. Monit.*

*Description.* This disease shews itself first by a kind of lameness or infatigability of one of the legs, which the patients draw after them in a ridiculous manner: nor can they hold the arm of the same side still for a moment; for if they lay it on their breast, or any other part of their body, it is immediately forced away by a convulsive motion. If they are desirous of drinking, they use a number of odd gesticulations before they can bring the cup to their mouths, because their arms are drawn this way and that by the convulsions which affect them.

*Causes, &c.* The general cause of St Vitus's dance is a debility of the system; and hence we find it attacks only weakly boys, and more especially girls, when under the age of puberty. But the particular causes determining the muscles to be affected in such and such a manner are entirely unknown.

*Prognosis.* As this disorder scarce ever attacks any persons but such as are under the age of puberty, there is almost a certain prospect of its being then cured, tho' generally the disorder is easily removed before that time.

*Cure.* See EPILEPSY.

CXIX. RAPHANIA. Genus LII.

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- Raphania, *Lin.* 155. *Vog.* 143. *Lin. Amoen. Acad.*  
Vol. VI.  
Convulsio raphania, *Sauv.* sp. 7.  
Eclampsia typhodes, *Sauv.* sp. 1. *Sennert de febr.*  
l. iv. cap. 16. *Gregor. Horst. Oper. tom. II. l. viii.*  
obs. 22. *Brunner in Ephem. Germ. D. iii. A. ii.*  
obs. 224. *Willisch. ibid. cent. vii. obs. 13. Wepfer*  
*de Affect. Capitis,* obs. 120. *Breslauer Samm-*  
*lung* 1717, Julio, Septembri, & Decembr. *Ibid.*  
1723, Januar. A. N. C. Vol. VII. obs. 41.  
*Bruckmann. Com. Norimb.* 1743, p. 50.

*Description.* According to Sauvages, this distemper begins with a lassitude of the limbs, transient colds and shiverings, pain of the head, and anxieties of the præcordia. Then come on spasmodic startings of the fingers and feet; also of the tendons and muscles, conspicuous below the skin. The disease is attended with heat, fever, delirium, stupor, constriction of the breast, suffocating dyspnoea, loss of voice, horrid convulsions of the limbs, preceded by a formication, or sensation as of ants or other small insects creeping on the parts. In this state of the disease, the convulsive paroxysms are attended with most violent pains in the limbs, vomiting, or diarrhea, with the passing of worms, thirst, and in young people an unnatural hunger. It continues from ten days to three months. About the eleventh or twentieth day, some are relieved by copious sweats, or purple exanthemata; while others fall into a tabes, with stupor, or stiffness of the joints.

*Causes, &c.* This disease is frequently epidemic in Suabia and other parts of Germany; where it is said to be produced by seeds of radishes, which are often mixed with rye in that country; and from this supposed cause

**PRACTICE** cause the disease takes its name.  
Cure. See EPILEPSY.

**GENUS LIII. EPILEPSY, or FALLING-SICKNESS.**

Epilepsia, *Sauv.* gen. 134. *Lin.* 143. *Vog.* 188.  
*Sag.* gen. 24. *Boerb.* 1071. *Hoffm.* III. 9. *Junc.*  
54.  
Eclampsia, *Sauv.* gen. 133. 180. *Sag.* gen. 240.

393 **CXX. The CEREBRALIS, or Epilepsy depending on an affection of Brain. Sp. I.**

Epilepsia plethorica, *Sauv.* sp. 1.  
Eclampsia plethorica, *Sauv.* sp. 7.  
Epilepsia cachectica, *Sauv.* sp. 2.?

394 **CXXI. The SYMPATHICA, or Sympathetic Epilepsy, with a sensation of something rising from a certain part of the body towards the Head. Sp. II.**

Epilepsia sympathica, *Sauv.* sp. 8.  
Epilepsia peditymptomatica, *Sauv.* sp. 6.

395 **CXXII. The OCCASIONALIS, or Epilepsy arising from various irritating Causes. Sp. II.**

Epilepsia traumatica, *Sauv.* sp. 13.  
Eclampsia traumatica, *Sauv.* sp. 9.  
Epilepsia a dolore, *Sauv.* sp. 10.  
Epilepsia rachialgica, *Sauv.* sp. 14.  
Eclampsia a doloribus, *Sauv.* sp. 4.  
a. Rachialgica.  
b. Ab otalgia.  
c. A dentitione.

Eclampsia parturientium, *Sauv.* sp. 3.  
Eclampsia verminosa, *Sauv.* sp. 2.  
Eclampsia ab atropa, *Sauv.* sp. 11.  
Eclampsia ab ænanthe, *Sauv.* sp. 12.  
Eclampsia a cicuta, *Sauv.* sp. 13.  
Eclampsia a coriaria, *Sauv.* sp. 14.  
Epilepsia exanthematica, *Sauv.* sp. 11.  
Epilepsia cachectica, *Sauv.* sp. 2.  
Epilepsia stomachica, *Sauv.* sp. 3.  
Eclampsia a saburra, *Sauv.* sp. 5.  
Epilepsia a pathemate, *Sauv.* sp. 7.  
Eclampsia ab inanitione, *Sauv.* sp. 8.  
Epilepsia neophytorum, *Sauv.* sp. 15.

**Description.** The epilepsy often attacks suddenly, and without giving any warning; but more frequently is preceded by a pain in the head, lassitude, some disturbance of the senses, unquiet sleep, unusual dread, dimness of sight, a noise in the ears, palpitation of the heart, coldness of the joints, and in some there is a sensation of formication, or a cold air, &c. ascending from the lower extremities towards the head. In the fit, the persons fall suddenly to the ground (whence the name of the *falling-sickness*), frequently with a violent cry. The thumbs are shut up close in the palms of the hands, and are with difficulty taken out; the eyes are distorted, so that nothing but the whites are to be seen; all sensation is suspended, inasmuch, that by no smell, noise, or otherwise, nor even by pinching the body, can they be brought to themselves; they froth at the mouth, with a hissing kind of noise; the tongue is frequently lacerated by the teeth, and there is a violent convulsive motion of the arms and legs. Sometimes, however, the limbs, instead of being agitated by

convulsive motions, are all stiff, and the patients are as immovable as a statue. In children the penis is erected; and in young men there is an emission of the semen, and the urine is often thrown out to a considerable distance. At length there is a remission of the symptoms, and the patients recover after a longer or shorter interval; when they complain of a pain, torpor, and heaviness of the head, with a lassitude of all the joints.

**Causes, &c.** The dissection of epileptic subjects has shewn a variety of morbid appearances, which may be supposed to have contributed to the disease; such as, indurations in the brain or meninges; caries of the internal surface of the cranium; projections of the bony substance of the same, pressing upon the brain; collections of serum or purulent matter, and earthy concretions within the skull; besides many others which are recorded by Bonetus, Morgagni, and Lieutaud. But often the causes are impossible to be discovered; for even in those who have died of the disease, the brain and all other parts of the nervous system have been apparently found. The disease will attack strong as well as weak people; and in those who are subject to it, any considerable excess in drinking, a surfeit, violent passion, or venery, &c. will certainly bring on a fit. Some have epileptic paroxysms returning periodically after considerable intervals; and the disease hath been thought to have some dependence on the phases of the moon.

**Pægnosis.** If the epilepsy comes on before the time of puberty, there are some hopes of its going off at that time. But it is a bad sign when it attacks about the 21st year, and still worse if the fits grow more frequent; for then the animal-functions are often destroyed, as well as those of the mind, and the patient becomes stupid and foolish. Sometimes it will terminate in melancholy or madness, and sometimes in a mortal apoplexy or palsy. It hath sometimes, however, been observed, that epilepsies have been removed by the appearance of cutaneous diseases, as the itch, small-pox, measles, &c. While the disease is recent, therefore, we are not to despair of a cure; but if it is of long standing, or hereditary, there is very little reason to expect that it can be removed.

**Cure.** In all convulsive disorders, excepting those which are cured by nature about the time of puberty, the cure by artificial means is very difficult. Numberless specifics have been recommended, but all of them have failed of answering the expectation. When the cause can be discovered, that must be removed. In other cases, the cold bath, valerian root, castor, musk, opium, the fœtid gums, Peruvian bark, with the whole tribe of nervous and antispasmodic medicines, have been recommended: but none of these, or indeed any combination of them, have been found generally useful; though the slightest, or symptomatic cases, may often be removed by them.

Of late the *calx*, improperly called the *flowers*, of zinc, have obtained such reputation in convulsive disorders as to be received into the Edinburgh dispensatory. They were proposed by Dr Gaubius as an antispasmodic, in his *Adversaria*; and their efficacy hath since been confirmed by various observations. In an inaugural dissertation published by Dr Hart at Leyden, the medical virtues of the flowers of zinc are considered. He observes, that they have long been used externally, chiefly for inflam-

mations

mations of the eyes from acrid lymph. Glauber first propounded the internal use of them; and Gaubius discovered them to be the remedy of the celebrated empiric Luddemannus, under the title of *luna fixata*. After this he exhibited them with success in convulsive and spasmodic diseases. Our author supposes, that they act either as absorbents, or as possessing a specific virtue: but is a strong advocate for their efficacy, on whatever principles they may operate; and, in favour of his opinion, relates seven cases in which they proved successful. A girl of 17 was seized with a slight *chorea* from a fright; and when the disease had continued six days, began to take the flowers of zinc, by which her disorder was removed in less than three weeks. Her cure required only 16 grains of the calx. In a few months the complaints returned, from the same cause; and were removed by four grains of the medicine divided into ten doses.—A boy of about four years old, labouring under a real epilepsy, suspected to be hereditary, was cured by a grain of the flowers of zinc taken every day for some time.—A man 50 years old, thrown into convulsions from a violent passion, was cured by a grain of the calx taken every two hours. The disease had gone off upon venesection and the use of some other remedies; but returned again in two weeks, when it was finally removed by the zinc.—The two last cases are related from Dr Gaubius, who affirms that he has used the flowers of zinc in cases of the chinquough, hyteric hiccough, and spasms cynicus; that they frequently did more than other medicines, but were by no means successful in every case. The other cures mentioned by Dr Hart are similar to those above-mentioned, and it does not appear that he ever saw a confirmed epilepsy cured by this medicine.

In the first volume of *Edin. Medical Commentaries*, p. 204, we have an account by Mr Benjamin Bell, of a man afflicted with a confirmed epilepsy, who was considerably relieved by the flowers of zinc. He was about 35 years of age, and had been subject to the disease for 10 years. At first the paroxysms did not return oftener than once a month: but becoming gradually more frequent, they came at last to be in a manner continual, inasmuch that he would have ten, eleven, or twelve attacks in a day, and very seldom had an interval of 24 hours. His memory and judgment were so much impaired, that he could scarce answer a question distinctly, though he had used a great variety of medicines. About three years before applying to Mr Bell, he had violent rheumatic pains in his limbs, which left such an extreme debility that he was never afterwards able to get out of bed without the assistance of two or three people.

On the 22d of October 1772, Mr Bell found him in the above-mentioned condition, and prescribed as follows:

*B. Flor. Zinc. gr. xxiv.*

*Ext. Gent. 3i. M. f. mass. et divid. in pil. xxiv. cap. i. m. & v.*

He continued to take two pills a-day till the first of November, without any sensible benefit. The dose was then doubled, and continued till the 12th; when the fits, though equally violent, became less frequent. The medicine was gradually augmented to ten pills thrice a-day; and the consequence was, that his memory and understanding returned, the fits became much lighter

and less frequently repeated, though the disease could not be radically subdued.

In a young man labouring under the epilepsy, in whom the fits were preceded by an *aura epileptica*, or sensation like air arising from the inside of the knee-joint, the disease was also relieved, but not cured.

Dr Percival relates some cases of epilepsy which seem to have been cured by the flowers of zinc; and in other cases, where the disease was not entirely removed by it, the spasms were nevertheless much mitigated. He did not observe that it promoted any evacuation; except that in some, upon being first taken, it occasioned a little sickness, which went off with a stool. He adds, that those apothecaries who do not prepare this medicine themselves, are in great danger of being imposed upon, as it is sometimes a mere corrosion of the zinc by an acid, and even imperfectly washed.

The good effects of flowers of zinc as an antispasmodic are also attested by Dr Hargrath of Chester and Dr White of York. The former gives a test of their goodness which may be of use to those who do not prepare them, namely, that the true flowers of zinc when strongly heated become yellow, but reassume their white colour on being allowed to cool. The latter gives a case of hieranosis, or strange convulsions of almost all the muscles of the body, cured by zinc, after a number of other remedies had failed. The patient, however, had been formerly much relieved by Ward's antimonial pill.

In Dr Home's clinical experiments and histories, also, the flowers of zinc are mentioned as having been found serviceable upon trial in the Royal Infirmary of Edinburgh. Of the other principal remedies which have been recommended for the epilepsy and other convulsive disorders allied to it, we have the following account by the same author.

1. *The cold-bath* was tried in one who had a convulsive disorder of one side, but the symptoms were rendered much worse by it.

2. *Venesection*. Not to be depended on in convulsions.

3. *Electricity*. In two convulsive cases this was of no service. See the section on *Electricity*, below.

4. *Epilepsics*. Do not seem to be powerful antispasmodics.

5. *Valerian*. In nine convulsive cases, for which this remedy hath been reckoned almost a specific, it not only made no cure, but could scarcely be reckoned to do any good. Dr Home supposes that it acts as a bitter tonic, something like the *Serpentaria Virginiana*. "Tho' much used at present, (says he), it has always appeared to me a weak, often a hurtful, medicine."

6. *Musk*. Six convulsive patients treated with large doses of this remedy, were neither cured nor in the least relieved.

7. *Caster* seems to be unworthy of the confidence formerly put in it. It is indeed possessed of a sedative power, and therefore may be useful in spasmodic febrile cases.

8. *Asafatida* hath considerable antispasmodic powers, but is not always successful. It heats and quickens the pulse; and is therefore improper in cases attended with inflammation. It disagrees with some from a peculiarity of constitution; exciting pain in the stomach, and vomiting; but this can be known only after



after the exhibition of the medicine.

9. *Cortex Peruvianus*. Of seven spasmodic cases, six were either cured or mitigated. An epilepsy of eight years standing was very much relieved by taking the bark for a month, and one of two years standing by taking it for ten days. But the medicine is of a heating nature, and therefore is not to be employed in cases attended with inflammatory symptoms.

10. *Pony-root* was given to two epileptic patients without the least success.

11. *Viscus quercinus*, or mistletoe, was given in the quantity of two scruples five times a-day to an epileptic patient, without success.

12. *Extractum hyssicami*, was given to an epileptic patient, to one afflicted with the hemitonus, and to one who laboured under the hysterical affection, without the least good effect.

13. *Folia aurantiorum*, were exhibited with the like bad success. Five drachms of the powdered leaves were taken at once without any sensible effect.

14. *Cardamine pratensis*, in three epileptic cases was not attended with any success.

15. *Opium*, did no good.

16. *Cuprum ammoniacale*, made no cure in four cases of epilepsy in which it was tried.

#### GENUS LIV. PALPITATIO, PALPITATION OF THE HEART.

Palpitatio, *Sauv. gen.* 130. *Lin.* 132. *Vog.* 213.  
*Sag.* 237. *Hoffm.* III. 83. *Junc.* 33.

THE palpitation of the heart is sometimes so violent, that it may be heard at a considerable distance. It may proceed from a bad conformation of the heart itself, or some of the large vessels. It may also be occasioned by wounds or abscesses in the heart; or it may proceed from polypous concretions or ossifications of that viscus, or from plethora, fear, or spasmodic affections of the nervous system. When it proceeds from diseases of the heart or large vessels, it is absolutely incurable. In spasmodic cases, the remedies above-related may be used. If the patient is plethoric, bleeding will probably remove the disorder, at least for the present.

#### GENUS LV. ASTHMA.

Asthma, *Sauv. gen.* 145. *Lin.* 161. *Vog.* 268.  
*Sag.* gen. 282.

Asthma convulsivum et spasmodica flatulentum,  
*Hoffm.* III. 94.

Asthma spasticum, *Junc.* tab. 51.

#### CXXII. The Spontaneous ASTHMA. Sp. I.

Asthma humidum, *Sauv. sp.* 1. Flatulentum, *Floyer*  
on the Asthma, chap. i.

Asthma convulsivum, *Sauv. sp.* 2. *Willis Pharm.*  
rat. P. II. sect. i. cap. 12.

Asthma hystericum, *Sauv. sp.* 3. *Floyer* on the  
Asthma, chap. i.

Asthma stomachicum, *Sauv. sp.* 8. *Floyer*, Scheme  
of the Species of Asthma. Periodic Asthma 6.

Orthopnea spasmodica, *Sauv. sp.* 3.

Orthopnea hysterica, *Sauv. sp.* 4.

#### CXXIII. The Exanthematic ASTHMA. Sp. II.

Asthma exanthematicum, *Sauv. sp.* 11.

Asthma cachecticum, *Sauv. sp.* 13.

#### CXXIV. The Plethoric ASTHMA. Sp. III.

Asthma plethoricum, *Sauv. sp.* 15.

THE asthma is a chronic disease, which may continue to give very great distress, at intervals, for a considerable number of years. Sir John Floyer, when he wrote his celebrated treatise, had laboured under repeated paroxysms for 30 years.

The common distinction is into *humid* and *dry*; the former is accompanied with an expectoration of mucus or purulent matter, but the latter is not so attended. In the genuine humoral asthma, the patients are obliged to lean forward; the inspiration is short and spasmodic; and the expiration very slow.

Asthmatic persons have generally some warning of the attack, from a languor, loss of appetite, oppression, and swelling of the stomach from flatulence, which precede the fit, but it is usually in the middle of the night, that the violent difficulty of breathing comes on.

The duration of the paroxysm is uncertain, as it will sometimes terminate in three or four hours, while at other times it shall continue for as many days; nay, it has been known to last three weeks without intermission. While it subsists, the patient is in very great distress, not being able to lie in bed, nor scarcely to speak or expectorate, so great is the difficulty of breathing; and yet, notwithstanding all this apparent interruption to the free passage of the blood through the lungs, an inflammation here seldom or never supervenes a fit of the asthma. As the paroxysm wears off, and the breathing becomes free, there is more or less of an expectoration of mucus; and the urine, from being pale and limpid, becomes high-coloured, and lets fall a copious sediment.

In order to obtain relief in the fit, we must sometimes bleed, unless extreme weakness or old age should forbid, and repeat it according to the degrees of strength and fulness; a purging clyster, with a solution of asafœtida, must be immediately injected; and if the violence of the symptoms should not speedily abate, it will be proper to blister the nape of the neck.

In the height of the paroxysm, an emetic might be followed by dangerous symptoms, as it would increase the accumulation of blood in the vessels of the head; but vomiting will often prevent a fit of the asthma, especially if the stomach should chance to be loaded with any sort of saburra. A very strong infusion of roasted coffee has been found to give ease in an asthmatic paroxysm.

Dr Pringle says it is the best abater of the paroxysms of the periodic asthma that he has seen. The coffee ought to be of the best Mocco, newly burnt, and made very strong immediately after grinding it. He commonly ordered an ounce for one dish; which is to be repeated fresh after the interval of a quarter, or half an hour; and which is to be taken without milk or sugar. The medicine in general is mentioned by Musgrave in his treatise *de Arthritide anomala*; but he first heard of it from a physician in Litchfield, who had been in-

formed

formed by the old people of that place, that Sir John Floyer, during the latter part of his life, kept free from, or at least lived easy under his asthma, from the use of very strong coffee. This discovery, it seems, he made after the publication of his book upon that disease. Dr Percival says he has frequently directed coffee in the asthma with great success.

In the intervals of the fits, persons subject to the asthma, especially the humid species, should take emetics from time to time. An infusion of tobacco is an emetic that has been found very serviceable in some asthmatic cases; and smoking or chewing the same has been known to prevent the frequency and severity of the paroxysms. They should also use the lac ammoniaci, with a due proportion of *oxymel scilliticum* and *vinum antimoniale*, with a view to promote expectoration; or the gum ammoniac, and others of similar virtues, may be formed into pills, and combined with soap, as beforementioned for the dyspnoea pituitosa; or a mals may be composed of alafetida and balsam of Tolu, with *syr. ex allio*; and these pills may be washed down by a medicated wine, impregnated with squills, horse-radish root, and mustard-seed; or a strong bitter infusion, with a little antimonial wine.

In some cases crude mercury will be found serviceable; in others flowers of sulphur, made into an electuary with honey or syrup of garlic; and if, notwithstanding the use of these things, a costive habit should prevail, it will be necessary, from time to time, to give a few grains of the *pil. Ruffi*, soap and aloes, or a mals of equal parts of rhubarb, scammony, and soap.

The dry or *spasmodic asthma*, during the extreme violence of the fit, is best relieved by opiates; and sometimes very large doses are required. But, in order to obtain permanent relief, nothing is found to answer better than the *radix ipecacuanha*, in small doses. Three, five, eight or ten grains, according to the strength and constitution of the patient, given every other day, have been productive of the happiest effects; acting sometimes as an evacuant, pumping up the viscid phlegm; at others, as an antispasmodic or sedative. Issues are generally recommended in both species, and will often be found useful.

Changes of weather are usually felt very sensibly by asthmatic people, who in general cannot live with tolerable ease in the atmosphere of large cities; though we shall sometimes meet with patients who agree better with this air, which is so replete with gross effluvia of various kinds, than with the purest that can be found in country situations. And some are found who breathe with the most ease in a crowded room, with a fire and candles.

A light diet of meats that are easy of digestion, and not stultent, is requisite for asthmatic people; and the exercise of riding is indispensably necessary.

When the asthma is found to depend on some other disease, whether it be the gout or an intermittent fever, or when it proceeds from the striking in of some cutaneous eruption, regard must always be had to the primary disease: thus, in the *asthma arthriticum*, si-napisms to the feet, or blistering, will be absolutely necessary, in order, if possible, to bring on a fit of the gout. And when the dregs of an ague give rise to an asthma, which is termed *febriculofum*, and invades at

regular intervals, we must have recourse to the cortex. The *asthma exanthematicum* will require blisters or issues, to give vent to the acrid matters which were repelled from the surface of the body; and courses of sulphureous waters, goat's whey, and sweetening diet-drinks, or perhaps mercurial alteratives, in order to correct the sharpness of the juices.

#### GENUS LVI. DYSPNOEA, or Habitual Difficulty of Breathing.

Dyspnoea, *Sauv. gen.* 144. *Lin.* 160. *Vog.* 267. *Sag.* 251. *Junc.* 32.

CXXV. The Catarrhal DYSPNOEA. Sp. I. 399

Asthma catarrhale, *Sauv. sp.* 16.

Asthma pneumonicum, *Willis Pharm. Pat.* P. II. sect. i. cap. 12.

Asthma pituitosum, *Hoffm.* III. sect. ii. cap. 2. § 3.

Asthma pneumodes, *Sauv. sp.* 17.

This is readily known by the symptoms of pneumonia and catarrh attending it, and towards the removal of these symptoms the care of the physician must be principally directed.

CXXVI. The Dry DYSPNOEA. Sp. II.

Dyspnoea a tuberculis, a hydatibus, &c. *Sauv. sp.* 2. 400  
4. 5. 20.

Orthopnoea a lipomate, *Sauv. sp.* 18.

This is generally accompanied with a phthisis pulmonalis; but Sauvages mentions one species of phthisis to which the dry dyspnoea seems more particularly to belong. The patients fall away by degrees, and have a great difficulty of breathing, continual thirst, and little or no spitting. When opened after death, their lungs are found not to be ulcerated, but shrivelled and contracted as if they had been smoke-dried. Goldsmiths and chemists are said to be subject to this disease by reason of the vapours they draw in with their breath. Our author doth not mention any particular remedy. Shortness of breath arising from *tubercles*, as they are termed, or a scirrhous enlargement of the lymphatic glands which are dispersed through the lungs, is commonly found in scrofulous habits, and may be distinguished by the concomitancy of those external swellings and appearances which particularly mark the scrofula. This species of dyspnoea generally ends in a phthisis. Courses of goat's whey, and of sea-water, have been known to do service; but it must be confessed, that a perfect cure is seldom obtained. Issues are of use in these cases, as they appear to prevent the ill effects of an over-sfulness, if it should happen at any time to supervene.

CXXVII. DYSPNOEA from Changes in the Weather. 401  
Sp. III. (*Sauv. sp.* 12.)

This seems to be a disease entirely spasmodic, and the antispasmodics already related are accordingly indicated.

CXXVIII. The DYSPNOEA from Earthy Substances 402  
formed in the Lungs. Sp. IV.

Sauvages mentions this disease as much more common in brutes than in the human race: but Dr Cullen mentions his having seen some instances of it; and we have

have several accounts by different authors of calculous matters being coughed up by people labouring under a dyspnoea, and threatened with consumption. In three cases of this kind which fell under Dr Cullen's inspection, there was no appearance of earthy or stony concretions in any other part of the body. The calcareous matter was coughed up frequently with a little blood, sometimes with mucus only, and sometimes with pus. In one of these cases, an exquisitely formed phthisis came on, and proved mortal: in the other two the symptoms of phthisis were never fully formed; and after some time, merely by a milk-diet and avoiding irritation, the patients entirely recovered.

Sauvages also greatly recommends milk in these cases, and soap for dissolving the concretions. The reason why brutes are more subject to these pulmonary calculi than mankind, is, that they very seldom cough, and thus the stagnating mucus or lymph concretes into a kind of gypseous matter.

#### 403 CXXIX. The Watery DYSPNOEA. Sp. V.

Dyspnoea pituitosa, *Sauv.* sp. 1.

Orthopnoea ab hydropneumonia, *Sauv.* sp. 12.

This may arise from too great a defluxion of mucus on the lungs, or from an effusion of serum, as is mentioned under the pneumonia. The treatment of the disease may be gathered from what has been already said under the heads of pneumonia, catarrh, empyema, &c.

#### 404 CXXX. The DYSPNOEA from Corpulency. Sp. VI.

Orthopnoea a pinguedine, *Sauv.* sp. 6.

There have been many instances of suffocation and death occasioned by too great corpulency. These fatal effects, however, may be almost always avoided if the persons have resolution to persist in an active and very temperate course of life; avoiding animal-food, much sleep, and using a great deal of exercise. In the third volume of the Medical observations, however, there is an extraordinary instance of internal obesity which neither shewed itself externally, nor could be removed by any medicines.

Other species of dyspnoea have been treated under PHTHISIS. It is frequently symptomatic of diseases of the heart and large vessels, or swellings of the abdomen, &c.

#### 405 CXXXI. PERTUSSIS, the CHINCOUGH.

Genus LVII.

Pertussis Sydenham, *Ed. Leid.* p. 200. 311. 312.

*Huxham* de acre, *ad. ann.* 1732.

Tussis convulsiva, five ferina, *Hoffm.* III. 111.

Tussis ferina, *Sauv.* sp. 10. *Sag.* sp. 10.

Tussis convulsiva, *Sauv.* sp. 11. *Sag.* sp. 11.

Amphimerina tussiculosa, *Sauv.* sp. 13.

*Description.* This disease comes on at first like a common cold; but is from the beginning attended with a greater degree of dyspnoea than is common in that disease; and there is a remarkable affection of the eyes, as if they were swelled, and a little pushed out of their sockets. By degrees the fits of coughing become longer and more violent, till at last they are plainly convulsive, so that for a considerable time the patient cannot respire, and when at last he recovers his breath,

inspiration is performed with a shrill kind of noise like the crowing of a cock. This kind of inspiration serves only as an introduction to another convulsive fit of coughing, which is in like manner followed by another inspiration of the same kind; and thus it continues for some time, very often till the patient vomits, which puts an end to the paroxysm at that time. These paroxysms are attended with a violent determination of the blood towards the head, so that the vessels become extremely turgid, and blood not unfrequently flows from the mouth and nose. The disease is tedious, and often continues for many months. It is not commonly attended with fever.

*Causes, &c.* The chincough is an infectious disorder, and very often epidemic; but the nature of the contagion is not understood. It generally attacks children, or adults of a lax habit, making its attack generally in the spring or autumn; and those children who live upon unwholesome watery food, or breathe unwholesome air, are most liable to its attacks, and suffer most from them. In general it may be concluded, that whatever weakens the solids, or tends to bring on a dissolution of the fluids, predisposes to this disease.

*Prognosis.* The chincough is not very often fatal. In children under two years of age it is most dangerous; and kills them by producing convulsions, suffocation, inflammation, and suppuration of the brain, ruptures, and incurvation of the spine. In pregnant women it will produce abortion; and, in adults, inflammations of the lungs, and all the consequences of pneumonia, more frequently than in children. From a long continuance of the disease patients will become asthmatic, ricketty, and scrophulous. It is generally reckoned a good sign when a fit terminates by vomiting; for in this disease there seems to be a prodigious increase of the secretion of mucus, and the vomiting affords great relief.

*Cure.* The most approved remedies in this disease are vomits, purges, bleeding, and the attenuating pectorals, for the other kinds generally do hurt. But large evacuations of any kind are pernicious. In the Medical Observations, Vol. III. Dr Morris recommends castor and the bark; but in cases attended with any degree of inflammation, the latter must certainly do hurt, and the former will generally be insignificant. Dr Butler, in a dissertation expressly on the subject, instances 20 cases of it cured by the extract of hemlock. He directs half a grain a-day for a child under six months old; one grain for a child from six months to two years; afterwards allowing half a grain for every year of the patient's age till he be 20: beyond that period, he directs ten grains to be given for the first day's consumption, gradually increasing the dose according to the effect. If the patient has not two stools a-day, he advises magnesia or polychrest salt to be added to the hemlock mixture. By this method he says the peculiar symptoms of the disease are removed in the space of a week; nothing but a slight cough remaining. The use of hemlock, however, hath by no means become universal in consequence of this publication, nor indeed is the remedy at present much used in cases of chincough or any other disease. The remedy most to be depended upon in this disease is change of air. The patient, as soon



as the disease is fully formed, ought to remove to some other part of the country; but there is no occasion for going to a distant place; a mile or two, or frequently a smaller distance, will be sufficient; and in this new habitation he must remain till the disorder goes off, which it will generally do in a short time: tho' some recommend frequent changes of air and habitation. But it will not do to take the patient out daily, and return to his town-habitation at night. If the disease is attended with fever, bleeding and other antiphlogistic remedies are proper. Dr Buchan recommends an ointment made of equal parts of garlic and hog's lard applied to the soles of the feet. It ought to be put on a rag and applied like a plaster. Opiates may sometimes be useful, but in general are to be avoided.

#### CCXXXII. PYROSIS, the HEART-BURN. GENUS LVIII.

Pyrosis, *Sauv. gen.* 200. *Sag.* 158.

Soda, *Lin.* 47. *Vog.* 154.

Scotti, the WATER-BRASH.

Pyrosis Suecica, *Sauv. sp.* 4.

Cardialgia sputatoria, *Sauv. sp.* 5.

This disease, whether considered as primary or symptomatic, hath already been fully treated under DYSPEPSIA.

#### GENUS LIX. COLICA. The COLIC.

Colica, *Sauv. gen.* 204. *Lin.* 50. *Vog.* 160. *Sag.* 162. *Junc.* 106.

Colica spasmodica et flatulenta, *Hoffm.* II. 284.

Rachialgia, *Sauv. gen.* 211. *Sag.* 168.

Ileus, *Sauv. gen.* 252. *Vog.* 162. *Sag. gen.* 187.

Iliaca, *Lin.* 185.

Dolor et spasmus iliacus, *Hoffm.* II. 263.

Passio iliaca, *Junc.* 107.

#### CCXXXIII. The Spasmodic COLIC. Sp. I.

Colica flatulenta, pituitosa, &c. *Sauv. sp.* 1. 2. 5.

6. 7. Ileus phlyodes, volvulus, inflammatorius,

&c. *Ejusd.* sp. 1. 3. 5. 7. 8. 9.

*Description.* THE colic is chiefly known by a violent pain in the abdomen, commonly about the umbilical region. The pain resembles various kinds of sensations, as of burning, twisting, boring, a ligature drawn very tight, &c. The belly is generally coltive, though sometimes there is a violent evacuation of bilious matters upwards and downwards. In these cases the disease is sometimes accompanied from the beginning with a weak and intermitting pulse, cold sweats, and fainting. In some the disease comes on gradually, beginning with an habitual costiveness; and if purgatives are taken, they do not operate. The pain comes on generally after a meal, and soon occasions nausea and vomiting. Sometimes the disease is attended with pyrexia, violent thirst, and a full pulse; the vomiting becomes more violent, and excrementitious matters are thrown up with the most exquisite pain and tension of the abdomen; an hiccup comes on, which continues obstinately; till at last a cessation of pain and foetid breath indicates a mortification of the intestines,

and approaching death. Sometimes the peristaltic motion of the intestines is so totally inverted, that all the contents of the intestines are evacuated by the mouth, and even clysters will be vomited; which constitutes that disease commonly called the *iliac passion*.

*Cause, &c.* Colics may arise from any sudden check given to peristalsis, as by violent cold applied to any part of the body, especially to the lower extremities and abdomen. Very frequently they are occasioned by austere, acid, or indigestible aliments taken into the stomach. By any of these, a violent colic, or indeed an iliac passion, may be occasioned; for Dr Cullen justly observes, that this last, though commonly accounted a different species of disease, differs from a colic in no other way than in being in every respect in a much higher degree. In those who have died of this disease and been dissected, the gut hath sometimes been found twisted; but more commonly there hath been an *introsusception* of the intestine, that is, one part of the gut seems to have entered within the other. In the Edinburgh Medical Essays, Vol. III. we have a dissertation on the use of the warm bath in the bilious colic, in which the author derives the disorder from a spasmodic constriction of the intestine occasioned by the acrimony of the bile. By this, he says, the intestine is not only contracted into an unusual narrowness, but coats of it have been found, upon dissection, so closely joined, that no passage could be made downwards more than if they had been strongly tied by a ligature. The formation of the *introsusception* he explains by quoting a passage from Peyerus, who made the following experiment on a frog. Having irritated the intestine of the animal in several different places, he observed it to contract at those places most violently, and to protrude its contents upwards and downwards wherever the relaxed state of the part would permit; by which means the contents were heaped together in different parts. Hence some parts of the intestine being dilated much more than enough, by reason of the great quantity of matter thrown into them, formed a kind of sack which readily received the constricted part into it. If this happens in the human body, there is the greatest danger of a mortification, because the part which is constricted, and at any rate disposed to inflammation, hath that disposition very much increased by its confinement within the other, and by the pressure of the contents of the alimentary canal from the stomach downwards upon it. An iliac passion may also arise from the strangulation of part of the intestine in a hernia; and even a very small portion of it thus strangulated may occasion a fatal disease. In the Medical Observations, Vol. IV. however, we have an account of an iliac passion arising from a very different cause, which could neither have been suspected nor cured by any other way than the operation of *gastrotony*, or opening the abdomen of the patient, in order to remove the cause of the disorder. The patient, a woman of about 28 years of age, died after suffering extreme torture for six days. The body being opened, some quantity of a dirty coloured fluid was found in the cavity of the abdomen. The jejunum and ileon were greatly distended with air. A portion of the omentum adhered to the mesentery, near that part where the ileon terminates in the caecum.

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From this adhesion, which was close to the spine, there ran a ligamentous cord or process about two inches and a half long, unequally thick, in some places not thicker than a packthread; which by its other extremity adhered to the coats of the ileon, about two inches above the cæcum. This cord formed a circle with the mesentery, large enough to admit a hen's egg to pass through it. The chord had formed a noose (in a manner difficult to be explained), which included a doubling of about two inches of the lower end of the ileon; and was drawn so tight, that it not only put a stop to the passage of every thing through the bowels, and brought on a gangrene of the strangulated part, but it had even cut through all the coats of the intestine on the opposite side to the mesentery, and made an aperture about an inch long. In the Memoirs of the Academy of Surgery are mentioned several similar cases.

*Prognosis.* The colic is never to be reckoned void of danger, as it may unexpectedly terminate in an inflammation and gangrene of the intestines. Those species of it which are attended with purging must be considered as much less dangerous than those in which the vomiting is very violent. The iliac passion, or that attended with the vomiting of feces, is always to be accounted highly dangerous; but if the passage through the intestines is free, even though their peristaltic motion should be inverted, and clysters evacuated by the mouth, there is much more hope of a cure, than when the belly is obstinately colicive, and there is some fixed obstruction which seems to bid defiance to all remedies.

*Cure.* As the chief danger in colics arises from an inflammation and consequent mortification of the intestines, it is essentially necessary, in the first place, to diminish the tendency to a pyrexia, if there should happen to be any. This is accomplished by bleeding, emollient injections, warm bathing, and cooling medicines taken inwardly. Dr Porter, in the essay above-mentioned, strongly recommends the warm bath in those colics attended with violent evacuations of bile. He supposes it to do service by relaxing the constriction of the intestines, and thus preventing or removing the intussusception. In the mean time opiates may be given to ease the pain, while every method is tried, by cathartics and glysters of various kinds, to procure a stool. In obstinate cases, where stimulating cathartics have proved ineffectual, the milder kinds, such as manna, senna, oleum ricini, &c. will succeed; but where every thing of this kind fails, recourse must be had to some of the more extraordinary methods. Some have recommended the swallowing of leaden bullets, on a supposition that by their weight they would force through the obstruction into the gut; but these seem much more likely to create than to remove an obstruction. It is impossible they can act by their gravity, because the intestines do not lie in a straight line from the pylorus to the anus; and though this were actually the case, we cannot suppose that the weight of a leaden bullet could prove very efficacious in removing either a spasmodic constriction, or an obstruction from any other cause. But when we consider, not only that the intestines consist of a great multitude of solids, but that their peristaltic motion (by which only the contents are forced through them) is inverted, the futility of his remedy must be evident. It might rather be

supposed to aggravate the disease; as the lead, by its pressure, would tend to fix the intussusception more firmly, or perhaps push it still further on. The same thing may be said of quicksilver: not mention the pernicious consequences to be apprehended from swallowing large quantities of this mineral, even if it should prove efficacious in relieving the patient for the present. Another method hath been proposed, in the Medical Essays, for relieving the miserable patients in this disorder, which at least can be attended with no bad consequences, and in many cases hath been known to do service. The patient is to be taken out of bed, and made to walk about on the cold floor of a damp apartment. At the same time, porringers of cold water are to be dashed on his feet, legs, and thighs; and this must be continued for an hour or longer, if a stool is not procured before that time, though this will generally be the case much sooner. The exercise doth not at all impair the patient's strength, but rather adds to it; and some very remarkable instances are adduced in the 6th volume of the Medical Essays, where this proved effectual after all other medicines had failed. In one person the disease had come on with an habitual costiveness, and he had been for a week tormented with the most violent pain and vomiting, which could be stopped neither by anodynes nor any other medicines, the sharpest clysters being returned unaltered, and all kinds of purgatives thrown up soon after they were swallowed; but by the above-mentioned method, a stool was procured in 35 minutes, and the patient recovered. In some others the costiveness had continued for a much longer time.—Other remedies are, the blowing air into the intestines by means of a bellows, and the injecting clysters of the smoke of tobacco. But neither of these seem very capable of removing the disease. They can affect only the parts below the obstruction; while, to cure the disease, it is necessary that the obstructed parts themselves should be reached by the medicine, and therefore we have not many well-attested instances of their success. The cold water gives a general and very considerable shock to the system, checks the perspiration, and thus drives the humours inward upon the intestines, by which they receive a much more effectual stimulus than can be supposed to arise from any kind of clyster. But when all methods have failed, the only chance the patient can have for life is by a manual operation. See SURGERY.

In those colics which are attended with faintings, &c. from the beginning, and which generally attack hysterical women and other debilitated persons, all kinds of evacuations are pernicious; and the cure is to be attempted by anodynes and cordials, which will seldom fail of success.

CCXXXIV. COLICA PICTONUM; the Colic of  
*Piction.* Sp. II.

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Rachialgia Pictorum, *Sauv.* sp. 1.

Rachialgia metallica, *Sauv.* sp. 3.

Colica Pictorum *Citgifi et succedentium auctorum.*

ANOTHER cause to which violent colics are frequently to be ascribed, and which often gives occasion to them where it is very little suspected, is lead, or some

**PRACTICE** some solution or fume of it, received into the body. To this cause is evidently owing the colics to which plumbers, lead-miners, and smelters of lead, are subject. To the same cause, though not so apparent at first sight, are we to ascribe the Devonshire colic, where lead was received into the body dissolved in cyder, the common drink of the inhabitants of that county. This hath been proved by experiment; for lead hath been extracted from cyder in quantity sufficient to produce pernicious effects on the human body. The colic of Poitou, and what is called the *dry belly-ache* in the West Indies, are of the same nature; for which reason we give the following general description of the symptoms of all these diseases.

The patient is generally first seized with an acute pain at the pit of the stomach, which extends itself down with griping pains to the bowels. Soon after there is a distension, as with wind; and frequent reachings to vomit, without bringing up any thing but small quantities of bile and phlegm. An obstinate costiveness follows, yet sometimes attended with a tenesmus, and the bowels seem to the patient as if they were drawn up towards the back; at other times they are drawn into hard lumps, or hard rolls, which are plainly perceptible to the hand on the belly, by strong convulsive spasms. Sometimes the coats of the intestines seem to be drawn up from the anus and down from the pylorus towards the navel. When a stool is procured by artificial means, as clysters, &c. the feces appear in little hard knots like sheep's dung, called *scybals*, and are in small quantity. There is, however, usually an obstinate costiveness; the urine is discharged in small quantity, frequently with pain and much difficulty. The pulse is generally low, though sometimes a little quickened by the violence of the pain; but inflammatory symptoms very seldom occur. The extremities are often cold, and sometimes the violence of the pain causes cold clammy sweats and fainting. The mind is generally much affected, and the spirits are sunk. The disease is often tedious, especially if improperly treated, inasmuch that the patients will continue in this miserable state for twenty or thirty days successively; nay, instances have been known of its continuing for six months. In this case the pains at last become almost intolerable: the patient's breath acquires a strong fetid smell like excrements, from a retention of the feces, and an absorption of the putrid effluvia from them by the lacteals. At last, when the pain in the bowels begins to abate, a pain comes on in the shoulder-joints and adjoining muscles, with an unusual sensation and tingling along the spinal marrow. This soon extends itself from thence to the nerves of the arms and legs, which become weak; and that weakness increases till the extreme parts become paralytic, with a total loss of motion, though a numbness sensation often remains. Sometimes, by a sudden metastasis, the brain becomes affected, a stupor and delirium come on, and the nervous system is irritated to such a degree as to produce general convulsions, which are frequently followed by death. At other times, the peristaltic motion of the intestines is inverted, and a true iliac passion is produced, which also proves fatal in a short time. Sometimes the paralytic affection of the extremities

goes off, and the pain of the bowels returns with its former violence; and on the cessation of the pain in the intestines, the extremities again become paralytic, and thus the pain and palsy will alternate for a very long time.

**Cure.** Various methods have been attempted for removing this terrible disease. The obstinate costiveness which attends it, made physicians at first exhibit very strong purgatives and stimulating clysters. But these medicines, by increasing the convulsive spasms of the intestines, were found to be pernicious. Balam of Peru, by its warm aromatic power, was found to succeed much better; and Dr Sydenham accordingly prescribed it in the quantity of 40 drops twice or thrice a-day taken on sugar. This, with gentle purgatives, opiates, and some drops of the hotter essential oils, continued to be the medicine commonly employed in this disease, till a specific was published by Dr Lionel Chalmers of South Carolina. This receipt was purchased by Dr Chalmers from a family where it had long been kept a secret. The only unusual medicine in this receipt, and on which the efficacy of it chiefly if not wholly depends, is Roman vitriol. This must be dissolved in water, in the quantity of one grain to an ounce, and the dose of the solution is a wine-glassful given fasting for nine successive mornings. For the first four or five days this medicine discharges much arginous bile both ways: but the excretions of this humour lessen by degrees; and before the course is ended, it hath little other effect than to cause some degree of squeamishness, or promote a few bilious stools, or perhaps may not move the patient at all. At the time of using this medicine the patients should live upon broth made of lean meat, gruel, or panado; but about the seventh or eighth day, they may be allowed bread and boiled chicken. Here the copper seems to do service by its tonic power; and for the same reason, alum, recommended by Dr Percival, most probably cures the disease. He says he hath found this very efficacious in obstinate affections of the bowels, and that it generally proves a cure in the slighter cases of the colica pictonum. It was given to the quantity of fifteen grains every fourth, fifth, or sixth hour; and the third dose seldom failed to mitigate the pain, and sometimes entirely removed it. Among purgative medicines, the *oleum Ricini* is found to be the most efficacious.

CXXXV. The COLIC from *Cosivrensis*. Sp. III.

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Colica stercorea, *Sauv.* sp. 3.

Ileus a fecibus induratis, *Sauv.* sp. 2.

For the treatment of this species, see above.

CXXXVI. The Accidental COLIC. Sp. IV.

410

Colica Japonica, —accidentalis, —lactentium, —a veneno, *Sauv.* sp. 10. 14. 18. 20.

Cholera sicca auriginosa a fungis venenatis, *ejusd.* sp. 2.

When colics arise from acrid poisonous matter taken into the stomach, the only cure is either to evacuate the poison itself by vomit, or to swallow some other substance which may decompose it, and thus render it inactive. The most common and dangerous substances



stances of this kind are corrosive mercury and arsenic. The former is easily decomposed by alkaline salt; and therefore a solution of salt of tartar, if swallowed before the poison hath time to induce a mortification of the bowels, will prove a certain cure. Much more uncertain, however, is the case when arsenic is swallowed, because there is no certain and speedy solvent of that substance yet known. Milk hath been recommended as efficacious; and lately solution of *hepar sulphuris*. The latter may possibly do service; as arsenic unites readily with sulphur, and hath its pernicious qualities more obtunded by that than by any other known substance: but indeed, even the solvent powers of this medicine are so weak, that its effects as well as those of others must be very uncertain. See CHEMISTRY, n° 466.

Some kinds of fungi, when swallowed, are apt to produce colics attended with stupor, delirium, and convulsions; and the same sometimes happens from eating a large quantity of mushrooms\*. Some of the fungi, doubtless, may have an inherent poisonous quality; but generally they as well as the mushrooms act on a different principle. Their pernicious effects happen most commonly when they are taken on an empty stomach; and are then occasioned by their adhering so close to its coats, that it cannot exert its powers, and the whole system is thrown into the utmost disorder. The malady may therefore be very easily prevented; but when once it hath taken place, it cannot be removed till either a vomiting is excited, or the stomach hath recovered itself in such a manner as to throw off the adhering matter.

411 CXXXVII. COLIC of *New-born Infants* from a *Retention of the Meconium*. Sp. V. (*Sauv.* sp. 19.)

This disorder would be prevented were children allowed immediately to suck their mothers, whose milk at first is purgative. But as this is not commonly done, the child is frequently troubled with colics. These, however, may be removed by a few grains of ipecacuanha, a grain of emetic tartar, or a drop or two of antimonial wine. By these means the stomach is cleansed by vomiting, and the belly is generally loosened; but if this last effect doth not happen, some gentle purge will be necessary.

412 CXXXVIII. THE COLIC from a *Callosity of the Colon*. Sp. VI.

It is in a manner impossible to discover this distemper before the patient's death; and though it should, it doth not admit of a cure.

413 CXXXIX. THE COLIC from *Intestinal Calculi*. Sp. VII. (*Sauv.* sp. 10. 15.)

When certain indigestible bodies, such as cherries, plum-stones, small pieces of bones, &c. are swallowed, they frequently prove the basis of calculi, formed by an accretion of some kind of earthy matter, and, being detained in some of the flexures of the intestines, often occasion very violent colics. These calculi do not discover themselves by any peculiar symptoms, nor do they admit of any method of cure. In the Medical Essays we have an instance of colics for six years, occasioned by calculi of this kind. The concretions were at last passed by stool; and their passage was procured by causing the patient drink a large quantity of

warm water, with a view to promote the evacuation of bile, a redundancy of which was supposed to be the cause of her disorder.

GENUS LX. CHOLERA, the CHOLERA MORBUS.

Cholera, *Sauv.* 253. *Lin.* 186. *Vog.* 110. *Sag.* 188. *Hoffm.* II. 165.

Diarrhoea cholericæ, *Junc.* 112.

CXL. The *Spontaneous CHOLERA*, coming on without any manifest cause. Sp. I. 414

Cholera spontanea, *Sauv.* sp. 1. *Sydenh.* sect. iv. cap. 2.

Cholera Indica, *Sauv.* sp. 7.

CXLI. The *Accidental CHOLERA*, from acrid matters taken inwardly. Sp. II. 415

Cholera crapulosa, *Sauv.* sp. 11.

Cholera a venenis, *Sauv.* sp. 4. 5.

THE cholera shews itself by enormous vomiting and purging of corrupted matters, with violent pain, inflation and distension of the belly. Sometimes the patients fall into universal convulsions; and sometimes they are affected with violent spasms in particular parts of the body. There is a great thirst, small and unequal pulse, cold sweats, fainting, coldness of the extremities, and hiccup; and death frequently ensues in 24 hours. The cure of this distemper is effected by giving the patient a large quantity of warm water, or very weak broth, in order to cleanse the stomach of the irritating matter which occasions the disease, and injecting the same by way of clyster, till the pains begin to abate a little. After this, a large dose of laudanum is to be given in some convenient vehicle, and repeated as there is occasion. But if the vomiting and purging have continued for a long time before the physician is called, immediate recourse must be had to the laudanum, because the patient will be too much exhausted to bear any further evacuations. Sometimes the propensity to vomit is so strong, that nothing will be retained, and the laudanum itself thrown up as soon as swallowed. To settle the stomach in these cases, Dr Douglas, in the Medical Essays, recommends a decoction of oat-bread toasted as brown as coffee; and the decoction itself ought to be of the colour of weak coffee. He says he does not remember that this decoction was ever vomited by any of his patients. An infusion of mint-leaves in good simple mint-water is also said to be very efficacious in the same case.

GENUS LXI. DIARRHOEA, or LOOSENESS.

Diarrhoea, *Sauv.* gen. 253. *Lin.* 187. *Vog.* 105. *Sag.* gen. 189. *Junc.* 112.

Hepairrhœa, *Sauv.* gen. 246.

Cholericæ, *Lin.* 190.

Cœliaca, *Sauv.* gen. 255. *Lin.* 189. *Vog.* 109. *Sag.* gen. 199.

Lienteria, *Sauv.* gen. 256. *Lin.* 188. *Sag.* gen. 191. *Vog.* 108.

Pituitaria; & leucorrhœis, *Vog.* 111. 112.

CXLII. THE DIARRHOEA from *Surfeit*. Sp. I. 416

Diarrhoea stercorosa & vulgaris, *Sauv.* sp. 1. 2.

This is occasioned by the too great quantity of matter

\* See *Myctulus*.

ter thrown into the alimentary canal; and what is discharged hath not the appearance of excrements, but is much whiter, and of a thinner consistence. Voracious people who do not sufficiently chew their food, gormandizers, and even those who stammer in their speech, are said to be liable to this disease. In slighter cases it is removed without any medicine, or by a dose of rhubarb; but where the matters have acquired a putrid taint, the disorder may be exceedingly protracted and become dangerous. In this case lenient and antiseptic purgatives are to be made use of, after which the cure is to be completed by astringents.

417 CXLIII. The *Bilious DIARRHOEA*. Sp. II.

(*Sauv.* sp. 8.)

This distemper shews itself by copious stools of a very yellow colour, attended with gripes and heat of the bowels, thirst, bitterness, and dryness of the mouth, yellowness of the tongue, and frequently follows an intermitting or bilious fever. When the fever is gone, the diarrhoea is to be removed by acidulated and cooling drinks, with small doses of nitre.

418 CXLIV. The *Mucous DIARRHOEA*. Sp. III.

*Diarrhoea lactentium*, *Sauv.* sp. 19.

*Dysenteria Parisiaca*, *Sauv.* sp. 3.

*Diarrhoea ab hypercatharsi*, *Sauv.* sp. 16.

*Dysenteria a catharticiis*, *Sauv.* sp. 12.

*Pituitaria*, *Vog.* 111.

*Leucorrhoeis*, *Vog.* 112.

*Diarrhoea pituitosa*, *Sauv.* sp. 4.

*Cœliaca mucosa*, *Sauv.* sp. 3.

*Diarrhoea serosa*, *Sauv.* sp. 10.

a. *Diarrhoea urinosa*.

This kind of diarrhoea, besides the matters usually excreted, is attended with a copious dejection of the mucus of the intestines with great pain; while the patient daily pines away, but without any fever.—Persons of all ages are liable to it, and it comes on usually in the winter-time; but is so obstinate, that it will sometimes continue for years. In obstinate loosenesses of this kind, vomits frequently repeated are of the greatest service. It is also very beneficial to keep the body warm, and rub the belly with stimulating ointments; at the same time that astringent clysters, rhubarb, and stomachic medicines, are to be exhibited. Starch clysters are very often efficacious.—Some kinds of looseness are contagious; and Sir John Pringle mentions a soldier who laboured under an obstinate diarrhoea, who infected all those that used the same privy with himself. In the looseness which frequently followed a dysentery, the same author tells us that he began the cure with giving a vomit of ipecacuanha, after which he put the patients on a course of astringents. He used a mixture of three drachms of extract of logwood, dissolved in an ounce and a half of spirituous cinnamon-water, to which was added seven ounces of common water, and two drachms of japonic tincture. Of this the patient took two spoonfuls once in four or five hours, and sometimes also an opiate at bed-time. He recommends the same medicine in obstinate diarrhoeas of all kinds. A decoction of simarouba bark was also found effectual, when the dysenteric symptoms had gone off.

Dr Huck, who used this remedy in North-America, also recommends it in diarrhoeas. Two or three ounces of it are to be boiled in a pound and a half of water to a pound, and the whole quantity taken throughout the day. He began with the weakest decoction; and, when the stomach of the patient could easily bear it, he then ordered the strongest: but at the same time he acknowledges, that, unless the sick found themselves sensibly better within three days from the time they began the medicine, they seldom afterwards received any benefit from it. But when all astringents have failed, Sir John Pringle informs us, he hath known a cure effected by a milk and farinaceous diet; and he thinks in all cases the disorder would be much more easily removed, if the patients could be prevailed on to abstain entirely from spirituous liquors and animal-food. If the milk by itself should turn sour on the stomach, a third part of lime-water may be added. In one case he found a patient receive more benefit from good butter-milk than from sweet-milk. The chief drinks are decoctions of barley, rice, calcined hartshorn, toast and water, or milk and water.

CXLV. The *COELIAC PASSION*. Sp. IV.

*Cœliaca chylosa*, *Sauv.* sp. 1.

*Cœliaca lactea*, *Sauv.* sp. 4.

419 THERE are very great differences among physicians concerning the nature of this disease. Sauvages says, from Aretæus, it is a chronic flux, in which the aliment is discharged half digested. It is attended with great pains of the stomach, resembling the pricking of pins; rumbling and flatus in the intestines; white stools, because deprived of bile, while the patient becomes weak and lean. The disease is tedious, periodical, and difficult to be cured. Sauvages adds, that none of the moderns seem to have observed the disease properly; that the excrements indeed are white, on account of a deficiency of the bile, but the belly is bound as in the jaundice. Dr Cullen says there is a dejection of a milky liquid of the nature of chyle; but this is treated by Vogel as a vulgar error. He accuses the moderns of copying from Aretæus, who mentions white faeces as a symptom of the distemper; from whence authors have readily fallen into the notion that they never appeared of any other colour in persons labouring under the coeliac passion. This error quickly produced another, which hath been very generally received; namely, that the chyle was thrown out of the lacteals by reason of some obstruction there, and thus passed along with the excrements; of which he says there is not the least proof, and agrees with Aretæus that the whiteness is only occasioned by the want of bile. He endeavours to prove at length, that the coeliac passion can neither be occasioned by an obstruction of the lacteals, nor of the mesenteric glands; though he owns that such as have died of this disease and were dissected, had obstructions in the mesenteric glands; but denies that all those in whom such obstructions occur, are subject to the coeliac passion. He considers the distemper as arising from a cachexy of the stomachic and intestinal juices; and directs the cure to be attempted by emetics, purgatives, antiseptics, and tonics, as in other species of diarrhoea.

CXLVI. The

## CXLVI. The Lientery. Sp. V.

Lienteria spontanea, *Sauv.* sp. 2.

THE Lientery, according to Sauvages, differs from the cœlic passion only in being a lighter species of the disease. The aliment passes very quickly through the intestines, with scarce any alteration. The patients do not complain of pain, but are sometimes affected with an intolerable hunger. The cure is to be attempted by stomachics and tonics, especially the Peruvian bark.

## CXLVII. The Hepatic Flux. Sp. VI.

Hepaticirrhœa intestinalis, *Sauv.* sp. 2.

THE hepatic diarrhœa is by Sauvages described as a flux of bloody serous matter like the washings of flesh, which percolates through the coats of the intestines by means of the anastomosing vessels. It is the cœlic passion of Trallian; and which, according to Sauvages, rarely, if ever, occurs as a primary disease. It hath, however, been observed to follow an inflammation of the liver, and then almost always proves fatal.

## GENUS LXII. DIABETES, or too great a Quantity of URINE.

Diabetes, *Sauv.* gen. 263. *Lin.* 197. *Vog.* 115. *Sag.* gen. 199. *Junc.* 99. *Dobson*, Med. Observat. Vol. V. p. 298. *Home's* Clinical Experiments, sect. xvi.

Diuresis, *Vog.* 114.

## CXLVIII. THE DIABETES with sweet Urine. Sp. I.

Diabetes Anglicus, *Sauv.* sp. 2. *Mead* on Poisons, Essay I. *Ejusdem* *Monita* Med. cap. ix. sect. 2. *Dobson* in Lond. Med. Observ. Vol. V. art. 27. *Meyer's* Diss. inaug. de Diabete. Edinb. 1779.

Diabetes febriculus, *Sauv.* sp. 7. *Sydenh.* Ep. resp. ad. R. Brady.

## CXLIX. DIABETES with inspid Urine. Sp. II.

*M. Lister* Exerc. Medicin. II. de Diabete.

Diabetes legitimus, *Sauv.* sp. 1. *Aræteus* de morb. diuturn. lib. ii. cap. 2.

Diabetes ex vino, *Sauv.* sp. 5. *Ephem. Germ.* D. I. A. II. Observ. 122.

*Description.* The diabetes first shews itself by a dryness of the mouth and thirst, white frothy spittle, and the urine in somewhat larger quantity than usual. A heat begins to be perceived in the bowels, which at first is a little pungent, and gradually increases. The thirst continues to augment by degrees, and the patient gradually loses the power of retaining his urine for any length of time. It is remarkable, that, tho' the patients drink much, the quantity of urine always exceeds what is drank. In *Home's* Clinical Experiments we have an account of two patients labouring under this disease: one of them drank between 10 and 12 English pints a-day, without being satisfied. The quantity was greater in the forenoon than in the afternoon. In the other the case was reversed. He drank about four pints a-day, and more in the afternoon than the forenoon. The former passed from 12 to 15 pints of urine a-day: the latter, 11 or 12;

so that his urine always exceeded his drink by eight, or at least seven pints. When the urine is retained a little while, there is a swelling of the loins, ilia, and testes; the strength gradually decays; the skin is dry and shrivelled; œdematous swellings arise in various parts of the body, but afterwards subside without relieving the disease in the least; and the patient is frequently carried off by convulsions.

The most singular phenomenon in this disease is, that the urine seems to be entirely or very much divested of an animal-nature, and to be largely impregnated with a saccharine salt scarce distinguishable from that sold in the shops. This discovery was first made by Dr Dobson of Liverpool, who made some experiments on the urine of a person labouring under a diabetes, and who made 28 pints of urine every day, taking during the same time from 12 to 14 pounds of solid and liquid food. Some of this urine being let by, fell into a spontaneous effervescence, changed first into a vinous liquor, and afterwards into an acetous one, before it became putrid and offensive. Eight ounces of blood taken from the same patient, separated into crassamentum and serum; the latter being sweet to the taste, but less so than the urine. Two quarts of the urine, evaporated to dryness, left a white cake weighing four ounces two drachms and two scruples. This cake was granulated, and broke easily between the fingers: it smelled sweet like brown sugar; neither could it by the taste be distinguished from sugar, except that it left a slight sense of coolness on the tongue. The experiment was repeated after the patient was recovered to such a degree as to pass only 14 pints of urine a-day. There was now a strong urinous smell during the evaporation; and the residuum could not be procured in a solid form, but was blackish, and much resembled very thick treacle. In Dr *Home's* patients, the serum of the blood had no preternatural sweetness; in one of them the crassamentum was covered with a thick inflammatory crust. In one of these patients the urine yielded an ounce and a half, and in the other an ounce, of saccharine matter from each pound. It had, however, an urinous smell, and a saline taste mixed with the sweet one; and the urine of one fermented with yeast, we are told, into "tolerable small-beer." Both these patients had a voracious appetite, and perpetual gnawing sense of hunger; as had also Dr Dobson's patient. The inspid urine of those affected with diabetes hath not been examined by physicians.

*Causes.* These are exceedingly obscure and uncertain; spasms of the nervous system, debility, and every thing inducing it, but especially strong diuretics and immoderate venery, have been accused as bringing on the diabetes. It hath, however, occurred in persons where none of all these causes could be suspected; nor have the best physicians been able to determine it.—Dissections have only shewn that the kidneys were in an enlarged and lax state. In one of Dr *Home's* patients who died, they smelled foul; which shewed that the urine peculiar to diabetes came from the kidneys, and was not sent directly from the intestines by a retrograde motion of the lymphatics, as some imagine.

*Prognosis.* The diabetes is rarely cured, unless when taken at the very beginning, which is seldom done; and



and in a confirmed diabetes the prognosis must therefore be unfavourable.

*Cure.* The only hopes of a cure in this distemper are from altringer and strengthening medicines. Dr Dobson's patient was relieved by the following remedies; which, however, were frequently varied, as none of them produced their good effects for any length of time: The bark in substance, with small doses of rhubarb; decoction of the bark, with the acid elixir of vitriol; the cold infusion of the bark, of which he drank from a quart to two quarts daily; Dover's powder; alum-whey; lime-water; antimonials combined with *tinctura Thebaica*. The warm bath was used occasionally when the skin was remarkably hot and dry, and the patient complained of restlessness and anxiety. The tincture of cantharides was likewise tried; but he could never take more than 25 drops to a dose, without exciting great uneasiness in his bowels. The body was kept constantly open, either with rhubarb, or the infusion of senna joined with rhubarb. His common drinks were rice-water, barley-water, lime-water and milk; lime-water alone; sage, balm, or mint-tea; small-beer, simple water, and water acidulated with the vitriolic acid. In seven months, these remedies, in whatever manner varied, made no further progress in removing the disease. In Dr Home's patients, all these medicines, and many others, were tried without the least good effect; inasmuch that he uses this remarkable expression: "Thus, these two patients have exhausted all that experience had ever recommended, and almost all that theory could suggest; yet, in both cases, the disease has resisted all the means of cure used." It is remarkable, that though septicæ were given to both, in such quantity as evidently to produce a putrefecency in the *prima viæ*, the urine remained unaltered both in quantity and quality.

#### 424 CLII. HYSTERIA, HYSTERICS. Genus LXIII.

*Hysteria*, Sauv. gen. 135. Lin. 126. Vog. 219. Sag. gen. 242.

*Malum hystericum*, Hoffm. III. 50. Junck. 36.

*Affectio hysterica*, Willis de Morb. Convulsiv. cap. 5, 10, 11. Sydenham Diff. Epiit. ad G. Cole, *Whytt* on Nervous Disorders.

*Description.* The hysteria is a convulsive disease which comes on at uncertain intervals, sometimes longer and sometimes shorter, but at no stated time. The paroxysms commonly begin with a languor and debility of the whole body; yawning, stretching, and restlessness. A sense of coldness, also, in the extremities, almost always precedes, and for the most part remains during the whole time of the paroxysm. To this sometimes succeeds a sense of heat; and the two sensations alternate with each other in different parts of the body. The face is sometimes flushed and sometime pale; and sometimes the paleness and flushing come alternately. There is a violent pain in the head; the eyes become dim, and pour out tears; there is a rumbling and inflation of the intestines; a sensation is felt like that of a globe ascending from the lower part of the abdomen or hypogastrium, which sometimes seems to roll along the whole alimentary canal. It ascends to the stomach, sometimes suddenly, sometimes slowly; and there produces a sense of inflation and weight, together with anxiety, nausea, and vomiting. At last it comes up to

the throat, where it produces a sense of suffocation, and difficulty of breathing or swallowing. All this time there are the most violent pains both in the external and internal parts of the abdomen; the muscles are convulsed; the navel is drawn inwards; and there are frequently such spasms of the intestines, that neither clysters can be injected, nor even flatus pass downwards. Sometimes the paroxysm remits after these symptoms have continued for a certain time, but more frequently the patients fall into fainting fits; sometimes they lie without motion, as if they were in a deep sleep; sometimes they beat their breasts violently and continually with their hands, and sometimes they are seized with general convulsions, and the disease puts on the appearance of an epilepsy. In some patients the extremities become cold and stiff, and the body has the appearance of one in a catalepsy. Sometimes a most violent beating pain takes place in some part of the head, as if a nail was driving into it, and all visible objects seem to turn round; grievous pains attack the loins, back, and bladder, and the patients make a surprising quantity of urine as limpid as water; which last is one of the surest signs of the disease. The mind is very much affected as well as the body. Sometimes the patients are tormented with vain fears; sometimes they will laugh, at other times cry immoderately; and sometimes their temper becomes so peevish and fretful, that they cannot enjoy a moment's quiet.

*Causes, &c.* The general cause of hysteria is thought by the best physicians to consist in a too great mobility and irritability of the nervous system, and of consequence may be brought on by whatever debilitates and renders the body irritable. Hence the disease most frequently attacks females of a weak and lax habit of body, though there are some instances of men also attacked by it. The disease generally comes on between the time of puberty and the age of 35, and makes its attacks during the time of menstruation more frequently than at any other. It also more usually seizes barren women and young widows, than such as are bearing children.

*Prognosis.* Though the appearance of this disease is so very terrible, it seldom proves mortal unless by wrong treatment: but notwithstanding this it is extremely difficult of cure, and rarely admits of any thing else than being palliated; for though it should seem to be conquered by medicine for a time, it very quickly returns, and that from the slightest causes.

*Cure.* The most powerful remedy hitherto discovered in hysterical cases is opium, or the solution of it called *laudanum*. By this commonly the most violent paroxysms are stopped, though it is insufficient to accomplish a radical cure. In Home's Clinical Experiments we find an instance of a cure performed by venesection, though this remedy hath been generally condemned in hysterical cases. *Asafetida* seems to stand next in virtue to opium; though with some it disagrees, and occasions pains in the stomach and vomiting. *Ether* will also frequently remove an hysterical fit: but its effects are of short duration; and if it do not effect a cure soon after its exhibition, no service is to be expected either by perseverance in the use of it or by increasing the dose, and with some constitutions it disagrees to such a degree as to occasion convulsions. If the patient is seized with a violent fit, so that the

PRACTICE can swallow nothing, which is frequently the case, it will be proper to apply some strong volatile alkali to her nose; or if that be not at hand, the vapour of burning feathers is sometimes very efficacious. A plaster of galbanum and asafetida will also prove serviceable: but it must be remembered, that none of these things will prevent the return of the disease; and therefore a radical cure is to be attempted by exercise, the Peruvian bark, chalybeates, mineral waters, and other tonics.

#### GENUS LXIV. HYDROPHOBIA, the Dread of WATER.

Hydrophobia, *Sauv. gen.* 231. *Lin.* 86. *Vog.* 30. *Sag. gen.* 343. *Boerb.* 1138. *Junck.* 124. *Mead* on poisons. *Desault* sur la rage. *Sauv. diff.* sur la rage. *James* on canine madness. *Dalby*, Virtues of cinnabar and musk against the bite of a mad dog. *Nugent* on the hydrophobia. *Choisel*, Nouvelle methode pour le traitement de la rage. *Journal de Medicine*, passim. *Medical Obs. and Inquiries*, vol. iii. art. 34. vol. v. art. 20. 26. and *App. Med. Transact.* vol. ii. art. 5. 12. and 15. *Hoskham*, *Diff. inaug. de rab. canin.* Edinb. 1777. *Parry*, *Diff. inaug. de rab. contagios.* five canin. Edinb. 1778. *Andry*, Recherches sur la rage, 1778. *Vaughan*, Cases of hydrophobia, second edit. 1778.

#### 425 CLII. HYDROPHOBIA Rabiosa, or Hydrophoby consequent on the Bite of a Mad Animal. Sp. I.

Hydrophobia vulgaris, *Sauv. sp.* 1.

*Description.* This disease commonly does not make its attack till a considerable time after the bite. In some few instances it hath commenced in seven or eight days from the accident; but generally the patient continues in health for 20, 30, or 40 days, or even much longer. The bite hath been healed long before that time, frequently with the greatest ease; though sometimes it resists all kinds of healing applications, and forms a running ulcer which discharges a quantity of matter for many days. It has been said, that the nearer the wounded place is to the salivary glands, the sooner the symptoms of hydrophobia appear. The approach of the disease is known by the cicatrix of the wound becoming high, hard, and elevated; pains shoot from it towards the throat: sometimes it is surrounded with livid or red streaks, and seems to be in a state of inflammation; though frequently there is nothing remarkable to be observed about it. The patient becomes melancholy, loves solitude, and hath a sickness at stomach. Sometimes the peculiar symptom of the disease, the dread of water, comes on all at once. We have an instance of one who, having taken a vomit of ipecacuanha for the sickness he felt at his stomach, was seized with the hydrophobia in the time he was drinking the warm water. Sometimes the disease begins like a common sore throat; and the soreness daily increasing, the hydrophobic symptoms shew themselves like a convulsive spasm of the muscles of the fauces. In others, the mind seems to be primarily affected, and they have a real dread of water or any liquid before they try whether they can swallow it or

not. Dr James, in his treatise on canine madness, mentions a boy sent out to fill two bottles with water, who was so terrified by the noise of the liquid running into them, that he fled into the house crying out that he was bewitched. He mentions also the case of a farmer, who, going to draw fowle ale from a cask, was terrified to such a degree at its running into the vessel, that he ran out in a great haste with the spigot in his hand. But in whatever manner this symptom comes on, it is certain that the most painful sensations accompany every attempt to swallow liquids. Nay, the bare sight of water, of a looking-glass, of any thing clear or pellucid, will give the utmost uneasiness, or even throw them into convulsions.

With regard to the affection of the mind itself in this disease, it does not appear that the patients are deprived of reason. Some have, merely by the dint of resolution, conquered the dread of water, though they never could conquer the convulsive motions which the contact of liquids occasioned: while this resolution hath been of no avail; for the convulsions and other symptoms increasing, have almost always destroyed the unhappy patients.

In this disease there seems to be an extreme sensibility and irritability of the nervous system. The eyes cannot bear the light, or the sight of any thing white; the least touch or motion offends them, and they want to be kept as quiet and in as dark a place as possible. Some complain of the coldness of the air, frequently when it is really warm. Others complain of violent heat; and have a great desire for cold air, which yet never fails to increase the symptoms. In all there is a great flow of viscid saliva into the mouth; which is exceedingly troublesome to the patients, as it has the same effect upon their fauces that other liquids have. This therefore they perpetually blow off with violence, which in a patient of Dr Fothergill's occasioned a noise not unlike the hollow barking of a dog, and which he conjectures might have given rise to the common notion that hydrophobic patients bark like dogs. They have an insatiable thirst; but are unable to get down any drink, except with the utmost difficulty; though sometimes they can swallow bread soaked in liquids, slices of oranges, or other fruits. There is a pain under the *sacroculus cordis*, as in the tetanus; and the patients mournfully point to that place as the seat of the disease. Dr Vaughan is of opinion that it is this pain, rather than any difficulty in swallowing, which distresses the patient on every attempt to drink. The voice is commonly plaintive and mournful; but Dr Vaughan tells us there is a mixture of fierceness and timidity in the countenance which he cannot describe, but by which he could know a hydrophobic person without asking any questions.

In this distemper, indeed, the symptoms are so various, that they cannot be enumerated; for we will seldom read two cases of hydrophobia which do not differ very remarkably in this respect. Some seem to have at times a furious delirium, and an inclination to spit at or bite the bystanders; while others shew no such inclination, but will even suffer people to wipe the inside of their mouths with the corner of a handkerchief in order to clear away the viscid saliva which is ready to suffocate them. In some male patients there is an involuntary erection of the penis, and emission of  
the

the femur; and the urine is forced away by the frequent return of the spasms. In a letter from Dr Wolf of Warfaw to Henry Baker, F. R. S. dated Warfaw Sept. 26th 1767, we have the following melancholy account of the cases of five persons who died of the hydrophobia, "None of them quite lost their right senses; but they were all talking without intermission, praying, lamenting, despairing, cursing, fighting, spitting a frothy saliva, screeching, sometimes belching, retching, but rarely vomiting. Every member is convulsed by fits, but most violently from the navel up to the breast and oesophagus. The fit comes on every quarter of an hour; the fancies are not red, nor the tongue dry. The pulse is not at all feverish, and when the fit is over nearly like a sound pulse. The face grows pale, then brown, and during the fit almost black; the lips livid; the head is drowsy, and the ears tingling; the urine limpid. At last they grow weary; the fits are less violent, and cease towards the end; the pulse becomes weak, intermittent, and not very quick; they sweat, and at last the whole body becomes cold. They compose themselves quietly as if to get sleep, and so they expire. The blood let out a few hours before death appears good in every respect. A general observation was, that the lint and dressings of the wounds, even when dry, were always black, and that when the pus was very good in colour and appearance." In one of Dr Wolf's patients who recovered, the blood stunk intolerably as it was drawn from a vein; and one of Mr Vaughan's patients complained of an intolerable fetid smell proceeding from the wounded part, though nobody but himself could perceive it. In general, the violent convulsions cease a short time before death; and even the hydrophobia goes off, so that the patients can drink freely. But this does not always happen; for Mr Vaughan mentions the case of a patient, in whom, "when he had in appearance ceased to breathe, the spasmus cynicus was observable, with an odd convulsive motion in the muscles of the face; and the strange contrariety which took place in the action of these produced the most horrid assemblage of features that can well be conceived. Of this patient also it was remarkable, that in the last hours of his life he ceased to call for drink, which had been his constant request; but was perpetually asking for something to eat."

The hydrophobia seems to be a symptom peculiar to the human race; for the mad animals which communicate the infection, do not seem to have any dread of water. Dr Wolf, in the letter above quoted, says in general, that cattle bit at the same time and by the same animal (a mad wolf) which bit the persons whose cases he relates, died nearly with the same frightful raging as the men; but says nothing of their having any hydrophobia: nay, Dr James and some others assert, that the hydrophobia is not always an attendant on rabies canina in the human race; and indeed it is certain that the disease has proved mortal after this terrible symptom hath been removed. With regard to the symptoms of madness in dogs, they are very equivocal; and those particularly enumerated by some authors, are only such as might be expected in dogs violently heated or agitated by being violently pursued and struck. One symptom indeed, if it could be depended upon, would determine

the matter; namely, that all other dogs avoid and run away from one that is mad; and even large dogs will not attack one of the smallest size who is infected with this disease. Upon this supposition they point out a method of discovering whether a dog who hath been killed was really mad or not, namely, by rubbing a piece of meat along the inside of his mouth, and then offering it to a sound dog. If the latter eats it, it is a sign the dog was not mad; but if the other rejects it with a kind of howling noise, it is certain that he was. Dr James tells us, that among dogs the disease is infectious by staying in the same place; and that after a kennel hath been once infected, the dogs put into it will be for a considerable time afterwards in danger of going mad also. A remedy for this, he says, is to keep geese for some time in the kennel. He rejects as false the opinion that dogs when going mad will not bark; though he owns that there is a very considerable change in their bark, which becomes hoarse and hollow.

*Causes, &c.* In no disease whatever are we more at a loss to discover the causes than in the hydrophobia. In dogs, foxes, and wolves, it seems to come on spontaneously; though this is contested by some authors. It is said, that the causes commonly assigned, viz. heat, feeding upon putrid flesh, want of water, &c. are not sufficient for producing the distemper. It does not appear that madness is more frequent among dogs in the warm than in the cold climates; nay, in the island of Antigua, where the climate is very hot, and the water very scarce, the dogs are said not to be subject to this distemper. As to putrid aliment, it seems natural for dogs to prefer this to any other, and they have been known to subsist upon it for a long time without any detriment. For these reasons, they think the disease arises from a specific contagion, like the small-pox and measles among the human race, which, being once produced by causes unknown, continues to be propagated by the intercourse which dogs have with each other, as the diseases just mentioned continue to be propagated among the human race by means of the intercourse which they have with one another.

With regard to the immediate cause among mankind, there is not the least doubt that the hydrophobia is occasioned by the saliva of the mad animal being mixed with the blood. It doth not appear that this can operate through the cuticula; but, when that is rubbed off, the smallest quantity is sufficient to communicate the disease, and a slight scratch with the teeth of a mad animal hath been found as pernicious as a large wound. It is certain also, that the infection hath been communicated by the bites of dogs, cats, wolves, foxes, weasels, swine, and even cocks and hens, when in a state of madness. But it does not appear that the distemper is communicable from one hydrophobous person to another, by means of the bite, or any other way. Dr Vaughan inoculated a dog with the saliva of a hydrophobous child, but the animal continued free from disease for two months; and though the doctor promised to inform the public if it should happen to occur afterwards, nothing hath hitherto appeared on that subject. A nurse also frequently kissed this child during the time of his disorder, but no bad consequence ensued.



When we attempt to investigate the nature of the cause of the hydrophobia by dissections, our inquiries are commonly disappointed. In two bodies opened by Dr Vaughan, there was not the least morbid appearance; in the few fauces, where we might have expected that the disease would have shewn itself most evidently, there was not the least appearance even of inflammation. The stomach, intestines, diaphragm, œsophagus, &c. were all in a natural state: neither do we find in authors of credit any certain accounts of morbid appearances in the bodies of hydrophobous persons after death. Dr Vaughan therefore concludes, that the poison acts upon the nervous system; and is so wholly confined to it, that it may be doubted whether the qualities of the blood are altered by it or not; and that it acts upon the nerves by impairing and disturbing their functions to such a degree as speedily to end in a total extinction of the vital principle. As to the difficulty in swallowing generally believed to accompany the dread of water, he treats it as misrepresentation, as well as that the œsophagus with the muscles subservient to deglutition are specially concerned in this disease. The principal foundation of the evil, he thinks, rests on a morbid sensibility both of the external and internal fauces. For the sight of a liquid, or the application of any substance to the internal fauces, but more especially of a fluid, instantly excites the most painful feelings. Nay, the same symptoms are produced by touching the external fauces with a fluid, or by the contact of cold air with these parts; and nearly in as great a degree. But a solid or a fluid substance being conveyed into the œsophagus, the transit into the stomach is accomplished with little or no impediment; so that in fact the difficulty is surmounted before the patient is engaged in the action of swallowing. Nor is the excruciating pain which never fails to be the companion of every attempt to drink, felt in the *fauces* and *throat*: it is, he says, at the *scrobiculus cordis*; to which the sufferer applies his hand. From this last circumstance, therefore, from the presence of the *risus sardonius*, from the muscles of the abdomen being forcibly contracted, and from the sense of suffocation which seems to threaten the patient with immediate death, Dr Vaughan has been led to think that in the hydrophobia a new sympathy was established between the fauces, the diaphragm, and the abdominal muscles.

**Prognosis.** When a person is bit, the prognosis with regard to the ensuing hydrophobia is very uncertain. All those who are bit do not fall into the disease; nay, Dr Vaughan relates, that out of 30 bit by a mad dog, only one was seized with the hydrophobia. During the interval betwixt the bite and the time the disease comes on, there are no symptoms by which we can judge whether it will appear or not. When once it hath made its appearance, the prognosis is exceedingly fatal.

**Prevention and Cure.** It hath been generally allowed by practitioners, that though the hydrophobia may be prevented, yet it can seldom or ever be cured after it has made its appearance. A great number of different methods of prevention have been attempted. Bathing in cold water, especially in the sea, and drinking sea-water for a certain time, have been prescribed, and by some accounted a certain preventative.

When this was known to fail, a long course of antiphlogistic regimen, violent submersion in water even to danger of drowning, and keeping the wounded place open with cauteries, were recommended.—To this extreme severity Dr Mead objected; and in his treatise on this subject endeavours to shew, that in all ages the greatest success hath been reaped from diuretics, for which reason he proposes the following powder: “Take ash-coloured ground-liverwort, half an ounce; black-pepper, two drachms: reduce them separately to powder, then mix them together.” But this medicine, which was inserted in former editions of the London Dispensatory under the name of *Pulvis Antilyssus*, has long lost its credit.

There is a famous East-India medicine, composed of 24 grains of native and as much factitious cinnamon, made into a powder with 16 grains of musk. This is called the *Tonquin* medicine, and must be taken in a tea-cup-full of arrac or brandy; and is said to secure the patient for 30 days, at the expiration of which it is to be repeated; but if he has any symptoms of the disease, it must be repeated in three hours, which is said to be sufficient for a cure. The first dose is to be taken as soon after the bite as possible.

Another celebrated remedy is *Palmarius's* powder, composed of the leaves of rue, vervain, sage, poly-pody, wormwood, mint, mugwort, balm, betony, St John's-wort, and lesser centaury. These herbs must be gathered in their prime, dried separately in the shade, and then powdered. The dose is a drachm, or a drachm and an half, taken every day.

A remedy which might promise to be more efficacious than any of those hitherto mentioned is mercury. This hath been recommended in frictions, and to be taken inwardly in the form of calomel and turbit-mineral, in order if possible to raise a slight salivation, on which the efficacy was thought to depend. Besides this, venesection, opium, the bark, camphire, have have been tried in very large quantities; the warm bath; and, in short, every thing which human invention could suggest; but with what success, can best be judged from the following well-authenticated cases.

In the beginning of December 1728, a young gentleman, aged 17, was bit by a dog in the middle-finger of the right-hand about the middle of the nail. In the beginning of January 1729, he complained of pain in that finger reaching along the back of the hand to the elbow. In the night between the sixth and seventh days of that month, he became hot and restless: emollient and anodyne fomentations were applied; but the pain became very sharp, and the hydrophobia came on in the night-time. He was bloodied; but became worse every hour, and at last quite furious and outrageous. The bandage was thrown off from his arm, and he lost about 20 ounces of blood besides what had formerly been taken from him. This, however, made no abatement of the symptoms, and he died the same night.

In 1753, a woman, seized with the hydrophobia in consequence of the bite of a dog supposed to be mad, was treated in the following manner by Dr Nugent. First she was blooded to about 15 ounces; she took 15 grains of musk in powder, and alongst with it a pill of two grains of pure opium, every three hours. A plaster of galbaum, with half an ounce of pure opium, was laid

PRACTICE laid to her neck and throat. She began to take these medicines on a Saturday morning, an hour or two after the dread of water had commenced. In the evening she was a little easier at intervals. The musk and opium pill were continued as before, and the hand that was bit was ordered to be chafed with warm salad oil several times a-day. Only two papers of powder and two pills were taken in the night, for the last made her sick and vomit. She had little or no sleep, but lay pretty quiet.—On Sunday, 20 ounces of blood were taken away, and a clyster with antimonial wine injected: the pills and powders were continued as before. On Sunday evening she could swallow liquids a little better, and the lay quiet most of the night. On Monday her swallowing was greatly better: The musk and opium were continued, and twelve ounces more of blood were taken from her; the plaster was renewed with only two drachms of opium, and the oil was used as before. At night she was better; her hand easy; and by a continuance of these remedies she recovered.—This was the case which chiefly brought opium into reputation.

The following cases published by De Sault, a Frenchman, first brought mercury into reputation.—Four men were bitten by the same wolf, on the same day, at the same hour. They were dipped in salt-water, and came back persuaded that they had nothing to fear. Some days after, one of them felt a numbed pain about his scars, while the scars themselves grew hard and rose like an embroidery: he was soon after seized with the usual symptoms, as did also another. The son of the former likewise began to feel a pain about the cicatrices, and a swelling with hardness; as did also the fourth. They were ordered to rub a drachm and a half of the mercurial or blue ointment upon the cicatrices and about the whole arm. This was repeated three days successively, and then every other day: after the fifth friction, he allowed an interval of two days. Besides this, they took every day a drachm and an half of Palmarius's powder. After the third friction the cicatrices grew flat and soft, the pain went off, their courage returned, and their mind resumed its former tranquillity.

But how far mercury, or indeed any thing else, is from being a *specific* in the hydrophobia, will appear from the following account of Dr Wolf's patients.—In the middle of April 1767, seventeen people and a great number of cattle were bitten in the neighbourhood of Warlaw by a mad wolf. One of these, an officer, was brought into the city that same day, and had the best advice of the surgeons and physicians in that place; besides which, he took the bark every copiously with camphire. He continued well till the seventh week, when he became hydrophobous, and died.

Eleven of the others applied to Dr Wolf on the ninth day. Their wounds were all deeply scarified; diligently washed and fomented with vinegar, salt, and theriac; and kept open till the 80th day, in those who lived so long. Every two weeks they were blooded largely, and were purged every week with salts and jalap. Their diet was mostly vegetable, and their drink whey and water. They all eat as much as could be got of the herbs *matrisylvia* and *anagallis flore punicea*; and they all took often of

the *pulvis Palmarii*. The *mycus cinereus terrestris* could not be got, or it would also have been prescribed. Besides the general treatment, two were rubbed daily with a drachm of mercurial ointment, and had their purges with calomel. Two took every day four ounces of vinegar, three drachms tincture of poppies, and half an ounce of *rob sambuci* every night. One took every day 16 grains of camphire, with four scruples of felpetre, and at night half an ounce of *rob sambuci*. Two took 24 grains of musk, with 50 grains of cinnabar. Other two took from 40 to 60 drops of spirit of fal ammoniac with quick-lime, and the last took a scruple of crystallized salt of tartar made by the mixture of a little spirit of fal ammoniac with a solution of that salt.

One of the first who used the mercurial ointment was seized with the hydrophobia on the 22d day, immediately after being well purged with calomel. He was blooded copiously, plunged abundantly in cold water, and had several clysters administered, without effect. Two pounds of oil, and as much of drink, were poured down by force: also a drachm of soap of tartar and half a drachm of musk were given in three doses. He then began to drink freely, but died the third day. His companion then left off the use of mercury, and took 80 drops a-day of Dippel's animal-oil, till he had taken six drachms of it; after which he went on with 100 drops daily of vinous spirit of fal ammoniac made with alkali.

One of those who took the vinegar fell sick the 33d day. He was immediately blooded, and vomited with ipecacuanha. This man was too strong to make experiments on by force: he refused every thing, and died the third day. His companion, an old man, began to be seized in the same manner: he was purged with salts, took the *marfule balsami Peruvian*, and drank lemonade. He recovered, and used afterwards 100 drops of spirit of fal ammoniac daily. This was the patient formerly mentioned, whose blood had the fetid smell.

The man who used the camphire fell sick the 33d day. He was thrice copiously blooded, was plunged forcibly into the coldest water for the space of two hours, and was nearly drowned. He was clystered with effect. He himself forced down, with incredible aversion and labor, a great quantity of drink; by which he vomited more than 50 times abundance of frothy slime. He took several ounces of oil, and several boluses of castor and opium, of each four grains, without effect; and died the fourth day.

A girl who used the musk with cinnabar, fell ill the 62d day, and died the third day after. No farther attempt was made to save her life, she being then at a distance. Her companion, a pregnant woman, then left off the musk, and took in its stead vinous spirit of fal ammoniac.

A woman who had taken nothing, fell ill on the 40th day. She suffered terribly in the night, but less in the day-time. Besides the usual symptoms, she had great pain and swelling in her belly. In the space of two days she drank about two bottles of brandy, but would taste no other liquor. The Doctor ordered her to mix an equal quantity of oil with her brandy, and to take every day two boluses of castor and opium. She recovered; and at last took two doses

PRACTICE doses of turbith-mineral, by which she was vomited and purged.

After the 80th day, all the surviving people took thrice the turbith-mineral, except the pregnant woman; and they afterwards continued their alkaline medicines to the 100th day.

On these cases Dr Wolf makes the following observations.—“Thus we see, that the bark, the mercury, the acids, the mull, the feeding on the most famous herbs, the sweating, the *cura antiplogistica*, are no specifics. I don't know what to say to the alkalis: the danger is not yet over; and there are still four people who used nothing, in as good health as my patients.”

The following case by Dr Raymond of Marfeilles, shews the inefficacy of mercury even as a *preventative*.—On the 19th of July 1765, Mr Boyer, aged 25, of a bloated cachectic habit, was bit by a mad dog in the inferior part of the leg: the wound extended half way round, bled freely, and was like a great scratch. The patient's legs had been swelled for a considerable time before the accident; and there were also two ulcers in the other leg. Some hours after the accident, the actual cautery was applied to the wound. The Dr was not present at this operation; but the part around the bite was rubbed with mercurial ointment immediately after, and the eschar was dressed with the same ointment. The eschar was separated on the first day, but the dressing was continued till the wound was cicatrified. The second day a bolus of four grains of turbith and eight grains of camphire was exhibited. This procured a considerable evacuation both by vomit and stool, and a spitting also came on. The third day the bitten leg was rubbed with mercurial ointment: in the space of a month the frictions were repeated five times on both legs, three drachms of mercurial ointment being used in each friction. During the same time the bolus was five times repeated; and this treatment kept up a slight salivation to the 40th day. The evening of the third day he took the *Tonguin medicine*, called also *Sir George Cobb's powder*, in a bolus; which vomited him briskly. This powder was repeated seven or eight times in the month, generally with the same effect. During the first seven or eight days he got four times, in the morning, a drachm of the *angallis flore puniceo*, fresh gathered and powdered. The 41st day, the turbith bolus was preferred for the seventh time; he was bathed in the sea, and continued the bathing for two days more. On the 74th he was seized with the distemper; and died on the 76th, seemingly suffocated or strangled, his mouth covered with slaver, and his face bloated. He lost his senses not above half a quarter of an hour before his death. The pulse was quiet the whole time. The Doctor says he has reason to suspect the wound was not well cauterized.

Another instance is mentioned, by the same author, of a pregnant woman bit by the same dog and on the same day with Mr Boyer, who was never seized with the distemper. She was treated in much the same manner with him, and salivated a little more. But she was bit through a shamoy leather shoe, which must necessarily have cleaned the animal's teeth of the poisonous saliva before they reached her skin, and to this we are naturally led to ascribe her safety. One of Dr Wolf's patients also was a pregnant woman, and

was not seized with the distemper. Perhaps women in a state of pregnancy may be less liable to this distemper than others.

The same author tells us, “there are many examples of the inefficacy of mercurial frictions. A surgeon of Marfeilles treated a girl about 12 years of age bit by a mad dog, with mercurial frictions; applying them as in the *lues venerea*: yet she died of the hydrophobia on the 55th day. Her wound was not cauterized.”

In the following case all the most powerful remedies were tried.—In the afternoon of the 29th of Aug. 1778, Dr Vaughan was called to a boy of eight years of age labouring under a hydrophobia. He had been bit on the wrist by a cat about a month before; of which the marks remained, but without any ulcer, or even the smallest appearance of inflammation. About the middle of the day before Dr Vaughan saw him, he began to complain of a pain in the part bitten, which ascended up the arm, and affected the temple on that side; soon after which he swallowed liquids with reluctance and difficulty. He was put into the warm bath for three quarters of an hour, during which time he was easier: he had a clyster of five ounces of fresh broth, and 30 drops of laudanum, injected immediately after his coming out of it; a liniment consisting of three drachms of strong mercurial ointment, with the same quantity of oil of amber, was rubbed upon the shoulders and back; two pills of a grain of flowers of zinc, and half a grain of *cuprum ammoniacale*, were taken every three or four hours; and a medicated atmosphere was prepared for him, by burning gum ammoniac in his room. As these remedies were not attended with any good effect, each dose of pills was ordered to contain two grains of *cuprum ammoniacale*, the same quantity of opium, three grains of flowers of zinc, and ten grains of *asafetida*; whilst a solution of that fetid gum, with a drachm of laudanum, was administered as a clyster. These pills, though repeated every four hours, afforded not the smallest relief, nor did they shew the least action on the frame. At last the Doctor resolved to put in practice the desperate remedy mentioned by Van Helmont, of throwing the patient into cold water, and keeping him there till he is almost drowned. With this view a large tub of cold water, well saturated with common salt, was prepared, into which the poor boy was plunged over head and ears, and there held until he ceased to struggle. He was then taken out again, and the same operation repeated until he became so quiet that the Doctor was under apprehensions that a total extinction of life would take place. He was then wrapped up in a blanket and put to bed, and he remained more quiet than he had formerly been; but all his former restlessness soon returned, his pulse sunk, and he died about two o'clock in the morning.

The last celebrated antidote against the poison of a mad dog hath been known for some years by the name of the *Ormskirk medicine*. The true composition of this is kept a secret by the proprietors: however, it hath been analysed, and the following composition published by Dr Heysham as perfectly similar to it in all respects.

“Take half an ounce of chalk, three drachms of Armenian bole, ten grains of alum, one drachm of elecampane in powder; mix them all together, and add six drops of oil of anise.”

They



They must certainly be very credulous who can put confidence in such an insignificant medicine as a preervative against the hydrophobia: however, there is a possibility that there may be some unknown ingredient in the genuine powder; for it is difficult to analyse powders after the ingredients are thoroughly mixed together. The efficacy of the medicine therefore must depend on the virtues of that unknown ingredient, if any such there is. The following cases, however, too well determine that it is not *infallible*, as was at first pretended.

On the 14th of February 1774, Mr Bellamy of Holborn, aged 40, was bit by a cat, which was killed the same morning. The following day he took the celebrated Ormskirk medicine, sold by Hill and Berry in Hill-Street, Berkeley Square, and conformed in every respect to the directions given by the vender. A servant-maid, who was bitten in the leg before her master was bitten, likewise took the same remedy. About the middle of April Mr Bellamy complained of a pain in his right knee, which he supposed to be rheumatic, and which continued and increased till the 7th of June, when he got some pills of calomel, ipecacuanha, and *pil. japon.* from an apothecary, with Huxham's tincture of the bark in small doses. In six days more he had a titillation in the urethra, a contraction of the scrotum and penis to a degree of pain, and an emission of semen after making water, to which he had frequent calls. The medicines were discontinued; and on the 16th of that month the hydrophobia came on, and Dr Fothergill was called. Six ounces of blood were taken from his arm, and a bolus of a scruple of native cinnaabar and half a scruple of mulf was given every four hours. The distemper manifestly increased thro' the day. In the evening a clyster was injected, and several times repeated during the night; he had been put into the warm bath, and two drachms of strong mercurial ointment rubbed into his legs and thighs by himself. He was greatly relieved by the warm bath while he continued in it, but the symptoms returned with increased violence in the night. The next day, being greatly worse, he was blooded to as great a quantity as he could bear, had the warm bath and clysters repeated, and half an ounce of mercurial ointment rubbed into his thighs and legs. Pills of opium were prescribed, but he did not take them. He died the same night, at half an hour after 12. This patient was a man of great resolution, and could in part conquer his aversion at water. He seemed to have totally forgot the accident of the bite; and casually said, that he thought this disorder resembled the hydrophobia, without supposing that he was afflicted with that distemper at the time.—The bite on the girl's leg refused to heal, baffled the art of a young surgeon who attempted to cure it, and continued a running ulcer for a long time. She did not fall into the hydrophobia. Hence Dr Fothergill thinks it probable, that keeping the wounds made by the teeth of mad animals open for a long time, would probably be of service as a preventative; but in some of Dr Wolf's patients, these artificial drains appear not to have been attended with success.

On the 16th of November 1773, Thomas Nourfe, a strong healthy boy of 14, was admitted into the Leicester infirmary; having been that day mouth bitten

by a mad fox-hound. The wound was a large lacerated one on the cheek, and bled very freely on being inflicted. The day after he was bit he went to the sea, where he was dipped with all the severity usually practised under so disagreeable an operation. The *Ormskirk medicine* was also administered with all due care. It was bought of the person in Leicester who is deputed by the proprietor to sell it for him. A common adhesive plaster was applied to the part after sea-bathing; and in the course of a month, without any further trouble, the wound was healed; excepting a small portion, somewhat more than an inch in length, and in breadth about one-tenth. This yielded no discharge, and was quite in a cicatrizing state. Five days before his admission into the infirmary, he began to complain of a tightness over his temples, and a pain in his head: in two days the hydrophobia began to appear; and at its commencement, he complained of a *boiling heat* in his stomach, which was continually ascending to the fauces. The disease was pretty strong when he came to the infirmary. He got a bolus of a scruple of mulf with two grains of opium; then a composition of 15 grains of mulf, one of turbit mineral, and five grains of opium, was directed to be taken once in three hours: an ounce of the stronger mercurial ointment was to be rubbed on the cervical vertebrae and shoulders, and an embrocation of two ounces of laudanum, and half an ounce of *acetum saturninum*, was directed to be applied to the throat. But by this last he was thrown into convulsions, and the same effect followed though his eyes were first covered with a napkin. The embrocation was therefore changed for a plaster of three drachms of powdered camphire, half an ounce of opium, and six drachms *confectio Democriti*. By these medicines the disease seemed to be somewhat suspended, but they returned with violence in the evening. His medicine was repeated at seven; and at eight, five grains of opium were exhibited without mulf or turbit. At nine, another ounce of mercurial ointment was rubbed upon the shoulders, and half an ounce of laudanum with six ounces of mutton-broth was injected into the intestines, but to no purpose. A larger dose of opium was then given, but with as little effect as the former, and he died the same night.

In the month of September 1774, a farmer, aged 25, was bit by a mad dog, whose teeth made a slight wound in the fore-finger of the left hand. He was dipped, as usual, in the sea; and drank the sea-water for some time on the spot, which operated briskly as a purge. He continued well till the 6th of June following, when he first felt a pain in that hand and arm; for which he bathed in a river that evening, supposing that it had been a rheumatic complaint. The next day he was sick; and in the evening was seized with a violent vomiting, which continued all that night and till the middle of the next day, when it was succeeded by the hydrophobia. He was treated with the warm bath; had a purgative clyster injected; and as soon as it had operated, a second was given, consisting of four ounces of oil, and half an ounce of laudanum: half an ounce of strong mercurial ointment was rubbed on the fauces, and the part was afterwards covered with the *cataplasma e cymino*, to which was added an ounce of opium. An embrocation was applied to the region of the stomach with continued friction, consisting of half an ounce

ounce of *sp. sal. ammoniac.* ten drachms of oil olive, six drachms of oil of amber, and ten drachms of laudanum. Two ounces of strong mercurial ointment were rubbed upon the shoulders and back; and as a further means of kindling a pyralism speedily, he received the smoke of cinabar into the mouth by throwing a drachm of that substance now and then upon a hot iron: he was also directed to take every four hours a bolus of 15 grains of muls, three grains of turbit mineral, and four grains of opium. He was easier while in the warm bath, and during the application of the ointment; but died the same night about two o'clock.

Many other instances might be adduced of the inefficacy of this pretended specific: the danger of acquiescing in which, will, it is hoped, create a due degree of caution in those to whom they who are so unfortunate as to be bit by a mad animal may commit themselves. Of the great variety of remedies which have had their day of reputation, there is not one which has not possessed the credit, some time or other, of preventing the noxious effects arising from the bite of a mad dog. A more adequate experience has with all of them discovered the deception. It was above observed, that the hydrophobia is by no means the infallible consequence of being bit by a mad animal; and that of between 20 and 30 persons who were bit by the dog which gave the fatal wound to one of Dr Vaughan's patients, not one felt the least ill effect but himself. "In the above number (says the Doctor) were some who took the Ormskirk Medicine; others went to the salt-water; and a part of them used no remedy, who yet fared equally well with the most attentive to their injury. The same thing has often happened before; and much merit, I doubt not, has been attributed to the medicine taken, from that celebrated one of *Sir George Cobb*, down to the infallible one which my good *Lady Bountiful's* receipt-book furnishes."

From all that has been said the reader will judge how far the hydrophobia is capable of being subdued by any of the medicinal powers which have yet been tried. Some eminent physicians assert that it is totally incurable; and allege that the instances recorded by different authors of its cure have not been the genuine kind, but that which comes on spontaneously, and which is by no means so dangerous. Indeed two of Dr Wolf's patients recovered, where the disease seems to have been perfectly genuine: but in these the poison seemed to vent itself partly on some other place besides the nervous system. In one the blood was evidently infected, as it had an abominable fetor; and the other had a violent pain and swelling in the belly. In all the others, it seemed to have attacked only the nervous system; which perhaps hath not the same ability to throw off any offending matter that the vascular system hath.

There is, however, a possibility that the prodigious affections of the nerves may arise only from a vitiated state of the gastric juices; for it is well known, that the most terrible convulsions, nay, the hydrophobia itself, will arise from an affection of the stomach, without any bite of a mad animal. This seems to be somewhat confirmed from one of Dr Wolf's patients, who, though he vomited more than 50 times, yet still

threw up a frothy matter, which was therefore evidently secreted into the stomach, just as a continual vomiting of bilious matter shews a continual and extraordinary secretion of bile. Dr Wolf himself adopts this hypothesis so far as to say, that perhaps the serum may become frothy; but in blood drawn from a vein not the least fault appears either in the serum or crassamentum. He affirms, however, that the duodenum appears to be one of the parts first and principally affected; and as it is not inflamed, it would seem that the affection it sustains must arise from the vitiated state of its juices.

Be this as it will, however, in the hydrophobia, the stomach seems totally, or in a great measure, to lose the power which at other times it possesses. Two grains of *cuprum ammoniacale* were repeatedly given to a child of eight years of age without effect; but this dose would occasion violent vomiting in a strong healthy man. Something or other therefore must have prevented this substance from acting on the nervous coat of the stomach; and this we can only suppose to have been the exceedingly disordered state of the gastric juice, which occasioned such violent irritation through the whole body, that the weaker stimulus of the medicine was entirely lost. It would seem proper therefore to consider the stomach in hydrophobic cases as really containing a poisonous matter, which could not be expelled by vomiting, because it is renewed as fast as evacuated. The indication therefore must be, to change its nature by such medicines as are certainly more powerful than the poison; and this indication will naturally lead us to think of large doses of alkaline salts. These, it is certain, will destroy any animal-substance with which they come in contact, and render even the poison of serpents inactive. By exhibiting a few doses of them, larger no doubt than what could be safely done on other occasions, we would be certain to change the state of the stomachic juices; and thus might free the patient from those intolerable spasms which always occasion death in such a short time. Dr Wolf seems inclined to think that volatile alkalies were of service; but the above hypothesis would incline us to use rather the fixed kind. At any rate, it seems vain for physicians to trust much to the power of opium, mercury, muls, or cinabar, either singly, or combined in any possible way. The bark hath also failed, and the most celebrated specifics have been found ineffectual. Alkalies are the next most powerful remedies which the *materia medica* affords, and they cannot be more unsuccessful than the others have generally been.

Another remedy which seems adapted to change the nature of the gastric juices is ardent spirits. In one of Dr Wolf's patients two bottles of brandy seem to have effected a cure. The oil mixed with it was of no efficacy in other cases, and the opium and turbit seem not to have been exhibited till the worst was past. In this case the disease seems to have attacked the vascular as well as the nervous system.

In all the patients the warm bath seems to have been a palliative, and a very powerful one, and as such it ought never to be omitted, though we can by no means trust to it as a radical cure; and the above histories abundantly shew, that though the warm bath

and opium may palliate for a short time, the cause on which the spasms depend is still going on and increasing, till at last the symptoms become too strong to be palliated even for a moment by any medicine however powerful. At any rate, the abovementioned hypothesis suggests a new indication, which, if attended to, may perhaps lead to useful discoveries. In cases where putrescent bile is abundantly secreted, colombo root and vegetable acids are recommended to change the nature of the poison which the body is perpetually producing in itself. Where corrosive mercury hath been swallowed, alkaline salt is recommended to destroy the poison which nature cannot expel by vomiting; and why should not something be attempted to destroy the poison which the stomach seems to secrete in the hydrophobia, and which nature attempts to expel, though in vain, by violent efforts to vomit?

But whatever plan may be pursued in the hopes of curing this dreadful malady after any of the symptoms have made their appearance, we ought, in every instance of the accident that gives rise to it, direct our immediate care to *prevention*, as being perhaps the only real ground of hope: And the most certain and efficacious way of preventing the ill consequences, is instantly (if it may be done) to cut out out the piece in the place that happens to be bitten. Dr James, indeed, says, that he would have little opinion of cutting or cauterising if ten minutes were suffered to elapse from the receiving of the bite before the operation was performed. But in an inaugural dissertation lately published at Edinburgh by Dr Parry, the author is of opinion that excision will be of use a considerable time after the bite is received. He adopts this opinion from what happens in the small-pox, where the blood doth not seem to receive the infection till some days after inoculation hath been performed. A second inflammation, he tells us, then takes place, and the infection is conveyed into the blood. In like manner, when the hydrophobous infection is about to be conveyed into the blood, according to him, the wound, or its cicatrix, begins again to be inflamed; and it is this second inflammation which does all the mischief. Excision, or the cautery, will therefore be effectual any time betwixt the bite and the second inflammation of the wound. Without implicitly trusting to this doctrine, however, or considering it as in any degree ascertained in what manner the poison diffuses itself, by what marks its progress may be known, or how soon the system may be irretrievably tainted with its malignity, it is undoubtedly safest not to lose unnecessarily a moment's time in applying the knife. This, or a dilation of the wound if it be small, Dr Vaughan considers as the only prophylactics that can be depended upon. In the latter case, he directs to fill the wound with gunpowder, and set fire to it; which would produce a laceration of the part, and possibly the action of ignited powder upon the poison may have its use.

CLII. The *Spontaneous HYDROPHOBIA*. Sp. II.  
Hydrophobia spontanea, *Sauv.* sp. 2.

This disease very much resembles the former, so that it has undoubtedly been often mistaken for it. It has been known to come on in an inflammation of the stomach, where it was cured by repeated and large blood-letting; in hysteria, where it was cured by o-

pium, muls, or other antispasmodics; and in putrid fevers, where it was cured by evacuating the intestinal canal of the putrid matters by repeated clysters. A very good method of distinguishing the two is, that in the spontaneous hydrophobia the patient is much more delirious than in the genuine species. In the instance mentioned in the Medical Essays of this symptom attending the inflammation of the stomach, the patient *raved in the most extraordinary manner*. Dr Raymond says he remembers a spontaneous hydrophobia attended with *madness*; and in almost all the cases of hydrophobia which are said to have been cured, the patient was very delirious. Dr Nugent's patient was very frequently delirious, and dreaded *dogs* as well as water. In the Medical Transactions a case is communicated by W. Wrightson surgeon in Sedgfield, Durham, of *canine madness* successfully treated. This madness indeed came on after the bite of a dog said to be mad: but it appeared only four days after the accident happened, and was attended with symptoms very unlike any of those abovementioned; for he suddenly started up in a fit of delirium, and ran out of the house, and after being brought in caught hold of the hot bars of the grate which held the fire: Whereas, in the true hydrophobia, the patients dread the fire, light, or any thing which makes a strong impression on the senses, exceedingly. It is probable, therefore, that this was only a spontaneous hydrophobia, especially as it readily yielded to venesection, 30 drops of laudanum, and pills of a grain and an half of opium given every three hours, some boluses of muls and cinnamon, &c. while in some of the former cases as much opium was given to a boy as would have deprived of life the strongest healthy man had he swallowed it; and yet this amazing quantity produced scarce any effect. This patient also dreaded the sight of a dog.

ORDER VI. VESANIÆ.

- Paranoïa, *Vog.* Clafs IX.
- Deliria, *Sauv.* Clafs. VIII. Ord. III. *Sag.* Clafs XI. Ord. III.
- Ideales, *Lin.* Clafs V. Ord. I.

CLIV. AMENTIA; FOLLY, or *Idiotism*.  
Genus LXV.

427

- Amentia, *Sauv.* gen. 233. *Vog.* 337. *Sag.* 346. *Morosis*, *Lin.* 106.
- Stupiditas, morosis, fatuitas, *Vog.* 336.
- Amnesia, *Sauv.* gen. 237. *Sag.* 347.
- Oblivio, *Lin.* 107. *Vog.* 338.
- Memorie debilitas, *Junch.* 120.

CLV. MELANCHOLIA, MELANCHOLY *Madness*.  
Genus LXVI.

428

- Melancholia, *Sauv.* gen. 234. *Lin.* 71. *Vog.* 332. *Sag.* 347. *Boerb.* 1089. *Junch.* 121.
- Dæmonomania, *Sauv.* gen. 236. *Sag.* 348.
- Dæmonia, *Lin.* 69.
- Vesania, *Lin.* 70.
- Paraphobia, *Lin.* 75.
- Athymia, *Vog.* 329.
- Delirium melancholicum, *Hoffm.* III. 251.
- Erotomania, *Lin.* 82.

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Nostalgia, *Sauv. gen.* 226. *Lin.* 83. *Sag.* 338.

*Junck.* 125.

Melancholia nervæ, *Cl. Lorry* de melancholia, P. I.

429 CLVI. MANIA, RAVING or FURIOUS *Madness*.  
Genus LXVII.

Mania, *Sauv. gen.* 235. *Lin.* 68. *Vog.* 331. *Sag.* 340. *Boerb.* 1118. *Junck.* 122. *Battie* on Madnes.

Paraphrolyse, *Lin.* 66.

Amentia, *Lin.* 67.

Delirium maniacum, *Hoffm.* III. 251.

ALTHOUGH these distempers may be considered as distinct genera, yet they are so nearly allied, and so readily change into each other, that it sufficiently justifies the treating of them all at once.

The distinguishing characteristic of madness, according to Dr Battie, is a *false perception*; and under this general character may be comprehended all kinds of what is called *madness*, from the most silly stupidity and idiotism to the most furious lunacy. Frequently the different kinds of madness are changed into each other by the casual excitement of some passion: thus, an idiot may become furiously mad, by being put in a violent passion; though this does not so often happen as the change of melancholy into the raving madness, and *vice versa*.

It is a very surprising circumstance, that mad people are not only less liable to be seized with infectious disorders than those who are in perfect health, but even when labouring under other diseases, if the patients chance to be seized with madness, they are sometimes freed from their former complaints. Of this kind Dr Mead relates two very remarkable instances.

On the other hand, it has been known, that an intermittent fever, supervening madness of long standing, has proved a cure for the madness; the senses having returned, when the fever terminated. Dr Monro saw two instances of this himself; and mentions it as an observation of his predecessor in the care of Bethlehem hospital.

Another remarkable circumstance is, that immoderate joy, long continued, as effectually disorders the mind as anxiety and grief. For it was observable in the famous South-Sea year, when so many immense fortunes were suddenly gained, and as suddenly lost, that more people had their heads turned, from the prodigious flow of unexpected riches, than from the entire loss of their whole substance.

Mad people, especially of the melancholic kind, sometimes obstinately persevere in doing things which must excite great pain; whence it should seem as if their minds were troubled with some distracting notions, which make them patiently bear the present distress, lest more severe tortures should be inflicted; or possibly they may think, that, by thus tormenting the body, they render themselves more acceptable to the divine Being, and expiate the heinous sins of which they may imagine themselves to have been guilty.

*Cure, &c.* All the species and degrees of madness which are hereditary, or that grow up with people from their early youth, are out of the power of physic; and so, for the most part, are all maniacal cases of more than one year's standing, let them arise from what source so-

ever. Very often, mere waste, or the dregs of some particular disease, such as an ague, the small-pox, or a nervous fever, shall occasion different degrees of foolishness, or madness. In these cases, the cure must not be attempted by evacuations; but, on the contrary, by nourishing diet, clear air, moderate exercise, and the use of wine: whereas, in almost all the other maniacal cases which arise from different sources, and which come on in consequence of intemperate living, violent passions, or intense thinking, it is generally held, that evacuations of every kind are necessary, unless the constitution of the patient be such as absolutely forbids them.

Blood is most conveniently drawn either from the arm or jugulars; and if the weakness be such as renders it improper to take away much blood, we may apply cupping-glasses to the occiput.

Vomiting, in weakly people, must be excited by the vinum ipecacuanæ; but, in the more robust, by emetic tartar, or antimonial wine: the most efficacious cathartics, are the infusion or tincture of black hellebore, or infusion of senna, quickened with tincture of jalap; but if there be suppression of the menses, or hæmorrhoidal discharge, then aloetic purges will be more proper. In general, mad people require very large doses, both of the emetics and cathartics, before any considerable operation ensues.

Dr Monro assures us, that the evacuation by vomiting is infinitely preferable to any other: the prodigious quantity of phlegm, with which the patients in this disease abound, he says, is not to be got the better of but by repeated vomits; and he observes, that the purges have not their right effect, or do not operate to so good purpose, until the phlegm is broken and attenuated by frequent emetics. He mentions the case of a gentleman who had laboured under a melancholy for three years, from which he was relieved entirely by the use of vomits, and a proper regimen. Increasing the discharge by urine, is also of the greatest moment, especially when any degree of fever is present. The cutaneous discharges are also to be promoted, for which purpose the hot bath is of the highest service in maniacal cases. Hoffman asserts, that he has seen numerous instances, both of inveterate melancholy and raging madness, happily cured by means of warm bathing; bleeding and nitrous medicines having been premised. Camphor has also been highly commended; but, if we believe Dr Locker of Vienna, not very deservedly. Having found very good effects from a solution of this medicine in vinegar, he took it for granted that all the success was owing to the camphor; therefore, in order to give it a fair trial, he selected seven patients, and gave it in large doses of half a drachm twice a-day. This was continued for two months, and the doctor was surprised to find that only one of his patients received any benefit. He then returned the other six back to the camphorated julep made with vinegar, and in a few weeks four of them recovered the use of their reason. This inclined him to think that the virtue depended solely on the vinegar, and accordingly he began to make the trial. Common vinegar was first given: but after a little while he fixed on that which had been distilled, and gave about an ounce and half of it every day; the patients having been previously prepared by bleeding and pur-

ging,

ging, which was repeated according as it was found necessary. He gives a list of eight patients who were cured by this method; some in six weeks, others in two months, and none of them took up more than three months in perfecting the cure. He does not indeed give the ages of the patients, nor mention the circumstances of the case; only says, they began the vinegar such a day, and were discharged cured on such another day; and he adds, that they all continued well at the time of his writing.

Dr Locker informs us, that this medicine acts chiefly as a sudorific; and he observed, that the more the patients sweated, the sooner they were cured: it was also found to promote the menstrual discharge in such as had been obstructed, or had too little of this salutary evacuation.

Both reason and experience shew the necessity of confining such as are deprived of their senses; and no small share of the management consists in hindering them to hurt themselves, or do mischief to other persons. It has sometimes been usual to chain and to beat them: but this is both cruel and absurd; since the contrivance called the *strait waistcoat* answers every purpose of restraining the patients, without hurting them.

These waistcoats are made of ticken, or some such strong stuff; are open at the back, and laced on like a pair of stays; the sleeves are made tight, and long enough to cover the ends of the fingers, where they are drawn close with a string, like a purse, by which contrivance the patient has no power of his fingers; and, when laid on his back in bed, and the arms brought across the chest, and fastened in that position by tying the sleeve-strings round the waist, he has no use of his hands. A broad strap of girth-web is then carried across the breast, and fastened to the bedstead, by which means the patient is confined on his back; and if he should be so outrageous as to require further restraint, the legs are secured by ligatures to the foot of the bed.

It is of great use in practice to bear in mind, that all mad people are cowardly, and can be awed even by the menacing look of a very expressive countenance; and when those who have charge of them once impress them with the notion of fear, they easily submit to any thing that is required. The physician, however, should never deceive them in any thing, but more especially with regard to their distemper: for as they are generally conscious of it themselves, they acquire a kind of reverence for those who know it; and by letting them see that he is thoroughly acquainted with their complaint, he may very often gain such an ascendancy over them that they will readily follow his directions.

It is a more difficult matter to manage those whose madness is accompanied either with excessive joy, or with great dejection and despondency, than those who are agitated with rage: and all that can be done is to endeavour to excite contrary ideas, by repressing the immoderate fits of laughter in the one kind by chiding or threatening, (taking care, however, not absolutely to terrify them, which can never be done without danger, and has often added to the misery of the unhappy sufferer); and dispelling the gloomy thoughts in the other, by introducing pleasing concerts of music,

or any other species of entertainment which the patients have been known to delight in while they had the use of their reason.

Though blistering the head has generally been directed, Dr Mead says he has oftener found it to do harm than service: but he recommends issues in the back; and advises to keep the head always close shaved, and to wash it from time to time with warm vinegar. Opium is usually forbidden in maniacal cases, as supposing that it always increases the disturbance; but there are instances where large doses of this medicine have been found to prove a cure, and perhaps if it were tried oftener we should find powerful effects from it: there certainly cannot much harm ensue from a few doses, which may be immediately diffused if they should be found to exasperate the disease.

The diet of maniacal patients ought to be perfectly light and thin: their meals should be moderate; but they should never be suffered to live too low, especially while they are under a course of physic: they should be obliged to observe great regularity in their hours; even their amusements should be such as are best suited to their disposition; and after the disease appears to be subdued, chalybeate waters and the cold bath will be highly proper, to strengthen their whole frame, and secure them against a relapse.

#### CLVIII. ONEIRODYNIA, UNEASINESS in SLEEP. Genus LXVIII.

430

Somnium, *Vog.* 339.

Somnambulismus, *Sauv.* gen. 221. *Lin.* 77. *Sag.*

333.

Hypnobotaxis, *Vog.* 340.

Noctambulation, *Junck.* 124.

Ephialtes, *Sauv.* gen. 138. *Lin.* 163. *Sag.* 245.

Incubus, *Vog.* 211. *Junck.* 50.

THE greatest uneasiness which people feel in sleep, is that commonly called the *incubus* or *night-mare*. Those seized with it seem to have a weight on their breasts and about their precordia. Sometimes they imagine they see spectres of various kinds which oppress or threaten them with suffocation. Neither does this uneasiness continue only while they are asleep; for it is some time after they awake before they can turn themselves in their beds or speak; nay, sometimes, though rarely, the distemper hath proved mortal.—The *incubus* rarely seizes people except when the stomach is oppressed with aliments of hard digestion, and the patient lies on his back. It is to be cured by eating slight suppers, and raising the head high; or, if it become very troublesome, antispasmodic medicines are to be administered, and the body strengthened by chalybeates. The same method is to be followed by those who are subject to walking in their sleep; a practice which must necessarily be attended with the greatest danger.

## CLASS III. CACHEXIAÆ.

Cachexia, *Sauv.* Clafs X. *Sag.* Clafs VIII. *Sag.* Clafs III.

Deformes, *Lin.* Clafs X.

## ORDER I. MARCORES.

Macies, *Sauv.* Clafs X. Order I. *Sag.* Clafs III. Order I.

Emaciantes, *Lin.* Clafs X. Order I.

431 CLIX. TABES, or WASTING of the Body.  
Genus LXIX.

Tabes, *Sauv.* gen. 275. *Lin.* 209. *Vog.* 306. *Sag.* 100.

THIS disorder is occasioned by the absorption of pus from some ulcer external or internal, which produces an hectic fever. The primary indication therefore must be to heal the ulcer, and thus take away the cause of the disease. If the ulcer cannot be healed, the patient will certainly die in an emaciated state. But for the proper treatment of the parts proceeding from this cause, see below, ULCER, SYPHILIS, SCROPHULA, SCURVY, &c. also the article SURGERY.

432 CLX. ATROPHY, or NERVOUS CONSUMPTION.  
Genus LXX.

*Description.* THIS is a wasting of the body, without any remarkable fever, cough, or difficulty of breathing; but attended with want of appetite, and a bad digestion, whence the whole body grows languid, and wastes by degrees.—Dr Cullen, however, asserts, that some degree of fever, or at least of increased quickness of the pulse, always attends this disease.

*Causes.* Sometimes this distemper will come on without any evident cause. Sometimes it will arise from passions of the mind; from an abuse of spirituous liquors; from excessive evacuations, especially of the semen, in which case the distemper hath got the name of *tabes dorsalis*. It will arise from mere old age, or from famine.

*Prognosis.* This distemper, from whatever cause it may arise, is very difficult to cure, and often terminates in a fatal dropy.

*Cure.* Stomachic and nervous medicines are only to be depended upon in this case. The Peruvian bark, elixir of vitriol, and chalybeates, are excellent; and the diet should be as light and nutritive as possible. In that species of the distemper occasioned by venereal excesses, it is so essentially necessary to abstain from them, that without it the best remedies will prove useful. But this is so seldom complied with, that the *tabes dorsalis* almost always proves mortal.

## ORDER II. INTUMESCENTIAÆ.

Intumescens, *Sauv.* Clafs X. Ord. II. *Sag.* Clafs III. Ord. II.

Tumidoli, *Lin.* Clafs X. Ord. II.

433 CLXI. POLYSARCIA, or CORPULENCY.  
Genus LXXI.

Polysarcia, *Sauv.* gen. 279. *Lin.* 213. *Vog.* 540. *Sag.* 160. Steatitis, *Vog.* 390.

IN a natural and healthy state, the fat, or animal oil, is not allowed to diffuse itself throughout the cellular interstices at large, but is confined to the places where such an oily fluid is necessary, by a particular apparatus of distinct vesicles. But in many constitutions the oily part of the blood appears to exceed the requisite proportion, and easily separates from the other constituent parts; and then it is apt to accumulate in such quantities, that we may suppose it to burst those vesicles which were originally destined to hinder it from spreading too far.

The increase of the omentum particularly, and the accumulation of fat about the kidneys and mesentery, swell the abdomen, and obstruct the motions of the diaphragm; whence one reason of the difficulty of breathing which is peculiar to corpulent people; while the heart, and the large vessels connected therewith, are in like manner so encumbered, that neither the systolic nor subulatory motion can be performed with sufficient freedom, whence weakness and slowness of the pulse: but when the whole habit is in a manner overwhelmed with an oily fluid, the enlargement of the cellular interstices will necessarily interrupt the general distribution and circulation throughout the nervous and vascular systems; impeding the action of the muscular fibres, and producing insensibility, somnolency, and death.

These cases are the more deplorable, as there is but little prospect of a cure. For the animal oil is of too gross a nature to be easily taken up by absorption; and we know, that when fluids are accumulated in the cellular system, there are only two ways in which they can be carried off or escape; namely, by the absorbents, which take their rise from the cellular interstices, and through the pores of the skin by transudation.

Another misfortune is, that the disease steals on so imperceptibly, that it becomes inveterate by the time that people begin to think of pursuing the proper means of relief.

Soap has been proposed as a remedy to melt down and facilitate the absorption of the fat in corpulent people; and Dr Fleming some years ago published a little treatise, wherein he recommends this medicine, and relates the case of a gentleman who is said to have received considerable benefit from it. But perhaps the soap-les would be more powerful, and might be more easily taken, sheathed, as hereafter directed when recommended as a solvent of the stone.

Licentaud advises to take *acetum scilliticum* in small doses, with frequent purging and brisk exercise. But it will seldom happen that the patients will be found sufficiently steady to persist in any of these courses, it being the nature of the disorder to render them irrefolute and inattentive to their condition. Therefore the principal use of rules must be with a view to prevention; and persons who are disposed to corpulency should take care in time to prevent it from becoming an absolute disease, by using a great deal of exercise, not indulging in sleep, and abridging their meals, especially that of supper. Salted meats are less fattening than such as are fresh; and drinking freely of coffee is recommended to corpulent people.

But Dr Fothergill observes, that a strict adherence to vegetable diet reduces exuberant fat more certainly than



than any other means that he knows of; and gives two cafes wherein this regimen fucceeded remarkably well. The famous Dr Cheyne brought himfelf down in this way, from a molt unweildy bulk, to a reafonable degree of weight; as he himfelf informs us. See CHEYNE.

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## CLXII. PNEUMATOSIS, EMPHYSEMA, or Windy Swelling. Genus LXXII.

Pneumatosis, *Sauv. gen. 280. Vog. 391 Sag. 107. Emphysema. Sauv. gen. 13. Lin. 288. Vog. 392. Leucophlegmatia, Lin. 214.*

THE emphysema fometimes comes on spontaneously; but more frequently is occafioned by wounds of the lungs, which giving vent to the air, that fluid infiltrates itfelf into the cellular texture, and often blows it up to a furprizing degree. It muft be obferved, however, that it is only in cafes of laceration of the lungs where this difeafe can take place; for in a fimple wound, the effufion of blood always prevents the air from getting out. The cure is to be accomplished by the fcarifications and compreffes, and in fome cafes only by the paracentefis of the thorax. See SURGERY.

435

## CLXII. TYMPANITES, the TYMPANY. Genus LXXIII.

Tympanites, *Sauv. gen. 291. Lin. 219. Vog. 316. Sag. 118. Boerh. 226. Junck. 87. Affectio tympanitica, Hoffm. III. 339. Meteorismus, Sauv. gen. 292.*

THIS is an inflation of the abdomen, and is of two kinds: 1. That in which the flatus is contained in the inteftines, in which the patient has frequent explosions of wind, with a fwelling of the belly frequently unequal. 2. When the flatus is contained in the cavity of the abdomen; in which cafe the fwelling is more equal, and the belly founds when struck, without any confiderable emission of flatus. In both cafes the reft of the body falls away.

*Caufes, &c.* The tympany fometimes takes place in thofe who have been long troubled with flatulencies in the ftomach and inteftines. It happens frequently to women after abortion; to both fexes after the fuppreffion of the hæmorrhoids; and fometimes from tedious febrile diforders injudiciously treated.

*Prognofis.* This difeafe is generally very obftinate, and for the moft part proves fatal by degenerating into an afcites. Sometimes, if the patient be healthy and ftrong, the difeafe may terminate favourably, and that the more readily if it has followed fome other diforder. A hectic confumption, dry cough, and emaciated countenance in a tympany, with a fwelling of the feet, denote approaching death in a very fhort time.

*Cure.* The cure of the tympany is to be attempted by carminative, refolvent, and ftomachic medicines, gentle laxatives, and at laft tonics, efpecially chalybeates. In the Edinburgh Medical Effays, Vol. I. we have a very remarkable hiftory of a tympany by Dr Monro fenior. The patient was a young woman of 22 years of age, who fell into the diftemper after having a tertian ague in which fhe was badly treated. She became a patient in the Edinburgh Infirmary the

24th of March 1730; took feveral purgatives, fome dofes of calomel; ufed the warm bath; and had an antihyfteric plafter applied over the whole belly, but with very little effect. She was monftroufly diffided, infomuch that the fkin feemed to be in danger of burfting; her breathing was much ftraightened; and the fwelling gradually decreafed without any evacuation. The returns and degree of this fwelling were very uncertain; and when the belly was molt detumefied, feveral unequal and protuberant balls could be felt over the whole abdomen, but efpecially at its fides. Her ftomach was good, fhe had no thirft, and her urine was in proportion to the quantity fhe drank. She was very cofive, had her menfes at irregular periods, but no œdematous fwellings appeared in the feet or any where elfe. In this fituation fhe continued from the time of her admiffion till the 21ft of June, during which interval fhe had only her menfes twice. Throughout this fpace of time it was obferved, 1. Several times, upon the falling of the fwelling, fhe complained of a headach; once of pains throughout all her body, once of a giddinefs, twice of a naufea and vomiting, and the laft time threw up green bile; and once her ftomach fwelled greatly, whilft the reft of the abdomen fubfided. 2. During the flowing of the menfes fhe did not fwell, but became very big upon their ftopping. 3. Bleeding and emetics, which were made ufe of for fome accidental urgent fymptoms, had no very fenfible effect in making the tympany either better or worfe. 4. She never had paffage of wind either way, except a little belching fome days before the firft monthly evacuation.

Some time before the laft eruption of the menfes the purgatives were given more fparingly, and the dofes of the antihyfterics of the ftrongeft kind, fuch as affaæetida, oleum C. C. &c. mixed with foap, were given in large dofes, accompanied with the hotter antifeorbutics as they are called, as horfe-radish and ginger-root infufed in ftrong-ale with fteel. The patient was ordered to ufe frequent and ftrong frictions to all the trunk of her body and extremities, and to ufe moderate exercife. Immediately before the menftrua began to flow, clyfters of the fame kind of medicines were injected. The menfes were in fufficient quantity; but as foon as they ceafed, her belly increafed in its circumference four inches and a half, but foon fubfided. She then complained of pains, which a gentle fweat carried off. Borborygmi were for the firft time obferved on the fame day, June 25th; and having taken fome *tinctura facra* at night, fhe paffed a fmall quantity of blood next day by stool. This was the firft appearance of the return of the hæmorrhoids, to which fhe had been formerly fubject.

The two following days her faponaceous, antihyfteric, and antifeorbutic medicines being ftill continued, fhe had fuch explosions of wind upwards and downwards, that none of the other patients would remain in the fame room, nay fcarce on the fame floor with her. Her belly became lefs, and fofter than it had been from the firft attack of the difeafe; her medicines, with a dofe of fyrup of buckthorn at proper intervals, ftill were continued, only the proportion of fteel was increafed; her ftatulent difcharge went on fuccefffully, and fhe gradually recovered her former health.

## CLIV. PHYSOMETRA, or WINDY SWELLING of the Uterus. Genus LXXIV.

Physometra, *Sauv.* gen. 290. *Sag.* 119.Hyterophyle, *Vog.* 317.

The treatment of this is not different from that of the tympany.

## 437 CLV. ANASARCA, or WATERY SWELLING over the Whole Body. Genus LXXV.

Anasarca, *Sauv.* gen. 281. *Lin.* 215. *Vog.* 313.*ag.* 108. *Boerh.* 1225. *Hoffm.* III. 322. *Funk.*87. *Monro* on the Dropsy. *Milman* Animad-

versiones de hydropoe 1779.

Phlegmatia, *Sauv.* gen. 282.Angina aquosa, *Boerh.* 791.

In this disease the feet first begin to swell, especially in the evening, after exercise, and when the patient has stood or sat long; which swelling rises frequently to the thighs. By lying in bed, the swelling becomes less, or even almost disappears. In the progress of the disease, the swelling often rises to the hips, loins, and belly, and at last covers the whole body. This disease, besides the other symptoms hereafter mentioned under ASCITES, is attended with a remarkable difficulty of breathing.—For the cure, see ASCITES.

438 Only it may be here noticed, that in anasarca it is usual to scarify the feet and legs. By this means the water is often discharged: but the operator must be cautious not to make the incision too deep; they ought barely to penetrate through the skin; and especial care must be taken, by spirituous fomentations and proper digestives, to prevent a gangrene. Dr Fothergill observes, that the safest and most efficacious way of making these drains is by the instrument used for cupping, called a *scarificator*; and he always orders it to be so applied as to make the little wounds transverse; and as they not only discharge better, but are also longer in healing, than when made longitudinally.

## CLXIV. HYDROCEPHALUS, or WATER in the Head. Genus LXXVI.

Hydrocephalus, *Sauv.* gen. 285. *Lin.* 216. *Boerh.* 1217.Hydrocephalum, *Vog.* 384.

This differs from the hydrocephalus formerly mentioned, as the water is collected in the external parts of the head, whereas the former is entirely within the skull. In the fifth volume of the Medical Observations we have an account of a very extraordinary case of this kind. The patient was a child only of a few days old, and had a tumour on his head about the size of a common tea-cup, which had the appearance of a bladder distended with water; near the apex was a small opening, through which a bloody serum was discharged. In other respects the child was healthy. No application was used but a piece of linen dipt in brandy. The tumour continued to increase for many months; at the end of which time the membrane containing the water appeared equally thick with the other part of the scalp, except one place about the size of a shilling, which continued thin, and at times appeared as if it would burst. He continued in this situation for about 17 months, when the circumference of

the head was 20 inches, the base 16½, the middle 18½, and from the base to the apex near 2½. The water was then drawn off, and the child died in two days. Almost all other cases of this distemper have proved fatal; the futures of the skull generally give way, and the whole external part of the head is equally enlarged; but in the instance just now given there was a deficiency of part of the bone.

CLXX. HYDRORACHITIS, or SPINA BIFIDA. 439  
Genus LXXVII.Hydrorachitis, *Sauv.* gen. 287. *Morgagn.* defed.XII. 9. *et seq.*Spinola, *Lin.* 289.Spina bifida, *Vog.* 386.CLXVI. HYDROTHORAX, or DROPSY of the 440  
Breaſt. Genus LXXVIII.Hydrothorax, *Sauv.* gen. 150. *Vog.* 311. *Boerh.* 1219.

For these two diseases. See the article SURGERY.

## CEXVII. ASCITES, or DROPSY of the Abdomen. Genus LXXIX. 442

Ascites, *Sauv.* gen. 288. *Lin.* 217. *Vog.* 314.*Sag.* gen. 115. *Boerh.* 1226. *Hoffm.* III. 322.*Funk.* 87. *D. Monro* on the Dropsy, 1765.*Milman*, Animadversiones de hydropoe, 1779.

*Description.* THIS disease assumes three different forms: 1. When the water immediately washes the intestines. 2. When it is interposed between the abdominal muscles and peritonæum; or, 3. It may be contained in sacs and hollow glands, in which case it is called the *encysted dropsy*. Some physicians of great reputation have asserted, that the water was often placed within the duplicature of the peritonæum: but this is alleged by Dr Milman to be a mistake, as that membrane is looked upon by the best anatomists to be single; and he thinks that the abovementioned physicians have been led into the mistake from observing the water collected in the cellular substance of the peritonæum.

In the beginning of an ascites the patient becomes languid, breathless, and hath an aversion at motion: his belly swells; and when struck, the sound of fluctuating water is perceptible; there is a difficulty of breathing when the belly is pressed. There is an almost continual thirst, which in the progress of the disease becomes very urgent; the urine is thick, in small quantity, and red. The pulse is small and frequent; and as the belly swells, the other parts waste away. A fever at last arises, which, constantly increasing, at last carries off the patient. These symptoms are most urgent where the waters are in immediate contact with the intestines; in the other kinds the rest of the body is less wasted; nor is there so great thirst or difficulty of breathing.

*Cause, &c.* The immediate cause of dropsy is a greater effusion of serum by the exhalant arteries than the absorbents can take up. This may be occasioned either by too great a quantity of liquid thrown out by the former, or by an inability of the latter to perform their office. This commonly happens in people whose bodies are of a weak and lax texture, and hence women are more subject to this malady than men; chlorotic

PRACTICE chlorotic girls especially are very apt to become dropsical.

Sometimes, however, this disease is occasioned by a debility of the vital powers, by great evacuations of blood, or by acute diseases accidentally protracted beyond their usual period; and although this cause seems very different from a laxity of fibres, yet the dropsy seems to be produced in a similar manner by both. For the vital powers being debilitated by either of these causes, naturally bring on a certain debility and laxity of the solids; and on the other hand a debility of the solids always brings on a debility of the vital powers; and from this debility of the vital powers in both cases it happens, that those humours which ought to be expelled from the body are not, but accumulate by degrees in its cavities. There is, however, this difference between the two kinds of dropsy arising from these two different causes, That in the one which arises from laxity, the solid parts are more injured than in that which arises from a debility of the vital powers. In the former, therefore, the water seems to flow out from every quarter, and the body swells all over. But when the disease is occasioned by a debility of the vital powers, though the solids are less damaged, yet the power of the heart being much diminished, and the humours scarce propelled through the extreme vessels, the thin liquids by which, in a healthy state the body is daily recruited, are carried by their own weight either into the cavities or into the cellular texture. Hence those aqueous effusions which follow great evacuations of blood, or violent loosenesses, begin in the more depending parts of the body, gradually ascending, till they arrive at the cavity of the abdomen, or even the thorax.

But another and much more sufficient cause for the production of dropsy is an obstruction of the circulation; and this may take place from polypi in the heart or large vessels, and hard swellings in the abdomen. Instances have been observed of a dropsy arising from steatomatous tumours in the omentum, and many more from a scirrhus liver or spleen, and from an infarction and obstruction of the mesenteric glands, by which means the lymph coming from the extremities is prevented from arriving at the heart.

Lastly, whatever, either within or without the vessels, contracts or shuts up their cavities, produces a more copious and easy transmissibility of the thin humours through the exhalant arteries, at the same time that it prevents their return by the absorbent veins. This hath been established by experiment. For Lower having perforated the right side of the thorax in a dog, tied the *vena cava*, and sewed up the wound. The animal languished for a few hours, and then died. On dissection, a great quantity of serum was found in the abdomen, as if he had long laboured under an ascites. In like manner, having tied the jugular veins of another dog, a surprising swelling took place in those parts above the ligatures, and in two days the creature died. On dissection, all the muscles and glands were vastly distended, and quite pellucid, with limpid serum. From these experiments, and some cases of disease mentioned by different authors, it appears, that when the veins are obstructed so that they cannot receive the arterial blood, the serum is separated as by a filtre into the more open cavities and laxer parts of the body,

while the thicker part stagnates and is collected in the proper blood-vessels.

The too great tenuity of the humours is very frequently accused as the cause of dropsy, and many authors have asserted that dropsy might arise merely from a superabundance of water in the blood. For this some experiments of Halesius are quoted, from which they would infer, that when a great quantity of aqueous fluid is introduced into the blood, the superfluous fluid ought by no means to pass thro' the extremities of the sanguiferous arteries into the veins in the common course of circulation, but by being effused into the cavities should produce a dropsy. But this can only happen when the vital powers are very much diminished; for, in a natural state, the superfluous quantity is immediately thrown out by the skin or the kidneys: and agreeable to this we have an experiment of Schultzeius, who induced a dropsy in a dog by causing him drink a great quantity of water; but he had first bled him almost *ad deliquium*, so that the vital powers were in a manner oppressed by the deluge of water. In this manner do those become hydropic, who are seized with the disease on drinking large quantities of water either when wearied with labour, or weakened by some kinds of diseases. Dr Fothergill relates an instance of a person who, being advised to drink plentifully of barley-water, in order to remove a fever, rashly drunk 12 pounds of that liquor every day for a month, and thus fell into an almost incurable distemper. But if this quantity had been taken only during the prevalence of the fever, he would in all probability have suffered no inconvenience, as is probable from what we have formerly related concerning the *diata aqua* used by the Italians.

It is moreover evident from experiments, that, in a healthy state, not only water is not deposited in the cavities, but that if it is injected into them it will be absorbed, unless some laxity of the solids hath already taken place. Dr Musgrave injected into the right side of the thorax of a dog, four ounces of warm water; whence a difficulty of breathing and weakness immediately followed. But these symptoms continually lessened, and in the space of a week the animal seemed to be in as good health as before. Afterwards he injected 16 ounces of warm water into the left cavity of the thorax in the same dog; the same effects followed, together with great heat, and strong pulsation of the heart; but he again recovered in the space of a week. Lastly, he injected 18 ounces of water into one side of the thorax, and only six into the other: the same symptoms followed, but vanished in a much shorter time; for within five days the dog was restored to perfect health. During this time, however, he observed that the creature made a greater quantity of urine than usual.

The remote causes of dropsy are many and various. Whatever relaxes the solids in such a manner as to give an occasion of accumulation to the ferous fluids, disposes to the dropsy. A lazy indolent life, rainy wet weather, swampy or low soil, and every thing which conduces to vitiate the viscera, or insensibly to produce obstructions in them, paves the way for a dropsy. Hence those are ready to fall into the disease who use hard and viscid aliments, such as poor people in some countries who use coarse brown bread, and children

who



who are fed with unwholesome aliments; and the same thing happens to those who drink immoderately of spirituous liquors.

*Prognosis.* When the dropsy arises from a scirrhus of the liver or spleen, or any of the other viscera, the prognosis must always be fatal, as also when it arises from disorders of the lungs. Neither is the case more favourable to those in whom the small vessels are ruptured, and pour out their liquids into the cavity of the abdomen. Those certainly die who have polypi in the vessels, or tumours compressing the veins and vessels of the abdomen. A dropsy arising from obstructions in the mesenteric glands is likewise difficult to cure, whether such obstructions arise from a bad habit of body, or from any other cause; but if we can by any means remove the disease of the glands, the dropsy easily ceases. But in those who fall into dropsy without any disease preceding, it is not quite so dangerous; and even though a disease hath preceded, if the patient's strength is not greatly weakened, if the respiration is free, and the person is not affected with any particular pain, we may entertain great hopes of a cure. But where a great loss of blood is followed by a fever, and that by a dropsy, the patients almost always die, and that in a short time; but they are very frequently cured who fall into this disease without any preceding hæmorrhage.

*Cure.* In the cure of this disease authors chiefly mention two indications. 1. To expel the superfluous quantity of water; and, 2. To prevent its being again collected. But before we proceed to speak of the remedies, it is necessary to take notice, that by the animal economy, if a great evacuation of a fluid takes place in any part of the body, all the other fluids in the body are directed towards that part, and those which lie as it were lurking in different parts will be immediately absorbed, and thrown out by the same passage. Hence the humours which in hydropic persons are extravasated into the different cavities of the body will be thrown into the intestines, and evacuated by purgatives; or by diuretics will be thrown upon the kidneys, and evacuated by urine. It is not, however, only necessary to excite these evacuations in order to remove this malady, but they must be assiduously promoted and kept up till the abundant humour is totally expelled. For this reason Sydenham has advised purgatives to be administered every day, unless, either through the too great weakness of the body, or the violent operation of the purgative, it shall be necessary to interpose a day or two now and then; because if any considerable intervals are allowed to take place between the exhibition of the purgatives, an opportunity is given to the waters of collecting again. In this method, however, there is the following inconvenience, that, when the waters are totally evacuated, the strength is at the same time so much exhausted, that the distemper commonly returns in a very short time. Hence almost our only hopes of curing a dropsy, consist in gently evacuating the waters by means of diuretics. But the efficacy of these is generally very doubtful. Dr Freind hath long ago observed, that this part of medicine is of all others the most lame and imperfect; but a certain French physician named *Bacher*, lately found a method of making the diuretics much more

successful. His reputation became at last so great, that the French king thought proper to purchase his secret for a great sum of money. The basis of his medicine was hellebore-root, the malignant qualities of which he pretended to correct in the following manner. A quantity of the dried roots of black hellebore were pounded, and then put into a glazed earthen vessel, and afterwards sprinkled "*spiritu vini armato alkali*." They were suffered to stand for twelve hours, stirring them about twice or thrice during that space of time. They were then sprinkled again, and at last good Rhenish wine was poured on till it stood six fingers above the roots. The mixture was frequently agitated with a wooden spatula; and as the wine was imbibed by the roots, more was poured on, so as to keep it always at the same height for 48 hours. The whole was then put on the fire and boiled for half an hour, after which the decoction was violently pressed out; the same quantity of wine was added as at first, and the mixture boiled as before. After the second expression the woody residuum was thrown away as useless. Both the strained liquors are then mixed together with two parts of boiling water to one of the decoction. The whole is then evaporated in a silver vessel to the consistence of a syrup. One part of the extract is again added with two parts of boiling water, and the whole inspissated as before.—By this means, says he, the volatile nauseous acrid particles are separated by evaporation, and the fixed ones remain corrected and prepared for medicinal uses; adding, towards the end, a ninth part of old brandy, and evaporating to the consistence of turpentine. Our author reasons a good deal on the way in which this process corrects the medicine; but tells us, that notwithstanding the improvement, his pills will not have the desired effect unless properly made up. For forming them, they ought to be mixed with matters both of an inviscating and indurating nature; yet so prepared that it will be readily soluble in the stomach, even of a person already debilitated. For answering these purposes, he chose myrrh and carduus benedictus, and then gives the following receipt for the formation of his pills.

"Take of the extract of hellebore prepared as above directed, and of solution of myrrh, each one ounce; of powdered carduus benedictus, three drachms and a scruple. Mix them together, and form into a mass, dividing it into pills of a grain and an half each."

The effects of these pills were very surprising. Dr Daignan relates, that he gave them to 18 hydropic patients at once; and these he divided into three classes, according to the degree of the disease with which they were affected. The first class contained those who laboured under an anasarca following intermittent fevers. The second class contained those who had an anasarca, together with some degree of ascites, arising from tedious febrile disorders. All these were cured; but these two classes consisted of such cases as are most easily removed. But the third contained six who were seized with a most violent anasarca and ascites, after being much weakened by tedious disorders, and of consequence in whom the disease was very difficult to be cured. Even of these, however, four were cured, and the other two died. The body of one of these being dissected, both sides of the cavity of

practise of the thorax were found to be full of a blackish-red water. The lungs were unfound; there was a poly-pous concretion in the right ventricle of the heart; the liver and spleen were hard, and of a preternatural bulk; and the glands of the mesentery were obstructed, and infarcted. In the other, the liver and pancreas were scirrhus, and the spleen very hard.

The same medicines were given by Dehorne to eight persons, six of whom had both an anasarca and ascites, but the other two only an ascites. Four of these recovered; three died without being freed from the dropsy; one in whom the dropsy was cured, died in a short time after, having for some time before his death become speechless.

By these patients 10 of the pills were taken at once; and the same dose repeated thrice, with an interval of an hour betwixt each dose. At first they proved purgative, and then diuretic; by which last evacuation they finally cured the disease. But though Becher was firmly of opinion that his pills cured the dropsy by reason of the above-related correction; yet it is certain, that, in the hands of other practitioners, these very pills have failed, unless they also made use of the same regimen recommended by that physician; while, on the other hand, it is certain that different medicines will prove equally efficacious in dropical cases, provided this regimen is made use of.

For a great number of ages it hath been recommended to dropical patients to abstain as much as possible from drink, and thus to the torments of their disease was added that of an intolerable thirst; and how great this torment was, we may understand from an example of a friend of king Antigonous, who, having been closely watched both by order of the physicians and also of the king, was so unable to bear the raging thirst occasioned by his disease, that he swallowed his own excrements and urine, and thus speedily put an end to his life. Dr Milman shews at great length the pernicious tendency of this practice. He maintains that it is quite contrary to the sentiments of Hippocrates and the best ancient physicians. He asserts, that unless plenty of diluting drink is given, the best diuretics can have no effect. He condemns also in the strongest terms the practice of giving dropical patients only dry, hard, and indigestible aliments. These would oppress the stomach even of the most healthy, and how much more must they do so to those who are already debilitated by labouring under a tedious disorder? By what means also are these aliments to be dissolved in the stomach, when drink it withhold? In this disease the saliva is viscid, and in small quantity; from whence it may be reasonably conjectured, that the rest of the fluids are of the same nature, and the gastric juices likewise depraved. Thus the aliments lie long in the stomach; and if the viscera were formerly free of obstructions, they are now generated; the strength fails; perspiration and other excretions are obstructed; the viscid and pituitous humours produced by these kinds of food float about the præcordia, and increase the disease, while the surface of the body becomes quite dry. Nay, so much does this kind of diet conspire with the disease, that 1000 pounds of fluid will sometimes be imbibed in a few days by hydropic persons who take no drink. Even in health, if the body from any cause becomes dry, or deprived of a considerable part of its

juices, as by hunger, labour, &c. it will imbibe a considerable quantity of moisture from the air; so that we must impute the abovementioned extraordinary inhalation, in part at least, to the denial of drink, and to the nature of the aliment given to the sick. The following is the method, related by Dr Milman, of his practice in the Middlesex hospital.

If the patient is not very much debilitated, he is sometimes treated with the purging waters, and a dose of jalap and calomel alternately. On the intermediate days he gets a saline mixture, with 40 or 60 drops of *acetum scilliticum* every sixth hour; drinking with the purgatives oat-gruel and some thin broths. That he might the better ascertain what share the liquids given along with the medicines had in producing a copious flow of urine, he sometimes gave the medicines in the beginning of the distemper without allowing the drink: but though the swellings were usually diminished a little by the purgatives, the urine still continued scanty, and the patients were greatly weakened. Fearing, therefore, lest, by following this course, the strength of the sick might be too much reduced, he then began his course of diuretic medicines, giving large quantities of barley-water with a little *sal diureticus*; by which means, sometimes in the short space of 48 hours after the course was begun, the urine flowed out in very large quantity: but as saline drinks are very disagreeable to the taste, a drink was composed purposely for hydropic persons, of half an ounce of cream of tartar dissolved in two pounds of barley-water, made agreeably sweet with syrup, adding one or two ounces of French brandy.

To this composition Dr Milman was induced by the great praises given to cream of Tartar by some physicians in hydropic cases. In the *Acta Bononiensis*, 15 cases of hydropic patients are narrated who were cured only by taking half an ounce of cream of Tartar daily. But it is remarkable, that by these very patients the cream of Tartar was taken for 20, 30, nay 40 days, often without any perceptible effect; yet when dissolved in a large quantity of water, it shewed its salutary effects frequently within as many hours, by producing a plentiful flow of urine. This liquor is now the common drink of hydropic patients in the hospital abovementioned, of which they drink at pleasure along with their medicines.

Among purgative medicines Dr Milman recommends the *radix senecæ*; but says, the decoction of it according to the Edinburgh Dispensatory is too strong, as he always found it excite vomiting when prepared as there directed, and thus greatly to distress the patients: but when only half an ounce or six drachms of the root are used to a pound of decoction, instead of a whole ounce as directed by the Edinburgh college, he finds it an excellent remedy; and though it may sometimes induce a little vomiting, and frequently a nausea, yet it seldom failed to procure nine or ten stools a-day, and sometimes also proved diuretic. But we must take care not to be too free in the use of seneca, or any other purgative, if the patients are very weak; and therefore, after having used purgatives for some time, it will be proper to depend upon diuretics entirely for perfecting the cure; and of the success of this method our author gives some very remarkable instances. But he observes, that after the dropsy is removed,

moved, the patients will sometimes die without any evident cause; and of this it is proper that the physician should be aware. It is remarkable with what ease a flux of urine is induced in those who have a scirrhus liver; while on the other hand, in one who had the mesenteric glands obstructed, along with a scirrhus of the liver and vitiated state of the lungs, the most powerful diuretics proved ineffectual. In some cases our author thinks the kidneys may be so pressed with the weight of the water, as to be unable to perform their office.

The water having been drawn off, we are to put the patient on a course of strengtheners; such as the cortex and filings of iron, with some of the warm aromatics, and a due proportion of rhubarb infused in wine. Enjoin brisk exercise and frictions on the belly, with such a course of diet as shall be light and nourishing.

When the patient can by no other means be relieved, the operation of paracentesis must be had recourse to. See the article SURGERY.

#### CLXVII. HYDROMETRA, or DROPSY of the Uterus. Genus LXXX.

442

Hydrometra, *Sauv. gen. 289. Sag. 116. Boerb. 1224.*

#### CLXVIII. HYDROCELE, or DROPSY of the Scrotum. Gen. LXXXI.

443

Oscheocele, *Sauv. gen. 41. Vog. 388.*

Oscheophyma, *Sag. 44.*

Hydros scroti, *Vog. 389.*

Hydros testium, *Boerb. 1227.*

For the treatment of these two diseases, see ASCITES above, and SURGERY.

#### CLXIX. PHYSCONIA, or SWELLING of the Belly. Genus LXXXII.

444

Phyconia, *Sauv. gen. 283. Vog. 325. Sag. gen. 110.*

Hypofarca, *Lin. 218.*

This may arise from a variety of causes, as from a swelling of the liver, spleen, kidneys, uterus, omentum, ovarium, mesentery, intestines, &c. and sometimes it arises merely from fat. In the former cases, as the viscera are generally scirrhus and indurated, the dilemma is for the most part incurable; neither is the prospect much better where the disease is occasioned by a great quantity of fat.

#### CLXX. RACHITIS, the RICKETS. Genus LXXXIII.

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Rachitis, *Sauv. gen. 294. Lin. 212. Vog. 312. Sag. gen. 120. Boerb. 1480. Hoffm. III. 487. Zeviani della Rachitide. Glisson de Rachitide.*

*Description.* This is one of the diseases peculiar to infancy. It seldom attacks children till they are nine months, nor after they are two years old; but it frequently happens in the intermediate space between these two periods. The disease shews itself by a flaccid tumour of the head and face, a loose flabby skin, a swelling of the abdomen, and falling away of the outer parts, especially of the muscles. There is a protuberance of the epiphyses of the joints; the ju-

gular veins swell, while the rest decrease; and the legs grow crooked. If the child has begun to walk before he is seized with this disease, there is a slowness, debility, and tottering in his motion, which soon brings on a constant desire of sitting, and afterwards of lying down; inasmuch that nothing at last is moveable but the neck and head. As they grow older, the head is greatly enlarged, with ample turgor; the thorax is compressed on the sides, and the sternum rises up sharp, while the extremities of the ribs are knotty. The abdomen is protuberant, and the teeth black and carious. In such patients as have died of this disease, all the solids appeared soft and flaccid, and the fluids dissolved and mucous.

*Causes.* The rickets may proceed from serophulous or venereal taints in the parents, and may be increased by those of the nurse. It is likewise promoted by feeding the child with aqueous and mucous substances, crude summer-fruits, fish, uncleaned farinaceous aliment, and too great a quantity of sweet things.— Sometimes it follows intermittent fevers, and chronic disorders; and in short, is caused by any thing which tends to debilitate the body, and induce a viscid and unhealthy state of the juices.

*Prognosis.* The rickets do not usually prove mortal; but, if not cured in time, they make the person throughout life deformed in various ways; and often produce very pernicious disorders, such as carious bones in different parts of the body.

*Cure.* This is to be effected by mild cathartics, alteratives, and tonics, such as are used in other diseases attended with a debility of the system and a vitiated state of the blood and juices. In the Western Islands of Scotland, the medicine used for the cure of the rickets is an oil extracted from the liver of the skate-fish. The method of application is as follows. First, the wrists and ankles are rubbed with the oil in the evening: this immediately raises a fever of several hours duration. When the fever from the first rubbing subsides, the same parts are rubbed again the night following; and repeatedly, as long as the rubbing of these parts continues to excite the fever.— When no fever can be excited by rubbing the wrists and ankles alone, they are rubbed again along with the knees and elbows. This increased unction brings on the fever again; and is practised as before, till it no longer has that effect. Then the vertebrae and sides are rubbed, along with the former parts; and this unction, which again brings on the fever, is repeated as the former. When no fever can be longer excited by this unction, a flannel-shirt dipped in the oil is put upon the body of the patient: this brings on a more violent and sensible fever than any of the former unctions; and is continued till the cure is completed, which it commonly is in a short time.

A German physician, named Dr Strack, hath lately published a paper, in which he recommends the filings of iron as a certain remedy in the rickets. This disease, he observes, in general begins with children when they are about 16 months old. It is seldom observed with children before they be one year old, and seldom attacks them after they pass two; and it is very generally worse where it begins early than where it begins late.



For effecting a cure, it is, he affirms, a matter of the utmost consequence to be able to distinguish, very early, whether a child will be afflicted with rickets or not. And this, he assures us, may be determined by the following symptoms: Paleness and swelling of the countenance; and in that part of the cheeks which should naturally be red, a yellow colour, approaching to that of sulphur. When that is the case, he directs that a medicine should be immediately had recourse to which will retard the further progress of the disease and remove what has already taken place. For this purpose, he advises that five grains of the filings of iron, and as much rhubarb, should be rubbed up with ten grains of sugar, and given for a dose every morning fasting, and every evening an hour before supper. But if considerable looseness should be produced, it will be necessary, at first, to persist in the use of one dose only every day.

After a month's continuance in this course, according to our author, there in general ensues a keen appetite for food, quick digestion, and a copious flow of urine; by means of which, the fulness of the face and yellowness of the complexion are by degrees removed, while the natural colour of the countenance and firmness of the body in general are gradually restored. This practice, he assures us, has never failed of success in any one instance; not even in those children born of parents greatly afflicted with the rickets.

When the bones of rickety children begin to bend, they may sometimes be restored to their natural shape by compresses, bolsters, and proper supports. See the article SURGERY.

### ORDER III. IMPETIGINES.

Impetigines, *Sauv.* Cl. X. Ord. V. *Sag.* Cl. III. Ord. V.

#### CLXXI. SCROPHULA, or KING'S-EVIL.

Genus LXXXIV.

Scrophula, *Sauv.* gen. 285. *Vog.* 367. *Sag.* 121. *Struma*, *Lin.* 284.

*Description.* This disease shews itself by hard, scirrhous, and often indolent tumours, which arise by degrees in the glands of the neck, under the chin, arm-pits, and different parts of the body; but most commonly in the neck, and behind the ears. In process of time, the cellular substance, ligaments of the joints, and even the bones themselves, are affected. In scrophula the swellings are much more moveable than those of the scirrhous kind; they are generally softer, and seldom attended with much pain: they are tedious in coming to suppuration; are very apt to disappear suddenly, and again to rise in some other part of the body. We may likewise mention as characteristic circumstances of this disease, a remarkable softness of the skin, a kind of fulness of the face, generally with large eyes, and a very delicate complexion.

*Causes.* A variety of causes have been mentioned as tending to produce scrophula, viz. a crude indigestible food; bad water; living in damp, low situations; its being an hereditary disease, and in some countries endemic, &c. But whatever may in different circumstances be the exciting or predisposing

causes of the scrophula, the disease itself either depends upon, or is at least much connected with, a debility of the constitution in general, and probably of the lymphatic system in particular, the complaint always showing itself by some affections of the latter. And that debility has at least a considerable influence on its production is probable, not only from the manifest nature of some of the causes said to be productive of scrophula, but likewise from such remedies as are found most serviceable in the cure, which are all of a tonic invigorating nature.

*Prognosis.* The scrophula is a distemper which often eludes the most powerful medicines, and therefore physicians cannot with any certainty promise a cure. It is seldom, however, that it proves mortal in a short time, unless it attacks the internal parts, such as the lungs, where it frequently produces tubercles that bring on a fatal consumption. When it attacks the joints, it frequently produces ulcers, which continue for a long time, and gradually waste the patient; while in the mean time the bones become foul and corroded, and death ensues after a long scene of misery. The prognosis in this respect must be regulated entirely by the nature of the symptoms.

*Cure.* It was long supposed, that scrophula depended upon an acid acrimony of the fluids; and this, it is probable, gave rise to the use of burnt sponge, different kinds of soap, and other alkaline substances, as the best remedies for acidity. But although a sourness of the stomach and *prime viæ* does no doubt frequently occur in these complaints, yet it seems to be entirely the consequence of that general relaxation which in scrophula so universally prevails, and which does not render it in the least necessary to suppose a general acicency of the fluids to take place; as the one very frequently, it is well known, even in other complaints, occurs without the least suspicion of any acid acrimony existing. This is also rendered very probable from the indolent nature of scrophulous tumours, which have been known to subsist for years without giving any uneasiness; which could not have been the case, if an acid, or any other acrimony, had prevailed in them.

Gentle mercurials are sometimes of use as resolvents in scrophulous swellings; but nothing has such considerable influence as a frequent and copious use of Peruvian bark. Cold bathing too, especially in the sea, together with frequent moderate exercise, is often of singular service here; as is likewise change of air, especially to a warm climate.

In the scrophulous inflammation of the eyes, or ophthalmia strumosa, the bark has also been given with extraordinary advantage; and we meet with an instance of its having cured the gutta serena in the face; a complaint which it is often difficult to remove, and is extremely disagreeable to the fair sex.

From the various cases related of tumefied glands it appears, that when the habit is relaxed and the circulation weak, either from constitution or accident, the bark is a most efficacious medicine, and that it acts as a resolvent and discutient. It will not, however, succeed in all cases; but there are few in which a trial can be attended with much detriment. Dr Fothergill observes, that he has never known it avail much where the bones are affected, nor where the scrophulous tumour

**PRACTICE** is so situated as to be accompanied with much pain, as in the joints, or under the membranous coverings of the muscles; for when the disease attacks those parts, the periosteum seldom escapes without some injury, by which the bone will of course be likewise affected. Here the bark is of no effect; instead of lessening, it rather increases the fever that accompanies those circumstances; and, if it does not really aggravate the complaint, it seems at least to accelerate the progress of the disease.

Various are the modes in which the bark is administered; but Dr Fothergill makes use of a decoction, with the addition of some aromatic ingredients and a small quantity of liquorice-root, as a form in which a sufficient quantity may be given without exciting disgust.

The powder soon becomes disagreeable to very young patients; and the extract seems not so much to be depended upon as may have been imagined. In making the extract, it is exposed to so much heat, as must have some effect upon its virtues, perhaps to their detriment. In administering it, likewise, if great care be not taken to mix it intimately with a proper vehicle, or some very soluble substance, in weak bowels it very often purges, and thereby not only disappoints the physician, but injures the patient. A small quantity of the *cortex Winteranus* added gives the medicine a grateful warmth; and a little liquorice, a few raisins, gum arabic, or the like, added to the decoction before it is taken from the fire, by making the liquor viscid enables it to suspend more of the fine particles of the bark; by which process the medicine is not only improved in efficacy, but at the same time rendered less disagreeable.

In indolent swellings of the glands from viscid humours, sea-water also has been strongly recommended by Dr Ruffel.

Dr Fothergill also acquaints us, that the cicuta is not without a considerable share of efficacy in removing scrophulous disorders. He mentions the case of a gentlewoman, about 28 years of age, afflicted from her infancy with scrophulous complaints, severe ophthalmies, glandular swellings, &c. cured by the *extrattum cicute* taken constantly for the space of a year. He observes, however, that when given to children even in very small doses, it is apt to produce spasmodic affections; for which reason he rarely exhibits it to them when very young, or even to adults of very irritable habits.

Our author gives several other instances of the success of cicuta in scrophulous cases, and even in one which seemed to be not far removed from a confirmed phthisis, but owns that it seldom had such good effects afterwards; yet he is of opinion, that where there are symptoms of tubercles forming, a stumous habit, and a tendency to phthisis, the cicuta will often be serviceable. It is anodyne, corrects acrimony, and promotes the formation of good matter. With regard to the quality of the medicine, our author observes, that the extract prepared from hemlock before the plant arrives at maturity, is much inferior to that which is made when the hemlock has acquired its full vigour and is rather on the verge of decline: just when the flowers fade, the rudiments of the seeds become observable, and the habit of the plant inclines to yellow,

seems the proper time to collect the hemlock. It has **PRACTICE** then had the full benefit of the summer-heat, and the plants that grow in exposed places will generally be found more virous than those that grow in the shade. The less heat it undergoes during the preparation, the better. Therefore, if a considerable quantity of the dry powder of the plant, gathered at a proper season, is added, the less boiling will be necessary, and the medicine will be the more efficacious. But let the extract be prepared in what manner soever it may, provided it is made from the genuine plant, at a proper season, and is not destroyed by boiling, the chief difference observable in using it, is that a larger quantity of one kind is required to produce a certain effect than of another. Twenty grains of one sort of extract have been found equal in point of efficacy to thirty, nay near forty of another; yet both of them made from the genuine plant, and most probably prepared with equal fidelity. To prevent the inconveniencies arising from this uncertainty, it seems always expedient to begin with small doses, and proceed, step by step, till the extract produces certain effects, which seldom fail to arise from a full dose. These effects are different in different constitutions. But, for the most part, a giddiness affecting the head, and motions of the eyes as if something pushed them outwards, are first felt; a slight sickness, and trembling agitation of the body; a laxative stool or two. One or all these symptoms are the marks of a full dose, let the quantity in weight be what it will. Here we must stop till none of these effects are felt; and in three or four days, advance a few grains more. For the general experience of all who have used this medicine to any good purpose agree, that the cicuta seldom procures any benefit, though given for a long time, unless in as large a dose as the patient can bear without suffering any of the inconveniencies abovementioned.

Patients commonly bear a greater quantity of the extract at night than at noon, and at noon than in the morning. Two ounces may be divided into thirty pills, not gilt. Adults begin with two in the morning, two at noon, and three or four at night, with directions to increase each dose, by the addition of a pill to each, as they can bear it.

# CLXXII. SYPHILIS, the LUES VENEREA, or 447 French Pox. GENUS LXXV.

Syphilis, *Sauv.* gen. 3086. *Lin.* 6. *Vog.* 319. *Sag.* 126.

Lues venerea, *Boerh.* 1440. *Hoffm.* III. 413. *Junc.* 96. *Astruc* de lue venerea.

**ASTRUC**, who writes the history of the lues venerea, is fully convinced that it is a new disease, which never appeared in Europe till some time between the years 1494 and 1496, having been imported from America by the companions of Christopher Columbus; though this opinion is not without its opponents.

The venereal infection, however, cannot, like the contagious miasmata of the small-pox and some other diseases, be carried through the air, and thus spread from place to place: for unless it is transmitted from the parents to the children, there is no other way of contracting the disease but by actually touching  
some

PRACTICE some person who is affected. Thus, when a nurse happens to labour under the disease, the infant that she suckles will receive the infection; as, on the other hand, when the child is infected, the nurse is liable to receive it: and there have even been instances known of lying in women being infected very violently, from having employed a person to draw their breasts who happened to have venereal ulcers in the throat. It may be caught by touching venereal sores if the cuticle be abraded or torn, and in this way accoucheurs and midwives have sometimes been infected severely. Dr Macbride says, the most inveterate pox he ever saw, was caught by a midwife, who happened to have a whitelow on one of her fingers, when she delivered a woman ill of the lues venerea.

But by far the most ready way of contracting this disease is by coition, the genital parts being much more bibulous than the rest of the body. When the disorder is communicated, the places where the morbid matter enters are generally those where it first makes its appearance; and as coition is the most usual way of contracting it, so the first symptoms usually appear on or near the pudenda.

The patient's own account will, for the most part, help us to distinguish the disease: but there are sometimes cases wherein we cannot avail ourselves of this information, and where, instead of confessing, the parties shall conceal all circumstances; while, on the other hand, there are now and then people to be met with, who persuade themselves, that symptoms are venereal, which in reality are owing to some other cause: and therefore it is of the utmost importance to inform ourselves thoroughly of the nature of those symptoms and appearances which may be considered as pathognomic signs of lues venerea.

In the first place, when we find that the local symptoms, such as chancres, buboes, phymosis, and the like, do not give way to the usual methods; or when these complaints, after having been cured, break out again without a fresh infection; we may justly suspect that the virus has entered the whole mass of lymph: but if at the same time ulcers break out in the throat, and the face is deformed by callous tubercles covered with a brown or yellow scab, we may be assured that the case is now become a confirmed lues, which will require a mercurial course.

When eruptions of the scorbutous and superficial kind are venereal, they are not attended with itching; and the scale being picked off, the skin appears of a reddish brown, or rather copper-colour, underneath; whereas leprous eruptions are itchy, throw off a greater quantity of scales, and rise in greater blotches, especially about the joints of the knees and elbows. Venereal tubercles or pustules are easily distinguished from carbuncles of the face, by not occupying the cheeks or the nose, nor as having a purulent apex, but are covered at top, either with a dry branny scurf like the superficial eruptions just now mentioned, or else with a hard dry scab of a tawny yellow hue; they particularly break out among the hair, or near to it, on the forehead, or on the temples.

Venereal ulcers affecting the mouth are distinguishable from those which are scorbutic, in the following manner: 1. Venereal ulcers first affect the tonsils, fau-

ces, and uvula; then the gums, but these very rarely: on the contrary, scorbutic ulcers affect the gums first of all; then the fauces, tonsils, and uvula. 2. Venereal ulcers frequently spread to the nose; scorbutic ones never. 3. Venereal ulcers are callous in the edges; scorbutic ones are not so. 4. Venereal ulcers are circumscribed, and, for the most part, are circular, at least they are confined to certain places; scorbutic ones are of a more irregular form, spread wider, and frequently affect the whole mouth. 5. Venereal ulcers are for the most part hollow, and generally covered at bottom with a white or yellow slough; but scorbutic ones are more apt to grow up into loose fungi. 6. Venereal ulcers are red in their circumference, but scorbutic ones are always livid. 7. Venereal ulcers frequently rot the subjacent bones, the scorbutic ones seldom or ever. 8. And lastly, Venereal ulcers are most combined with other symptoms which are known to be venereal; scorbutic ones with the distinguishing signs of the scurvy, such as strait breathing, lowness, swelling of the legs, rotten gums, &c.

Another sure sign of the confirmed lues, are certain deep-seated nocturnal pains, particularly of the shins, arms, and head. As for any superficial wandering pains, that have no fixed seat, and which affect the membranes of the muscles and ligaments of the joints, they, for the most part, will be found to belong to the gout or rheumatism, and can never be considered as venereal unless accompanied with some other evident signs; but with regard to the pains that are deeply seated, and always fixed to the same place, and which affect the middle and more solid part of the ulna, tibia, and bones of the cranium, and rage chiefly and with greatest violence in the fore-part of the night, so that the patient can get no rest till morning approaches, these may serve to convince us that the disease has spread itself throughout the whole habit, whether they be accompanied with other symptoms of the lues or not. *Gummata* in the fleshy parts, *nodes* in the periosteum, *ganglia* upon the tendons, *tophi* upon the ligaments, *exostoses* upon the bones, and *sicci* at the verge of the anus, are all of them signs of the confirmed lues: these are hard indolent swellings; but as they sometimes arise independent of any venereal infection, and perhaps may proceed from a scrophulous taint, unless they are accompanied, or have been preceded, by some of the more certain and evident symptoms of the lues, we must be cautious about pronouncing them venereal. When these swellings are not owing to the syphilitic virus, they are very seldom painful, or tend to inflame and suppurate; whereas those that are venereal usually do, and if they lie upon a bone generally bring on a caries.

These carious ulcers are most commonly met with upon the ulna, tibia, and bones of the cranium; and when accompanied with nocturnal pains, we can never hesitate about declaring their genuine nature. Frequent abortions, or the exclusion of scabby, ulcerated, half-rotten, and dead fetuses, happening without any manifest cause to disturb the fetus before its time, or to destroy it in the womb, may be reckoned as a sure sign that at least one of the parents is infected.

These then are the principal and most evident signs of the confirmed lues. There are others which are more equivocal, and which, unless we can fairly trace them back



back to some that are more certain, cannot be held as signs of the venereal disease: Such are, 1. Obsolete inflammations of the eyes, frequently returning with great heat, itching, and ulceration of the eye-lids. 2. A ringing and hissing noise in the ears, with ulcers or caries in the bones of the meatus auditorius. 3. Obsolete head-achs. 4. Obsolete cutaneous eruptions, of the itchy or leprous appearance, not yielding to the milder methods of treatment. 5. Swellings of the bones; and, 6. Wandering and obsolete pains. None of these symptoms however can be known to be venereal, except they happen to coincide with some one or other of the more certain signs.

Upon the whole, we are first to distinguish and consider the several symptoms apart; and then, by comparing them with each other, a clear judgment may be formed upon the general review.

*Prognosis.* Being thoroughly convinced that the case is venereal, we are to consider, first of all, whether it be of a longer or shorter date; for the more recent it is, it will, *ceteris paribus*, be less difficult to remove. But there are other circumstances which will assist us in forming a prognostic as to the event. As,

1. The age of the patient. This disorder is more dangerous to infants and old people, than to such as are in the flower and vigour of life, in whom some part of the virus may be expelled by exercise, or may be subdued in some degree by the strength of the constitution.

2. The sex. Though women are for the most part weaker than men, and therefore should seem less able to resist the force of any disease, yet experience shews that this is easier borne by them than by men; which seems owing to the menstrual and other uterine discharges, by which perhaps a good share of the virus may be carried off immediately from the parts where it was first applied; for it is observable, that whenever these discharges are obstructed, or cease by the ordinary course of nature, all the symptoms of this disease grow worse.

3. The habit of body. Persons who have acrid juices will be liable to suffer more from the venereal poison than such as have their blood in a milder state; hence, when people of a scorbutic or scrophulous habit contract venereal disorders, the symptoms are always remarkably violent, and difficult to cure. And for the same reasons, the confirmed lues is much more to be dreaded in a person already inclined to an asthma, phthisis, dropsy, gout, or any other chronic distemper, than in one of a sound and healthy constitution. For, as the original disease is increased by the accession of the venereal poison, so the lues is aggravated by being joined to an old disorder. The more numerous the symptoms, and the more they affect the bones, the more difficult the cure; but if the acrimony should seize on the nobler internal parts, such as the brain, the lungs, or the liver, then the disease becomes incurable, and the patient will either go off suddenly in an apoplectic fit, or sink under a consumption.

*Cure.* Some practitioners have affirmed, that the disease may be totally extirpated without the use of mercury: but, excepting in slight cases, it appears from the most accurate observations, that this grand specific is indispensable; whether it be introduced through the pores of the skin, in the form of ointments, pla-

sters, washes, &c.; or given by the mouth, disguised in the different shapes of pills, troches, powders, or solutions.

Formerly it was held as a rule, that a salivation ought to be raised, and a great discharge excited. But this is now found to be unnecessary: for, as mercury acts by some specific power in subduing and correcting the venereal virus, all that is required is to throw in a sufficient quantity of the medicine for this purpose; and if it can be diverted from the salivary glands, so much the better, since the inconveniences attending a spitting are such as we should always wish to avoid.

Mercury, when combined with any saline substance, has its activity prodigiously increased; hence the great variety of chemical preparations, which have been contrived to unite it with different acids.

Corrosive sublimate is one of the most active of all the mercurial preparations, inasmuch as to become a poison even in very small doses. It therefore cannot be given in substance; but must be dissolved, in order to render it capable of a more minute division. We may see, by looking into Wiseman, that this is an old medicine, though seldom given by regular practitioners. How it came to be introduced into so remote a part of the world as Siberia, is not easily found out; but Dr Clerc, author of the *Histoire Naturelle de l'Homme Malade*, assures us, that the sublimate solution has been of use there time out of mind.

It appears to have been totally forgotten in other places, until of late years, when the Baron Van Swieten brought it into vogue; so that now, if we credit Dr Locker, they use no other mercurial preparation at Vienna. The number of patients cured by this remedy alone in the hospital of St Mark, which is under the care of this gentleman, from 1754 to 1761 inclusive, being 4880.

The way to prepare the solution is, to dissolve as much sublimate in any kind of ardent spirit (at Vienna they use only corn-brandy) as will give half a grain to an ounce of solution. The dose to a grown person is one spoonful mixed with a pint of any light ptisan or barley-water, and this to be taken morning and evening: the patients should keep mostly in a warm chamber, and lie in bed to sweat after taking the medicine: their diet should be light; and they ought to drink plentifully throughout the day, of whey, ptisan, or barley-water. If the solution does not keep the belly open, a mild purge must be given from time to time; for Locker observes, that those whom it purges two or three times a-day, get well sooner than those whom it does not purge: he also says, that it very seldom affects the mouth, but that it promotes the urinary and cutaneous discharges. This course is not only to be continued till all the symptoms disappear, but for some weeks longer. The shortest time in which Locker used to let the patients out, was six weeks; and they were continued on a course of decoction of the woods for some weeks after they left off the solution.

This method has been introduced both in Britain and Ireland, though by no means to the exclusion of others; but it appears, that the solution does not turn out so infallible a remedy, either in these kingdoms, or in France, as they say it has done in Germany. It

was seldom ever found to perform a radical cure, and the frequent use of it proved in many cases highly prejudicial. It has therefore been succeeded in practice by a remedy first recommended by Dr Plenck, and since improved by Dr Saunders; consisting of mercury united with mucilage of gum arabic, which is said to render its exhibition perfectly mild and safe. For particulars, we refer to Dr Saunders's treatise.

But a late French writer, supposed to be Dr Petit, in a small book, intitled, *A parallel of the different methods of treating the venereal disease*, insists, that there is neither certainty nor safety in any other method than the repeated frictions with mercurial ointment.

If therefore it is determined to have recourse to the mercurial frictions, the patient must be prepared by going into the warm bath some days successively; having been previously bled if of a plethoric habit, and taking a dose or two of some proper cathartic.

The patient being fitted with the necessary apparatus of flannels, is then to enter on the course.

If the person be of a robust habit, and in the prime of life, we may begin with two drachms of the *unguentum cæruleum fortius*, (Ph. Lond.) which is to be rubbed in about the ankles by an assistant whose hands are covered with bladders: then having intermitted a day, we may expend two drachms more of the ointment, and rest for two days; after which, if no soreness of the mouth comes on, use only one drachm; and at every subsequent friction ascend till the ointment shall reach the trunk of the body; after which the rubbings are to be begun at the wrists, and from thence gradually extended to the shoulders. In order to prevent the mercury from laying too much hold of the mouth, it must be diverted to the skin, by keeping the patient in a constant perspiration from the warmth of the room, and by drinking plentifully of barley-water, whey, or pusan; but if, nevertheless, the mercury should tend to raise a spitting, then, from time to time, we are either to give some gentle cathartic, or order the patient into a vapour-bath: and thus we are to go on, rubbing in a drachm of the ointment every second, third, or fourth night, according as it may be found to operate; and on the intermediate days, either purging or bathing, unless we should choose to let the salivation come on; which, however, it is much better to avoid, as we shall thus be able to throw in a larger quantity of mercury.

It is impossible to ascertain the quantity of mercury that is necessary to be rubbed in, as this will vary according to circumstances; but we are always to continue the frictions for a fortnight at least, after all symptoms of the disease shall have totally disappeared; and when we have done with the mercury, warm bathing, and sudorific decoctions of the woods, are to be continued for some time longer.

Some venereal cases are so very obstinate as not to yield to mercury; and some of the particular symptoms will remain even after repeated courses, particularly the nodes and swellings of the periosteum. These are sometimes cured by a decoction of the roots of mezerion, an ounce being boiled in a gallon of water down to two quarts; a pint of this decoction is to be consumed in the course of a day. Such other symptoms as are found to resist mercury, may perhaps be

conquered by a long continuance of the decoction of *lasfaparilla*, aided by the warmth of a southern climate.

This is a general sketch of the methods of treatment for the confirmed lues; but for a complete history of the disease, and for ample directions in every situation, we refer to Astruc, and his abridger Dr Chapman.—We have to add, however, that a method of curing this disease by fumigation has been lately recommended in France; but it seems not to meet with great encouragement. The most recent proposal for the cure of the venereal disease is that of Mr Clare, and consists in rubbing a small quantity of mercury on the inside of the cheek; by which means we not only avoid the inconveniences of unction, but also the purgative effects that are often produced by this medicine when taken into the stomach.

# SCORBUTUS, the SCURVY. Genus LXXXVI.

Scorbutus, *Saww.* gen. 391. *Lin.* 223. *Vog.* 318. *Sag.* 127. *Boerb.* 1148. *Hoffm.* III. 369. *Juncb.* 91. *Lind* on the Scurvy. *Hulme* de scorbuto. *Roupe* de morbis navigantium.

*Description.* The first indication of the scorbutic diathesis, is generally a change of colour in the face, from the natural and healthy look to a pale and bloated complexion, with a listlessness, and aversion from every sort of exercise; the gums soon after become itchy, swell, and are apt to bleed on the slightest touch; the breath grows offensive; and the gums, swelling daily more and more, turn livid, and at length become extremely fungous and putrid, as being continually in contact with the external air; which in every case favours the putrefaction of substances disposed to run into that state, and is indeed absolutely requisite for the production of actual rottenness.

The symptoms of the scurvy, like those of every other disease, are somewhat different in different subjects, according to the various circumstances of constitution; and they do not always proceed in the same regular course in every patient. But what is very remarkable in this disease, notwithstanding the various and immense load of distress under which the patients labour, there is no sickness at the stomach, the appetite keeps up, and the senses remain entire almost to the very last: when lying at rest, they make no complaints, and feel little distress or pain; but the moment they attempt to rise, or stir themselves, then the breathing becomes difficult, with a kind of straitsness or catching, and great oppression, and sometimes they have been known to fall into a syncope. This catching of the breath upon motion, with the loss of strength, defection of spirit, and rotten gums, are held as the essential or distinguishing symptoms of the disease. The skin is generally dry, except in the very last stage, when the patients become exceedingly subject to faintings, and then it grows clammy and moist: in some it has an ashen appearance; but much oftener it is smooth and shining; and, when examined, is found spread over with spots not rising above the surface, of a reddish, bluish, livid, or purple colour, with a sort of yellow rim round them. At first these spots are for the most part small, but in time they increase to large blotches. The legs and thighs are the places where they are mostly seen; more rarely on the head and face. Many have

have a swelling of the legs, which is harder, and retains the impression of the finger longer, than the common dropical or truly cedematous swellings. The slightest wounds and bruises, in scorbutic habits, degenerate into foul and untoward ulcers. And the appearance of these ulcers is so singular and uniform, that they are easily distinguished from all others. Scorbutic ulcers afford no good digestion, but a thin and fetid ichor mixed with blood, which at length has the appearance of coagulated gore lying caked on the surface of the fore, not to be separated or wiped off without some difficulty. The flesh underneath these sloughs feels to the probe soft and spongy, and is very putrid. Neither detergents, nor escharotics, are here of any service; for though such sloughs be with great pains taken away, they are found again at the next dressing, where the same sanguineous putrid appearance always presents itself. Their edges are generally of a livid colour, and puffed up with excrescences of proud flesh arising from below the skin. As the violence of the disease increases, the ulcers shoot out a soft bloody fungus, which often rises in a night's time to a monstrous size; and although destroyed by cauterics, actual or potential, or cut away with the knife, is found at next dressing as large as ever. It is a good while, however, before these ulcers, bad as they are, come to affect the bones with rottenness.—These appearances will always serve to assure us that an ulcer is scorbutic; and should put us on our guard with respect to the giving mercurials, which are the most pernicious things that can be administered in these cases.

Scorbutic people, as the disease advances, are seldom free from pains; though they have not the same seat in all, and often in the same person shift their place. Some complain of universal pain in all their bones; but most violent in the limbs, and especially the joints: the most frequent seat of their pain, however, is some part of the breast. The pains of this disease seem to arise from the distraction of the sensible fibres, by the extravasated blood being forced into the interstices of the periosteum and of the tendinous and ligamentous parts; whose texture being so firm, the fibres are liable to the higher degrees of tension, and consequently of pain.

The state of the bowels are various: in some there is an oblique costiveness; in others a tendency to a flux, with extremely fetid stools: the urine is also rank and fetid, generally high-coloured; and, when it has stood for some hours, throws up an oily scum on the surface. The pulse is variable; but most commonly slower and more feeble than in the time of perfect health. A stiffness in the tendons, and weakness in the joints of the knees, appear early in the disease: but as it grows more inveterate, the patients generally lose the use of their limbs altogether; having a contraction of the flexor-tendons in the ham, with a swelling and pain in the joint of the knee. Some have their legs monstrously swelled, and covered over with livid spots or ecchymoses; others have had tumours there; some, though without swelling, have the calves of the legs and the flesh of the thighs quite indurated. As persons far gone in the scurvy are apt to faint, and even expire, on being moved and brought out into the fresh air, the utmost care and circumspection are requisite when it is necessary to stir or remove them.

Scorbutic patients are at all times, but more espe-

cially as the disease advances, extremely subject to profuse bleedings from different parts of the body; as from the nose, gums, intestines, lungs, &c. and from their ulcers, which generally bleed plentifully if the fungus be cut away. It is not easy to conceive a more dismal and diversified scene of misery than what is beheld in the third and last stage of this distemper; it being then that the anomalous and more extraordinary symptoms appear, such as the bursting out of old wounds, and the dissolution of old fractures that have been long united.

*Causes.* The term *scurvy* hath been indiscriminately applied, even by physicians, to almost all the different kinds of cutaneous foulness; owing to some writers of the last century, who comprehended such a variety of symptoms under this denomination, that there are few chronic distempers which may not be so called, according to their scheme: but the disease here meant is the true putrid scurvy, so often fatal to seamen, and to people pent up in garrisons without sufficient supplies of sound animal-food and fresh vegetables; or which is sometimes known to be endemic in certain countries, where the nature of the soil, the general state of the atmosphere, and the common course of diet, all combine in producing that singular species of corruption in the mass of blood, which constitutes this disease; for the appearances, on dissecting scorbutic subjects, sufficiently shew that the scurvy may, with great propriety, be termed a disease of the blood.

Dr Lind has, in a postscript to the third edition of his treatise on the scurvy, given the result of his observations drawn from the dissection of a considerable number of victims to this fatal malady, from which it appears that the true scorbutic state, in an advanced stage of the distemper, consists in numerous effusions of blood into the cellular interstices of most parts of the body, superficial as well as internal; particularly the gums, and the legs; the texture of the former, being almost entirely cellular, (and these cells naturally occupied by pure blood), and the generally dependent state of the latter, rendering these parts, of all others in the whole body, the most apt to receive, and retain, the stagnant blood, when its crisis comes to be destroyed, and it loses that glutinous quality which, during health, hinders it from escaping thro' the pores in the coats of the blood-vessels.

A dropical indispotion, especially in the legs and breast, was frequently, but not always, observed in the subjects that were opened, and the pericardium was sometimes found distended with water: the water, thus collected, was often so sharp as to shrivel the hands of the dissector; and in some instances, where the skin happened to be broken, it irritated and festered the wound.

The fleshy fibres were found so extremely lax and tender, and the bellies of the muscles in the legs and thighs so stuffed with the effused stagnating blood, that it was always difficult, and sometimes impossible, to raise or separate one muscle from another. He says that the quantity of this effused blood was amazing; in some bodies, it seemed that almost a fourth part of the whole mass had escaped from the vessels; and it often lay in large concretions on the periosteum, and in some few instances under this membrane, immediately



mediately on the bowels. And yet, notwithstanding this dissolved and depraved state of the external fleshy parts, the brain always appeared perfectly sound, and the viscera of the abdomen, as well as those in the thorax, were, in general, found quite uncorrupted. There were spots indeed, from extravasated blood, observed on the mesentery, intestines, stomach, and omentum; but these spots were firm, and free from any moistened taint; and, more than once, an effusion of blood, as large as a hand's breadth, has been seen on the surface of the stomach; and what was remarkable, that very subject was not known while living to have made any complaint of sickness, pain, or other disorder, in either stomach or bowels.

These circumstances, and appearances, with many others that are not here enumerated, all prove to a demonstration the putrescent state of the blood: and yet Dr Lind takes no small pains to combat the idea of the scurvy's proceeding from animal-putrefaction; a notion which, according to him, "may, and hath misled physicians to propound and administer remedies for it altogether ineffectual."

He also, in the preface to this third edition, talks of the mischief done by an attachment to delusive theories; says, "it is not probable that a remedy for the scurvy will ever be discovered from a preconceived hypothesis, or by speculative men in the closet, who have never seen the disease, or who have seen at most only a few cases of it;" and adds, "that though a few partial facts and observations may, for a little, flatter with hopes of greater success, yet more enlarged experience must ever evince the fallacy of all positive assertions in the healing art."

Sir John Pringle, however, is of a very different opinion: HE "is persuaded, after long reflection, and the opportunities he has had of conversing with those who, to much sagacity, had joined no small experience in nautical practice, that upon an examination of the several articles which have either been of old approved, or have of late been introduced into the navy, it will appear, that though these means may vary in form and in mode of operating, yet they all some way contribute towards preventing putrefaction; whether of the air in the cloister parts of a ship, of the meats, of the water, of the clothes and bedding, or of the body itself."

What Dr Lind has above advanced is the more strange, as, in the two former editions of his book, he embraced the hypothesis of animal-putrefaction being the cause of the scurvy; and if these effusions of blood, from a destruction of its crasis and the dissolved state of the muscular fibres, together with the rotten condition of the mouth and gums, do not betray putrefecency, it is hard to say what does, or what other name we shall bestow on this peculiar species of depravation which constitutes the scurvy.

The blood, no doubt, derives its healthy properties, and maintains them, from due supplies of wholesome food; while the insoluble, superfluous, effete, and acrid parts, are carried off by the several discharges of stool, urine, and perspiration.

Our senses of taste and smell are sufficient to inform us when our food is in a state of soundness and sweetness, and consequently wholesome; but it is from

chemistry that we must learn the principles on which these qualities chiefly depend.

Experiments of various kinds have proved, that the soundness of animal and vegetable substances depends greatly, if not entirely, on the presence of their aerial principle; since rottenness is never observed to take place without an emission of fixed air from the putrefying substance: and even when putrefaction has made a considerable progress, if air can be transferred, in sufficient quantity, from some other substance in a state of effervescence or fermentation, into the putrid body, the offensive smell of this will be destroyed; and if it be a bit of rotten flesh with which the experiment is made, the firmness of its fibres will be found in some measure restored.

The experiments of Dr Hales, as well as many others made since his time, shew that the aerial principle is greatly connected with, and remarkably abundant in, the gelatinous parts of animal bodies, and in the mucilage or farina of vegetables. But these are the parts of our food which are most particularly nutritive; and Dr Cullen, whose opinion on this as on every other medical subject must be allowed of the greatest weight, affirms (in his Lectures on the Materia Medica), that the substances on which we feed are nutritious only in proportion to the quantities of oil and sugar which they respectively contain. This oil and sugar are blended together in the gelatinous part of our animal-food, and in the mucilaginous and farinaceous part of effluent vegetables; and, while thus intimately combined, are not perceivable by our taste, though very capable of being developed and rendered distinct by the power of the digestive organs; for, in consequence of the changes produced during digestion, (in which, notwithstanding any cavilling that may be raised about terms, fermentation must be allowed to have a principal share), the oily and the saccharine matter become manifest to our senses, as we may see, and taste, in the milk of animals, (which is chiefly chyle, a little advanced in its progress toward sanguification), wherein the oil is observed to separate spontaneously, and from which a quantity of actual sugar may be obtained by a very simple process.

Thus much being premised, we can now readily comprehend how the blood may come to lose those qualities of smoothness, mildness, and tenacity, which are natural to it. For if, in the first place, the fluids, and organs subservient to digestion, should be so far disordered, or debilitated, that the nutritious parts of the food cannot be properly developed, the blood must be defrauded of its due supplies; which will also be the case, if the aliment should not originally contain enough of oily and saccharine matter, or should be so circumstanced, from being dried or salted, as to hinder the ready extrication of the nutritious parts; or lastly, if the natural discharges should be interrupted or suspended, so that the superfluous, acrid, and effete fluids are retained in the general mass; in all these instances the blood must of necessity run into proportionate degrees of depravation.

And hence we may understand how it may possibly happen, that when persons are greatly weakened by some preceding disorder, and at the same time de-

barred the use of proper bodily exercise, the scorbutic diathesis should take place, even though they enjoy the advantages of pure air and wholesome diet. But these are solitary cases, and very rarely seen; for whenever the scurvy seizes numbers, and can be considered as an epidemic disease, it will be found to depend on a combination of the major part, or perhaps all, of the following circumstances:

1. A moist atmosphere, and more especially if cold be joined to this moisture.
2. Too long cessation from bodily exercise, whether it be from constraint, or a lazy slothful disposition.
3. Dejection of mind.
4. Neglect of cleanliness, and want of sufficient clothing.
5. Want of wholesome drink, either of pure water, or fermented liquors.
- And, 6. above all, the being obliged to live continually on salted meats, perhaps not well cured, without a due proportion of the milder farinaceous or mucilaginous vegetables, sufficient to correct the pernicious tendency of the salt, by supplying the bland oil and saccharine matter requisite for the purposes of nutrition.

*Prevention and Cure.* The scurvy may be prevented, by obviating and correcting those circumstances in respect of the non-naturals which were mentioned as contributing to the disease, and laid down as causes. It is therefore a duty highly incumbent on officers commanding at sea, or in garrisons, to use every possible precaution; and, in the first place, to correct the coldness and moisture of the atmosphere, by sufficient fires: in the next, to see that their men be lodged in dry, clean, and well ventilated births, or apartments: thirdly, to promote cheerfulness, and enjoin frequent exercise, which alone is of infinite use in preventing the scurvy: fourthly, to take care that the clothing be proper, and cleanliness of person strictly observed: fifthly, to supply them with wholesome drink, either pure water, or sound fermented liquors; and if spirits be allowed, to have them properly diluted with water, and sweetened with melleas or coarse sugar: and lastly, to order the salted meats to be sparingly used, or sometimes entirely abstained from; and, in their place, let the people live on different compositions of the dried vegetables, fresh meat and recent vegetables being introduced as often as they can possibly be procured.

A close attention to these matters will, in general, prevent the scurvy from making its appearance at all, and will always hinder it from spreading its influence far. But when these precautions have been neglected, or the circumstances such that they cannot be put in practice, and the disease hath actually taken place, our whole endeavour must be to restore the blood to its original state of soundness: and happily, such is the nature of this disease (which confirms the hypothesis that it is seated in the gross fluids, and particularly the blood), that if a sufficiency of new matter, of the truly mild nutritious sort, can be thrown into the circulation while the fleshy fibres retain any tolerable degree of firmness, the patient will recover; and that in a surprisingly short space of time, provided a pure air, comfortable lodgings, sufficient clothing, cleanliness, and exercise, lend their necessary aid.

This being the case, the plan of treatment is to be conducted almost entirely in the dietetic way; as the change in the mass of blood, which it is necessary to

produce, must be brought about by things that can be received into the stomach by pints, or pounds and not by those which are administered in drops or grains, drachms or ounces. For here, as the subtle fluids are not sensibly affected, and there is no disorder of the nervous system, we have no need of those active drugs, which are indispensably necessary in febrile or nervous diseases; the scorbutic diathesis being quite opposite to that which tends to produce a fever, or any species of spasmodic disorder; nay Dr Lind says, he has repeatedly found, that even the infection of an hospital fever is long resisted by a scorbutic habit.

It will now naturally occur to the reader, what those alimentary substances must be which bid the fairest to restore the blood to its healthy state; and he needs scarcely be told, that they are of those kinds which the stomach can bear with pleasure though taken in large quantities, which abound in jelly or mucilage, and which allow these nutritious parts to be easily developed; for though the viscera in scorbutic patients may be all perfectly found, yet we cannot expect, that either the digestive fluids, or organs, should possess the same degrees of power, which enable them, during health, to convert the crude dry farinacea, and the hard salted flesh of animals, into nourishment. We must therefore search for the *antiscorbutic virtue* in the tender sweet flesh of graminivorous animals; in new milk; and in the mucilaginous juices of recent vegetables, whether they be fruits, leaves, or roots. And provided they be fresh, and succulent, and of such mildness as will permit them to be abundantly taken, it is of little importance whether they be sweet or sour, acetic or alkaline; for such is the power of the alimentary fermentation, that by the time the chyle is ready to enter the lacteals, their native qualities are obliterated, and the oily and saccharine matter which lay hid in the mucilage entirely extricated.

The four juices of lemons, oranges, and limes, have been generally held as antiscorbutics in an eminent degree, and their power ascribed to their acid; from an idea that acids of all kinds are the only correctors of putrefaction. But the general current of practical observations shews, and our experiments confirm it, that the virtue of these juices (and, we presume, of every other that has been known to cure the scurvy) depends on their *aërial principle*, and consequently resides in the mucilage, whether it be sweet or sour; accordingly, while perfectly recent and in the mucilaginous state, and especially if mixed with wine and sugar, the juices of any one of these fruits will be found a most grateful and powerful antiscorbutic.

Dr Lind observing, "that the lemon-juice, when given by itself undiluted, was apt, especially if overdosed, to have too violent an operation, by occasioning pain and sickness at the stomach, and sometimes a vomiting; he therefore found it necessary to add wine and sugar. A pint of Madeira wine, and two ounces of sugar, were put to four ounces and a half of juice, and this quantity was found sufficient for weak patients to use in 24 hours: such as were very weak sipped a little of this frequently, according as their strength would permit; others who were stronger took about two ounces of it every four hours; and when the patients grew still stronger, they were allowed eight ounces of lemon-juice in 24 hours."

While

While this very pleasant mixture, which is both a cordial and an antiseptic, may be had, it would be needless to think of prescribing any other; but when the fresh juice cannot be procured, we must have recourse to such other things as may be obtained. But the various modes of combining and administering these, so as to render them perfectly agreeable to the stomach, must always be regulated by circumstances, and therefore it will be in vain to lay down particular directions; since all that we have to do is, to fix on such fruits and other fresh vegetables as can be most conveniently had and taken, and contrive to give them in those forms, either alone or boiled up with flesh-meat into soups, that will allow the patients to consume the greatest quantities.

The first promising alteration from such a course is usually a gentle diarrhoea; and if, in a few days, the skin becomes soft and moist, it is an infallible sign of recovery; especially if the patient gains strength, and can bear being stirred or carried into the open air without fainting.

But if the belly should not be loosened by the use of the fresh vegetables, nor the skin become soft and moist, then they must be assisted by stewed prunes, or a decoction of tamarinds with cream of tartar, in order to abate the costiveness; and by drinking a light decoction of the woods, and warm bathing, in order to relax the pores of the skin; for nothing contributes more to the recovery of scorbutic patients than moderate sweating.

With regard to particular symptoms, antiseptic mouth-waters composed of a decoction of the cortex and tincture of roses, with solution of myrrh, must be used occasionally, in order to cleanse the mouth, and give firmness to the spongy gums. Swelled and indurated limbs, and stiffened joints, must be bathed with warm vinegar, and relaxed by the steam of warm water, repeatedly conveyed to them, and confined to the parts by means of close blankets: ulcers on the legs must never be treated with unctuous applications nor sharp escharotics; but the dressing should consist of lint or soft rags, dipped in a strong decoction of Peruvian bark.

This disease at no time requires, or indeed bears, large evacuations, either by bleeding or purging; and, as hath been already mentioned, the belly must only be kept open by the fresh vegetables, or the mildest laxatives. But we are always to be careful that scorbutic persons, after a long abstinence from greens and fruits, be not permitted to eat voraciously at first, lest they fall into a fatal dysentery.

All this, however, that has been laid down as necessary towards the cure, supposes the patients to be in situations where they can be plentifully furnished with all the requisites; but unhappily these things are not to be procured at sea, and often deficient in garisons: therefore, in order that a remedy for the scurvy might never be wanting, Dr Macbride, in the year 1762, first conceived the notion, that *infusion of malt*, commonly called *wort*, might be substituted for the common antiscorbutics, and it was accordingly tried.

More than three years elapsed, before any account arrived of the experiment's having been made: at length, ten histories of cases were received, wherein

the wort had been tried, with very remarkable success; and this being judged a matter of much importance to the seafaring part of mankind, these were immediately communicated to the public in a pamphlet with the title of *An historical account of a new method of treating the scurvy at sea*.

This was in 1767; but since that time a considerable number of letters and medical journals, sufficient to make up a small volume, were transmitted to the author, particularly by the surgeons of his Majesty's ships that have been employed of late years for making discoveries in the southern hemisphere. Certain it is, that in many instances it has succeeded beyond expectation. In others it has fallen short: but whether this was owing to the untoward situation of the patients, or inattention on the part of the persons who were charged with the administration of the wort, not preparing it properly, or not giving it in sufficient quantity, or to its own want of power, must be collected from the cases and journals themselves.

During Captain Cook's last voyage, the most remarkable, in respect of the healthiness of the crew, that ever was performed, the wort is acknowledged to have been of singular use.

In a letter which this very celebrated and successful circumnavigator wrote to Sir John Pringle, he gives an account of the methods pursued for preserving the health of his people; and which were productive of such happy effects, that he performed "a voyage of three years and 18 days, through all the climates from 52° north to 71° south, with the loss of one man only by disease, and who died of a complicated and lingering illness, without any mixture of scurvy. Two others were unfortunately drowned, and one killed by a fall; so that out of the whole number (118) with which he set out from England, he lost only four.

He says, that much was owing to the extraordinary attention of the admiralty, in causing such articles to be put on board as either by experience or conjecture were judged to tend most to preserve the health of seamen; and with respect to the wort, he expresses himself as follows.

"We had on board a large quantity of *malt*, of which was made *sweet wort*, and given (not only to those men who had manifest symptoms of the scurvy, but to such also as were, from circumstances, judged to be most liable to that disorder) from one or two to three pints in the day to each man, or in such proportion as the surgeon thought necessary, which sometimes amounted to three quarts in the 24 hours: this is without doubt one of the best antiscorbutic sea-medicines yet found out; and, if given in time, will, with proper attention to other things, I am persuaded, prevent the scurvy from making any great progress for a considerable time: but I am not altogether of opinion that it will cure it, in an advanced state, at sea."

On this last point, however, the Captain and his Surgeon differ; for this gentleman positively asserts, and his journal (in Dr Macbride's possession) confirms it, that the infusion of malt did effect a cure in a confirmed case, and at sea.

The malt, being thoroughly dried, and packed up



in small casks, is carried to sea, where it will keep sound, in every variety of climate, for at least two years: when wanted for use, it is to be ground in a hand-mill, and the infusion prepared from day to day, by pouring three measures of boiling water on one of the ground malt; the mixture being well mashed, is left to infuse for 10 or 12 hours, and the clear infusion then strained off. The patients are to drink it in such quantities as may be deemed necessary, from one to three quarts in the course of the 24 hours: a panado is also to be made of it, by adding biscuit, and currants or raisins; and this palatable mels is used by way of solid food. This course of diet, like that of the recent vegetables, generally keeps the bowels sufficiently open; but in cases where costiveness nevertheless prevails, gentle laxatives must be interposed from time to time, together with diaphoretics, and the topical affluents, fomentations and gargles, as in the common way of management.

Captain Cook was also provided with a large stock of *four kroust*; (cabbage-leaves cut small, fermented and stopped in the second stage of fermentation.) A pound of this was served to each man, twice a-week, while they were at sea. He had also a liberal supply of *portable soup*; of which the men had generally an ounce, three days in the week, boiled up with their pease; and sometimes it was served to them oftener; and when they could get fresh greens, it was boiled up with them, and made such an agreeable mels, that it was the means of making the people eat a greater quantity of greens than they would otherwise have done. And what was still of further advantage, they were furnished with sugar, in lieu of butter or oil, which is seldom of the sweetest sort; so that the crew were undoubtedly great gainers by the exchange.

In addition to all these advantages of being so well provided with every necessary, either in the way of diet or medicine, Captain Cook was remarkably attentive to all the circumstances respecting cleanliness, exercise, sufficient clothing, provision of pure water, and purification of the air, in the closer parts of the ship.

Newly brewed *spruce-beer* (made from a decoction of the tops of the spruce-fir, and molasses) is an excellent antiscorbutic; acts in the same way that the wort does, and will be found of equal efficacy, therefore may be substituted. But in situations where neither the one nor the other can be had, a most salutary mels may be prepared from oatmeal, by infusing it in water, in a wooden vessel, till it ferments, and begins to turn fourish; which generally happens, in moderately warm weather, in the space of two days. The liquor is then strained off from the grounds, and boiled down to the consistence of a jelly, which is to be eat with wine and sugar, or with butter and sugar.

Nothing is more commonly talked off, than a *land-scurvy*, as a distinct species of disease from this which has been now described; but no writer has yet given a description so clear as to enable us to distinguish it from the various kinds of cutaneous foulness and eruption, which indeed are vulgarly termed *scorbutic*, but which are akin to the itch or leprosy, and for the most part require mercurials.

## CLXXIV. ELEPHANTIASIS.

Genus LXXXVIII.

Elephantialis, *Sauv.* gen. 302. *Vog.* 321. *Sag.* gen. 128.Elephantia Arabum, *Vog.* 322.

THE best account of this disease is that by Dr Herberden, published in the first volume of the Medical Transactions. According to him, frequently the first symptom is a sudden eruption of tubercles, or bumps of different sizes, of a red colour, more or less intense (attended with great heat and itching), on the b. dy, legs, arms, and face; sometimes in the face and neck alone, at other times occupying the limbs only; the patient is feverish; the fever ceasing, the tubercles remain indolent, and in some degree scirrhous, of a livid or copper colour, and sometimes of the natural colour of the skin, or at least very little altered; and sometimes they after some months ulcerate, discharging a fetid ichorous humour in small quantity, but never laudable pus.

The features of the face swell and enlarge greatly; the part above the eye-brows seems inflated; the hair of the eye-brows falls off, as does the hair of the beard; but our author has never seen any one whose hair has not remained on his head. The *ala nasi* are swelled and scabrous; the nostrils patulous, and sometimes affected with ulcers, which, corroding the cartilage and *septum nasi*, occasion the nose to fall. The lips are tumid; the voice is hoarse; which symptom hath been observed when no ulcers have appeared in the throat, although sometimes both the throat and gums are ulcerated. The ears, particularly the lobes, are thickened, and occupied by tubercles. The nails grow scabrous and rugose, appearing something like the rough bark of a tree; and the distemper advancing, corrodes the parts gradually with a dry fordid scab, or gangrenous ulcer; so that the fingers and toes rot and separate, joint after joint. In some patients the legs seem rather pitted than legs, being no longer of the natural shape, but swelled to an enormous size, and indurated, not yielding to the pressure of the fingers; and the superficies is covered with very thin scales, of a dull whitish colour, seemingly much finer, and not so white as those observed in the *lepra Græcorum*. The whole limb is overpread with tubercles, interspersed with deep fissures; sometimes the limb is covered with a thick moist scabby crust, and not seldom the tubercles ulcerate. In others the legs are emaciated, and sometimes ulcerated; at other times affected with tubercles without ulceration. The muscular flesh between the thumb and fore-finger is generally extenuated.

The whole skin, particularly that of the face, has a remarkably shining appearance, as if it was varnished or finely polished. The sensation is very obtuse, or totally abolished; so that pinching, or puncturing the part, gives little or no uneasiness; and in some patients the motion of the fingers and toes is quite destroyed. The breath is very offensive; the pulse in general weak and slow.

The disease often attacks the patient in a different manner from the above-described, beginning almost insensibly; a few indolent tubercles appearing on various parts of the body or limbs, generally on the legs or arms, sometimes on the face, neck, or breast, and some-

sometimes in the lobes of the ears, increasing by very slow degrees, without any disorder, previous or concomitant, in respect of pain or uneasiness.

To distinguish the distemper from its manner of attacking the patient, our author styles the first *by fluxion*, and the other *by congesion*. That by fluxion is often attended with a crapula, or surfeit from gross foods; whereby, perhaps, the latent seeds of the disorder yet dormant in the mafs of blood are excited; and probably from frequent observations of his kind (the last meal always having the blame laid on it), it is, that, according to the received opinion there, either fish, (the tunny, mackrel, and shell-fish, in particular), melons, cucumbers, young garden-beans, or mulberries, eaten at the same meal with butter, cheese, or any preparation with milk, are judged liable to produce the distemper, and are accordingly religiously avoided.

Violent commotions of the mind, as anger, fear, and grief, have more than once been observed to have given rise to the disorder; and more frequently, in the female sex, a sudden suppression of an accustomed evacuation, by bathing the legs and feet in cold water at an improper season.

The disorder by fluxion is what is the ofteneft endeavoured to be remedied by timely application; that by congesion, not being so conspicuous, is generally either neglected or endeavoured to be concealed, until perhaps it is too late to be cured, at least unless the patients would submit to a longer course of medicine and stricter regimen of diet than they are commonly inclined to do.

Several incipient disorders by fluxion have been known to yield to an antiphlogistic method, as bleeding, *sal diuret.* in the saline draughts, and a solution of *cremor tartari* in water, for their common drink, (by this means endeavouring to precipitate part of the peccant matter, perhaps too gross to pass the pores by the kidneys); and when once the fever is overcome, the *cort. Peruv. cum cort. saffras*, is the only method to be relied on. The only topical medicine prescribed by Dr Heberden was an attenuating embrocation of brandy and alkaline spirit. By the same method some confirmed cases have been palliated. But, excepting in one patient, he never saw or heard of a confirmed elephantiasis radically cured. He adds, however, that he never met with another possessed with prudence and perseverance enough to prosecute the cure as he ought.

#### CLXXV. LEPRA, the LEPROSY. Genus LXXXVIII.

Lepra, *Sauv.* gen. 303. *Lin.* 262. *Sag.* 129.  
*Lepra Græcorum, Vog.* 320.

THIS distemper is but little known to physicians in the western parts of Europe. Wallis tells us, that it first begins with red pimples, or pustules, breaking out in various parts of the body. Sometimes they appear single; sometimes a great number arise together, especially on the arms and legs: as the disease increases, fresh pimples appear, which, joining the former, make a sort of clusters; all which enlarge their borders, and spread in an orbicular form. The superficials of these pustules are rough, whitish, and scaly; when they are scratched the scales fall off, upon which a thin ichor oozes out, which soon dries and hardens into a scaly

crust. These clusters of pustules are at first small and few; perhaps only three or four in an arm or leg, and of the size of a silver penny. But if the disease be suffered to increase, they become more numerous, and the clusters increase to the size of a crown-piece, but not exactly round. Afterwards it increases to such a degree, that the whole body is covered with a leprous scurf.—The cure of this distemper is the same with that of the ELEPHANTIASIS.

#### CLXXVI. FRAMBOESIA, the YAWS. Genus LXXXIX.

Framboesia. *Sauv.* gen. 125. *Sag.* 125.

*Description* THE description which is given of this distemper by the anonymous author of a paper in the sixth volume of the Edinburgh Medical Essays, (art. 76.) differs, in some circumstances, from one that Sauvages received from M. Virgile, an eminent surgeon of Montpellier, who practised 12 years in the island of St Domingo; and therefore he distinguishes the *framboesia* into two species, *Guineensis*, and *Americana*.

The *framboesia Guineensis* is said by the first mentioned writer to be so common on the coast of Guinea and other parts of Africa, that it seldom fails to attack each individual of both sexes, one time or other, in the course of their lives; but most commonly during childhood or youth. "It makes its appearance in little spots on the cuticle, level with the skin, at first no larger than a pin's head, which increase daily, and become protuberant like pimples: soon after, the cuticle frets off, and then, instead of finding pus, or ichor, in this small tumour, only white sloughs or sordes appear, under which is a small red fungus, growing out of the cutis, increasing gradually to very different magnitudes, some less than the smallest wood strawberry, some as big as a raspberry, and others exceeding in size even the largest mulberries; which berries they very much resemble, being knobbed as they are." These protuberances, which give the name to the disease, appear on all parts of the body: but the greatest numbers, and the largest sized, are generally found in the groins, and about the pudenda or anus; in the arm-pits, and on the face: when the yaws are very large, they are few in number; and when remarkably numerous, they are less in size. The patients, in all other respects, enjoy good health, do not lose their appetite, and seem to have little other uneasiness than what the sores occasion.

Mr Virgile describes the species of yaws that is common among the Negroes of St Domingo, and which Sauvages has termed *framboesia Americana*, as beginning from an ulcer that breaks out indiscriminately in different parts of the body, though most commonly on the legs; at first superficial, and not different from a common ulcer in any other circumstances save its not healing by the usual applications; sooner or later, numerous fungous excrescences break out on the surface of the body as before described, like little berries, moist, with a reddish mucus. Besides these, the soles of the feet and palms of the hands become raw, the skin fretting off, so as to leave the muscles bare; these excoriations are sometimes moist with ichor and sometimes dry, but always painful, and consequently very distressing. They are also mentioned by the author of the

the article in the Medical Essays; and both he and M. Virgile observe, that there is always one excrescence, or yaw, of an uncommon size, which is longer in falling off than the others, and which is considered as the *master-yaw*, and so termed. These two, are the only accounts that have hitherto been published of this disease.

The yaws may be communicated by any kind of contact; nay, it is even believed that flies often convey the infection, when, after having gorged themselves with the virulent matter by sucking the ulcers of those who are diseased, they make punctures in the skin of such as are found, and thus inoculate them; in consequence of which, the disorder will soon appear, provided the *morbific disposition* of body be present.

It is believed, that the disease never appears twice in the same person; since all the Negroes who have had the yaws in Africa, and have been cured there, remain exempt from the disorder ever after; and the writer of the paper in the Medical Essays affirms, that, in nine years practice in the West Indies, he never knew any patient to relapse after having been once thoroughly cured.

*Prognosis.* The yaws are not dangerous, if the cure be skillfully managed at a proper time; but if the patient has been prematurely salivated, or has taken any quantity of mercury, and his skin been suddenly cleared thereby, the cure will be very difficult, if not impracticable.

*Cure.* This is effected by mercurial salivation, after the virulent matter has been completely thrown out to the surface of the body by sudorifics. The following are the particular directions given on this head by the author of the article in the Medical Essays. The yaws being an infectious disease, as soon as they begin to appear on a Negro, he must be removed to a house by himself; or, if it is not certain whether the eruption be the yaws or not, shut him up seven days, and look on him again, as the Jews were commanded to do with their lepers, *Lev. xiii.* and in that time you may be commonly certain.

As soon as you are convinced that it is the yaws, give a bolus of flowers of sulphur, with camphire and theriac. Repeat this bolus every night for a fortnight or three weeks, or till the yaws come to the height; that is, when they neither increase in size or number: then throw your patient into a gentle salivation with calomel given in small doses, without farther preparation; five grains repeated once, twice, or thrice a-day, is sufficient, as the patient can bear it. If he spits a quart in 24 hours, it is enough. Generally, when the salivation is at this height, all the yaws are covered with a dry scaly crust or scab; which, if numerous, look terribly. These fall off daily in small white scales; and in ten or twelve days leave the skin smooth and clean. Then the calomel may be omitted, and the salivation permitted to go off of itself. [A dram of corrosive sublimate dissolved in an ounce of rum or brandy, and the solution daubed on the yaws, will clear the skin in two days time.]

After the salivation, sweat the patient twice or thrice in a frame or chair, with spirits of wine; and give an alternative electuary of æthiops and gum guaiac. He may likewise use the decoction of guaiacum and sassafras fermented with melasses, for his constant drink

while the electuary is taking, and a week or a fortnight after the electuary is spent.

The master-yaw must be consumed an eighth or a tenth part of an inch below the skin, with *Mercur. corrosif. rub. & alum. vss. an. part. equal.* and digested with *Ung. basil. flav. ʒj.* and *mercur. corrosif. rub. ʒj.* and cicatrized with lint pressed out of spirits of wine, and with the vitriol fione.

After the yaws are cured, some patients are afflicted with carbuncles in their feet; which sometimes render them incapable of walking, unless with pain. The method of cure is, by bathing and paring, to destroy the cuticle, and then proceed as in the master-yaw. The gentle escharotics are to be preferred, especially here; and all imaginable care is to be taken to avoid the tendons and periosteum.

To children under six or seven years old, at the proper time of salivating, (when the yaws are come to their full growth), give a grain or two of calomel in white sugar, once a-day, once in two days, or once in three days, so as only to keep their mouths a little sore till the yaws dry, and, falling off in white scales, leave the skin clean. This succeeds always, but requires a longer time than in adults.

In St Domingo they salivated by unction; but it does not appear that success always followed this practice. It is also usual in that island to give the solution of corrosive sublimate, along with a decoction of sarsaparilla. Twelve ounces of this root, and 12 pounds of the coarsest sugar, macerated for 15 days in 12 quarts of water, is mentioned as a specific, and said to be the prescription of an English physician; the dose is four ounces every sixth hour.

#### CLXXVII. TRICHOMA, the PLICA POLONICA, or Plaited Hair. Genus XC.

*Trichoma, Sawo.* gen. 311. *Sag.* 137.

*Plica, Lin.* 313.

*Plica five rhopalosis, Vog.* 323.

THIS disorder is only met with in Poland and Lithuania, and consists of several blood-vessels running from the head into the ends of the hairs; which cleave together, and hang from the head in broad flat pieces, generally about an ell in length, but sometimes they are five or six yards long; one patient hath more or less of these, up to 20, and sometimes 30. They are painful to the wearer, and odious to every spectator. At the approach of winter an eruptive fever happens to many in these countries: the eruptions principally infect the head, and when at the height an ichorous humour flows from them. In this state they are too tender to admit of being touched, and the matter running down the hairs mats them together; the skin by degrees breaking, the ramifications of the capillary vessels following the course of the hair, or prolonged out of the skin, are increased to a vast length.

No method of relief is known; for if the discharge be checked, or the vessels cut off, the consequence is an increase of more miserable symptoms, and in the issue death. Sennertus says, when all the morbid matter is thrown out of the body the plica fall off spontaneously. He further observes, that the only safe practice in this case is, to solicit the peccant matter to the hairs, to which it naturally tends; and that this is best answered by



by lotions of bear's-breech. Some say that a decoction of the herb club-moss, and its seeds, with which the head is to be washed, is a specific.

## CLXXVIII. ICTERUS, the JAUNDICE.

## Genus XCI.

Icterus, *Lin.* 224. *Vog.* 306. *Boerh.* 918. *Junck.* 90.

Aurigo, *Sauv.* gen. 306. *Sag.* 132.

Cachexia icterica, *Hoffm.* III. 301.

*Description.* The jaundice first shews itself by a listlessness and want of appetite, the patient becomes dull, oppressed, and generally colicive. These symptoms have continued but a very short time, when a yellow colour begins to diffuse itself over the *tunica albuginea*, or white part of the eye, and the nails of the fingers; the urine becomes high-coloured, with a yellowish sediment capable of tinging linen; the stools are whitish or grey. In some there is a most violent pain in the epigastric region, which is considerably increased after meals. Sometimes the patient hath a continual propensity to sleep; but in others there is too great watchfulness; and sometimes the pain is so great, that tho' the patient be sleepy he cannot compose himself to rest. The pains come by fits; and all the women who have had the jaundice and born children, agree, that they are more violent than labour-pains. As the disease increases, the yellow colour becomes more and more deep; an itching is felt all over the skin; and even the internal membranes of the viscera, the bones, and the brain itself, become tinged, as hath been shewn from dissections, where the bones have been found tinged sometimes for years after the jaundice hath been cured.

In like manner, all the secretions are affected with the yellow colour of the bile, which in this disease is diffused throughout the whole mass of fluids. The saliva becomes yellow and bitter; the urine excessively high-coloured, in such a manner as to appear almost black; nay, the blood itself is sometimes said to appear of a yellow colour when drawn from a vein; yet Dr Heberden says that he never saw the milk altered in its colour, even in cases of very deep jaundice. In process of time the blood begins to acquire a tendency to dissolution and putrefaction; which is known by the patient's colour changing from a deep yellow to a black or dark yellow. Hemorrhages ensue from various parts of the body, and the patients frequently die of an apoplexy; though in some the disease degenerates into an incurable dropsy; and there have not been wanting instances of some who have died of the dropsy after the jaundice itself had been totally removed.

*Causes.* As the jaundice consists in a diffusion of the bile throughout the whole system, it thence follows, that whatever may favour this diffusion is also to be reckoned among the causes of jaundice. Many disputes have arisen concerning the manner in which the bile is reformed into the blood; but it is now generally agreed that it is taken up by the lymphatics of the gall-bladder and biliary ducts. Hence, a jaundice may arise from any thing obstructing the passage of the bile into the duodenum, or from any thing which alters the state of the lymphatics in such a manner as to make them capable of absorbing the bile in its natural state. Hence, the jaundice may arise from scirrhi of the liver or other viscera pressing upon the biliary

ducts, and obstructing the passage of the bile; from flatus distending the duodenum, and shutting up the entrance of the ductus communis choledochus into it; from the same orifice being plugged up by viscid bile, or other fordes: but by far the most frequent cause of jaundice is the formation of calculi. These are found of almost all sizes, from that of a small pea to that of a walnut, or bigger; are of different colours; and sometimes appear as if formed in the inward part by crystallization, but of lamellæ on the outer part; tho' sometimes the outward part is covered with rough and shining crystals, while the inward part is lamellated. These enter into the biliary ducts, and obstruct them, causing a jaundice, with violent pain for some time; and which can be cured by no means till the stone is either passed entirely through the ductus communis, or returned into the gall-bladder. Sometimes, in the opinion of many celebrated physicians, the jaundice is occasioned by spasmodic contractions of the biliary ducts; but this is denied by others; and it is not yet ascertained whether these ducts are capable of being affected by spasm or not, as the existence of muscular fibres in them hath not with certainty been discovered. It cannot, however, be denied that violent fits of passion have often produced jaundice, sometimes temporary, but frequently permanent. This hath been by some deemed a sufficient proof of the spasmodic contraction of the ducts; but their opponents suppose, that the agitation occasioned by the passion might push forward some biliary concretion into a narrow part of the duct, by which means a jaundice would certainly be produced, till the concretion was either driven backward or forward into the duodenum altogether.

In a very relaxed state of the body there is also an absorption of the bile, as in the yellow fever; and indeed in all putrid disorders there is a kind of yellowish taint over the skin, though much less than in the true jaundice. The reason of this is, that in these disorders there is usually an increased secretion of bile, commonly of a thinner consistence than in a healthy state, while the orifices of the lymphatics are probably enlarged, and thus ready to absorb a fluid somewhat thicker than what they ought to take up in a healthy state; but these disorders are of short duration in comparison with the real jaundice, which sometimes lasts for many years.

It is observable, that women are more subject to jaundice than men, which probably arises from their more sedentary life; for this, together with some of the depressing passions of the mind, are found to promote the accession of the disease, if not absolutely to produce it. Pregnant women also are frequently attacked by the jaundice, which goes off after their delivery.

*Prognosis.* As jaundice may arise from many different causes, some of which cannot be discovered during the patient's life, the prognosis must on this account be very uncertain. The only cases which admit of a cure are those depending upon biliary concretions, or obstructions of the biliary ducts by viscid bile; for the stones are seldom of such a size but that the ducts will let them pass through, though frequently not without extreme pain. Indeed this pain, though so violent, and almost intolerable to

the sick person, affords the best prognosis; as the physician may readily assure his patient that there is great hope of his being relieved from it. The coming on of a gentle diarrhoea attended with bilious stools, together with the cessation of pain, are signs of the disease being cured. We are not, however, always to conclude, because the disease is not attended with acute pain, that it is therefore incurable; for frequently the passage of a stone through the biliary ducts is accompanied only with a sensation of slight uneasiness.

*Cure.* When the jaundice arises from indurated swellings or scirrhi of the viscera, it is absolutely incurable; nevertheless, as these cannot always be discovered, the physician must proceed in every case of jaundice as if it arose from calculi. The indications here are, 1. To dissolve the concretions; and, 2. To prevent their formation a second time. But unhappily the medical art hath not yet afforded a solvent for biliary concretions. They cannot even be dissolved when taken out of the body either by acids or alkalies, or any thing besides a mixture of oil of turpentine and spirit of wine; and these substances are by far too irritating to be given in sufficient quantity to affect a concretion in the biliary ducts. Boerhaave observes, that diseases of the liver are much worse to cure than those in any other part of the body; because of the difficulty there is in getting at the part affected, and the tedious and round-about passage the blood hath to it. The juice of common grafs hath indeed been recommended as a specific in the jaundice, but on no very good foundation. Clifton observes, that black cattle are subject to biliary concretions when fed with hay or dried straw in winter, but are cured by the succulent grafs in the spring; and Van Swieten tells a strange story of a man who cured himself of the jaundice by living almost entirely on grafs, of which he devoured such quantities, that the farmers were wont to drive him out of their fields: but other practitioners have by no means found this in any degree effectual. The only method of cure now attempted in the jaundice is, to expel the calculus into the intestines; for which vomits and exercise are the principal medicines. The former are justly reckoned the most efficacious medicines, as they powerfully shake all the abdominal and thoracic viscera; and thus tend to dislodge any obstrucing matter that may be contained in them. But if there be a tendency to inflammation, vomits must not be exhibited till bleeding has been premised. We must also proceed with caution if the pain is very sharp; for in all cases where the disease is attended with violent pain, it will be necessary to allay it by opiates before the exhibition of an emetic. There is also danger, that, by a continued use of vomits, a stone which is too large to pass, may be so impacted in the ducts, that it cannot even be returned into the gall-bladder, which would otherwise have happened. In all cases therefore, if no relief follows the exhibition of the second or third dose, it will be prudent to forbear their farther use for some time.

Of all kinds of exercise, that of riding on horseback is most to be depended upon in this disease. It operates in the same manner with vomits, namely, by the shake it gives to the viscera; and therefore the

cautions necessary to be observed in the use of vomits are also necessary to be observed in the use of riding. Cathartics also may be of service, by cleansing the *prima viæ*, and soliciting a discharge of the bile into the intestines; but they must not be of too drastic a nature, or they may produce incurable obstructions, by bringing forward stones that are too large to pass. Anodynes, the warm bath, and saponaceous medicines, are serviceable by their relaxing quality. Soap hath been supposed to do service as a solvent; but this is now found to be a mistake, and it acts in no other way than as a relaxant.

But when all means of relief fail, as in cases of scirrhus, we can then only attempt to palliate the symptoms, and preserve the patient's life as long as possible. This is best accomplished by diuretics; for thus a great quantity of bilious matter is evacuated, and the system is freed from the bad consequences which ensue on its stagnation in the habit. But even this is by no means equal to the common evacuation by stool; nor can all the attempts to supply the want of bile in the intestines, by bitters and other stomachics, restore the patient to his wonted appetite and vigour. If the pain be very violent, we must on all occasions have recourse to opiates; or if the blood hath acquired a tendency to dissolution, it must be counteracted by proper antiseptics.

If the disease goes off, its return must be prevented by a course of tonic medicines, particularly the Peruvian bark and antiseptics: but we can by no means be certain that the jaundice will not return, and that at any imaginable interval; for there may be a number of stones in the gall-bladder, and though one hath passed, another may very quickly follow, and produce a new fit of jaundice; and thus some people have continued to be affected with the distemper, at short intervals, during life.

In the East-Indies, mercury hath been lately recommended as exceedingly efficacious in disorders of the liver, especially those which follow intermitting and remitting fevers. Dr Monro, in his Observations on the means of preserving the health of soldiers, acquaints us, that he has seen some icteric cases which, he thought, received benefit from taking a few grains of *mercurius dulcis* at night, and a purge next morning; and this repeated two or three times a week.

Infants are subject to a temporary jaundice, commonly called the *gum*, soon after birth, the cause of which is not well understood. It differs remarkably from the common jaundice; as, in the latter, the disease is first discoverable in the white of the eyes; but though the skin of infants in the gum is all over yellow, their eyes always remain clear. The disorder goes off spontaneously, or by the use of a gentle purgative or two.

## CLASS IV. LOCALES.

VITIA, *Sauv.* Clafs I. *Lin.* Cl. XI. *Vog.* Cl. X.  
*Sag.* Cl. I.

Plagæ, *Sag.* Cl. II.  
Morbi organici Auctorum.

## ORDER I. DYSÆSTHESIÆ.

Dysæsthesiæ, *Sauv.* Cl. VI. Ord. I. *Sag.* Cl. IX.  
Ord. I.

CLXXIX. CALIGO, the CATARACT.  
Genus XCII.

Caligo, *Sauv.* gen. 153. *Vog.* 288. *Sag.* gen.  
259.

Cataracta, *Lin.* 109.

A *cataract* is an obstruction of the pupil, by the interposition of some opaque substance which either diminishes or totally extinguishes the sight. It is generally an opacity in the crystalline humour. In a recent or beginning *cataract*, the same medicines are to be used as in the *gutta serena*; and they will sometimes succeed. But when this does not happen, and the *cataract* becomes firm, it must be couched, or rather extracted; for which operation, see *SURGERY*.—Dr Buchan says he has resolved a recent *cataract* by giving the patient some purges with calomel, keeping a poultice of fresh hemlock constantly upon the eye, and a perpetual blister on the neck.

CLXXX. AMAUROSIS, the GUTTA SERENA.  
Genus XCIII.

Amaurosis, *Sauv.* gen. 155. *Lin.* 110. *Vog.* 238.  
*Sag.* gen. 261.

Amblyopia, *Lin.* 108. *Vog.* 236.

A *gutta serena* is an abolition of the sight without any apparent cause or fault in the eyes. When it is owing to a decay or wasting of the optic nerve, it does not admit of a cure; but when it proceeds from a compression of the nerves by redundant humours, these may be in some measure drained off, and the patient relieved. For this purpose, the body must be kept open with the laxative mercurial pills. If the patient be young, and of a sanguine habit, he may be bled. Cupping with scarifications on the back part of the head will likewise be of use. A running at the nose may be promoted by volatile salts, stimulating powders, &c. But the most likely means of relieving the patient, are issues or blisters kept open for a long time on the back part of the head, behind the ears, or on the neck; which have been known to restore sight even after it had been for a considerable time lost.—Should these fail, recourse must be had to a mercurial salivation; or, what will perhaps answer the purpose better, 12 grains of the corrosive sublimate of mercury may be dissolved in an English pint and a half of brandy, and a table-spoonful of it taken twice a-day, drinking half a pint of the decoction of sarsaparilla after it.—Of late electricity hath been much celebrated as efficacious, when no other thing could do service. See below on *Electricity*.

In the amaurosis, Dr Porterfield observes, that it is of the utmost consequence to know of how long stand-

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1

ing the disease has been; which is not always easily done if one eye only is affected. This is a very essential point; because an amaurosis of long standing is altogether incurable. Mr Boyle mentions the case of a man who had a cataract for several years without knowing it himself, though others did. He discovered it at last by happening to rub his sound eye, and was surprised to find himself in the dark. When a person therefore has a gutta serena only in one of the eyes, he may think that the eye was but lately lost, though perhaps it hath been so for years before. On the other hand, he may imagine that a recent disease of this kind is really of long standing. But by inquiring at what time he first became subject to mistakes in all actions that require the distance to be exactly distinguished, as in pouring liquor into a glass, snuffing a candle, threading a needle, we may discover the age of the disease, and thence be assisted to form a more just prognostic with respect to its cure. Our author gives an instance of his conjecturing in this manner concerning the case of a young lady who had discovered a loss of sight in one of her eyes only the day before. The disease was thought to be of long standing; but as the Doctor found that she had only been subject to mistakes of the kind abovementioned for about a month, he drew a favourable prognostic, and the disease was cured.

CLXXXI. DYSOPIA, or DEPRAVED VISION.  
Genus XCIV.

Amblyopia, *Sauv.* gen. 154. *Sag.* 258.

THERE are several species referable to this genus, viz.

1. *Dysopia TENEBRARUM*; 2. *Dysopia LUMINIS*.—The former of these is properly the *nyctalops*, or night-blindness, of ancient authors. But amongst both the Greek and Latin writers, there is a direct opposition in the use of this word *nyctalops*; some saying it signifies those who cannot see by night, and others express by it those who cannot see during the day, but during the night.—The difference in the account of this disorder, as to its appearing in the night or in the day, is reconciled by considering it as of the intermitting kind: the difference then will consist in the different times of its approach; so may be called *periodical blindness*. Intermittents appearing in a variety of modes, and the success of the bark in some instances of this sort of blindness, both favour the opinion of its being an intermitting disease of the eyes. See *Lond. Med. Transf.* Vol. I. and *Lond. Med. Obs. and Inquir.* Vol. I. p. 111, &c.

3. *Dysopia DISSITORUM*, (*Presbytopia*); or the defect of those who see only at too great a distance.

4. *Dysopia PROXIMORUM*, (*Myopia*), or the defect of those who are short-sighted.—These are disorders which depend on the original structure or figure of the eye, therefore admit of no cure. The inconveniences arising from them may however be, in some measure, remedied by the help of proper glasses. The former requires the aid of a concave, and the latter of a convex glass.

5. *Dysopia LATERALIS*; a defect by which objects cannot be viewed distinctly but in an oblique position.—Thus, in viewing an object placed on the left, they turn their face and eye to the right, and *vice versa*.—This disorder may proceed from various causes both natural and accidental, some of which admit of no remedy,

27 H

medy,



medy. If it is occasioned by a partial adhesion of the eye-lids, the hand of the surgeon is required: if by a transverse position of the pupil, some mechanical contrivance is necessary; (see *Strabismus*, below.) If it is owing to an *albugo* covering part of the pupil, or to a film rendering a portion of the cornea opaque, the remedy for these affections are to be here applied.

- 457 CLXXXII. PSEUDOBLEPSIS, or IMAGINARY VISION of Objects which do not exist. Genus XCV, *Suffusio*, *Sauv.* gen. 217. *Sag.* 329. *Phantasma*, *Lin.* 73. *Sag.* 289.

THIS very often takes place when the body is diseased, and then the patient is said to be delirious. Sometimes, however, in these cases, it does not amount to delirium; but the person imagines he sees gnats or other insects flying before his eyes; or sometimes, that every thing he looks at hath black spots in it, which last is a very dangerous sign. Sometimes also sparks of fire appear before the eyes; which appearances are not to be disregarded, as they frequently precede apoplexy or epilepsy. Sometimes, however, people have been affected in this manner during life, without feeling any other inconvenience. Such a disorder can rarely if ever be cured.

- 458 CLXXXIII. DYSECOEA, DEAFNESS, or Difficulty of Hearing. Genus XCVI.

- 459 CLXXXIV. PARACUSIS, or Depravation of HEARING. Genus XCVII.

*Paracusis*, *Sauv.* gen. 159. *Sag.* 265. *Syngismus*, *Sauv.* gen. 219. *Sag.* 231.

THE functions of the ear may be injured by wounds, ulcers, or any thing that hurts its fabric. The hearing may likewise be hurt by excessive noise; violent colds in the head; fevers; hard wax; or other substances sticking in the cavity of the ear; too great a degree of moisture or dryness of the ear. Deafness is very often the effect of old age, and is incident to most people in the decline of life. Sometimes it is owing to an original fault in the structure or formation of the ear itself. When this is the case it admits of no cure; and the unhappy person not only continues deaf, but generally likewise dumb, for life.

When deafness is the effect of wounds or ulcers of the ears, or of old age, it is not easily removed. When it proceeds from cold of the head, the patient must be careful to keep his head warm, especially in the night; he should likewise take some gentle purges, and keep his feet warm, and bathe them frequently in lukewarm water at bed-time. When deafness is the effect of a fever, it generally goes off after the patient recovers. If it proceeds from dry wax sticking in the ears, it may be softened by dropping oil into them; afterwards they must be syringed with warm milk and water.

If deafness proceeds from dryness of the ears, which may be known by looking into them, half an ounce of the oil of sweet almonds, and the same quantity of liquid apodeloch, or tincture of asafetida, may be mixed together, and a few drops of it put into the ear every night at bed-time, stopping them afterwards with a little wool or cotton. Some, instead of oil, put a small slice of the fat of bacon into each ear,

which is said to answer the purpose very well.—When the ears abound with moisture, it may be drained off by an issue or seton, which should be made as near the affected parts as possible.

Some, for the cure of deafness, recommend the gall of an eel mixed with spirit of wine, to be dropped into the ear; others, equal parts of Hungary-water and spirit of lavender. Etmueller extols amber and musk; and Brookes says, he has often known hardness of hearing cured by putting a grain or two of musk into the ear with cotton-wool. But these and other applications must be varied according to the cause of the disorder.

Though such applications may sometimes be of service, yet they much oftener fail, and frequently they do hurt. Neither the eyes nor ears ought to be tampered with; they are tender organs, and require a very delicate touch. For this reason, what we would chiefly recommend in deafness, is to keep the head warm. From whatever cause the disorder proceeds, this is always proper; and more benefit has often been derived from it alone, in the most obstinate cases of deafness, than from any medicines whatever.

- CLXXXV. ANOSMIA, or Defect of SMELLING. Genus XCVIII.

*Anosmia*, *Sauv.* gen. 156. *Lin.* 113. *Vog.* 248. *Sag.* 262.

*Cause.* THE sense of smelling may be diminished or destroyed by diseases; as, the moisture, dryness, inflammation or suppuration of that membrane which lines the inside of the nose, commonly called the *olfactory membrane*; the compression of the nerves which supply this membrane, or some fault in the brain itself at their origin. A defect, or too great a degree of solidity, of the small spongy bones of the upper jaw, the caverns of the forehead, &c. may likewise impair the sense of smelling. It may also be injured by a collection of fetid matter in those caverns, which keeps constantly exhaling from them. Few things are more hurtful to the sense of smelling than taking great quantities of snuff.

*Cure.* When the nose abounds with moisture, after gentle evacuations, such things as tend to take off irritation and coagulate the thin sharp serum may be applied; as the oil of anise mixed with fine flour, camphire dissolved in oil of almonds, &c. The vapours of amber, frankincense, gum-mastic, and benjamin, may likewise be received into the nose and mouth. For moistening the mucus when it is too dry, some recommend snuff made of the leaves of marjoram, mixed with oil of amber, marjoram, and aniseed; or a sternutatory of calcined white vitriol, 12 grains of which may be mixed with two ounces of marjoram-water and filtrated. The steam or vapour of vinegar upon hot iron received up the nostrils is likewise of use for softening the mucus, opening obstructions, &c.

If there be an ulcer in the nose, it ought to be dressed with some emollient ointment, to which, if the pain be very great, a little laudanum may be added. If it be a venereal ulcer, it is not to be cured without mercury. In that case, the solution of the corrosive sublimate in brandy may be taken, as directed in the gutta serena. The ulcer ought likewise to be washed with

PRACTICE with it; and the fumes of cinnabar may be received up the nostrils.

If there be reason to suspect that the nerves which supply the organs of smelling are inert or want stimulating, volatile salts, strong snuffs, and other things which occasion sneezing, may be applied to the nose. The forehead may likewise be anointed with balsam of Peru, to which may be added a little of the oil of amber.

461 **CLXXXVI. AGHEUSTIA**, or *Defect of TASTING*.  
Genus XCIX.

Ageusia, *Sauv. gen.* 157. *Sag.* 263.

Ageusia, *Lin.* 114.

Apogeusia, *Vog.* 449.

*Cause.* The taste may be diminished by crusts, filth, mucus, aphthæ, pellicles, warts, &c. covering the tongue; it may be depraved by a fault of the saliva, which, being discharged into the mouth, gives the same sensation as if the food which the person takes had really a bad taste; or it may be entirely destroyed by injuries done to the nerves of the tongue and palate. Few things prove more hurtful either to the sense of tasting or smelling than obstinate colds, especially those which affect the head.

*Cure.* When the taste is diminished by filth, mucus, &c. the tongue ought to be scraped, and frequently washed with a mixture of water, vinegar, and honey, or some other detergent. When the saliva is vitiated, which seldom happens unless in fevers or other diseases, the curing of the disorder is the cure of this symptom. To relieve it, however, in the mean time, the following things may be of use: if there be a bitter taste, it may be taken away by vomits, purges, and other things which evacuate bile: what is called a *nocturnal taste*, arising from putrid humours, is corrected by the juice of citrons, oranges, and other acids: a salt taste is cured by plentiful dilution with watery liquors: an acid taste is destroyed by absorbents and alkaline salts, as powder of oyster-shells, salt of wormwood, &c.

When the sensibility of the nerves which supply the organs of taste is diminished, the chewing of horse-radish, or other stimulating substances, will help to recover it.

462 **CLXXXVII. ANÆSTHESIA**, or *Defect of the Sense of FEELING*. Genus C.

*Sauv. gen.* 161. *Lin.* 218. *Vog.* 267.

*Causes, &c.* This sense may be hurt by any thing that obstructs the nervous influence, or prevents its being regularly conveyed to the organs of touching, as pressure, extreme cold, &c. It may likewise be hurt by too great a degree of sensibility, when the nerve is not sufficiently covered by the cuticle or scarfskin, or where there is too great a tension of it, or it is too delicate. Whatever disorders the functions of the brain and nerves, hurts the sense of touching. Hence it appears to proceed from the same general causes as palsy and apoplexy, and requires nearly the same method of treatment.

In a *stupor*, or defect of touching, which arises from an obstruction of the cutaneous nerves, the patient must first be purged; afterwards such medicines as excite the action of the nerves, or stimulate the sys-

tem, may be used. For this purpose the spirit of hartshorn, *sal volatile delfsum*, horse-radish, &c. may be taken inwardly; the disordered parts, at the same time, may be frequently rubbed with fresh nettles or spirit of *sal ammoniac*. Blisters and sinapisms applied to the parts will likewise be of use; as also warm bathing, especially in the natural hot baths.

ORDER II. DYSOREXIA.

SECT. I. APPETITUS ERRONEI.

Morositates, *Sauv. Clafs VIII.* Order II. *Sag.*

Clafs XIII. Order II.

Pathetici, *Lin.* Clafs V. Order II.

Hyperæstheses, *Vog.* Clafs VII.

**CLXXXVIII. BULIMIA**, INSATIABLE HUNGER, or *Canine Appetite*. Genus CI.

Bulimia, *Sauv. gen.* 223. *Lin.* 79. *Sag.* gen. 335.

Bulimus, *Vog.* 296.

Addephagia, *Vog.* 297.

Cynorexia, *Vog.* 298.

This disease is commonly owing to some fault in the stomach or viscera, by which the aliments are thrown out too soon; and unless the person is indulged in his desire for eating, he frequently falls into fainting fits. Sometimes it is attended with such a state of the stomach that the aliment is rejected by vomit almost immediately after being swallowed; after which, the appetite for food returns as violent as ever. Such things are proper for the cure as may enable the stomach to perform its office: chalybeates and other tonics will generally be proper. In some, brandy drunk in a morning hath been useful; and frequent smoking tobacco hath relieved some. Oil, fat meat, pork, opiates, and in short every thing which in a sound person would be most apt to pall the appetite, may also be used as temporary expedients, but cannot be expected to perform a cure. In some the pylorus has been found too large; in which case the disease must have been incurable.

**CLXXXIX. POLYDIPSIA**, EXCESSIVE THIRST. Genus CII.

Polydipsia, *Sauv. gen.* 224. *Lin.* 80. *Vog.* 275. *Sag.* 336.

This is almost always symptomatic; and occurs in fever, dropsy, fluxes, &c.

**CXC. PICA**, LONGING, or *False Appetite*. Genus CIII.

Pica, *Sauv. gen.* 222. *Sag.* 334.

Citta, *Lin.* 78.

Allotriophagia, *Vog.* 299.

Malacia, *Vog.* 300.

The pica is also symptomatic of chlorosis, pregnancy, &c. See the article *LONGING* in the order of the Alphabet.

**CXCI. SATYRIASIS**. Genus CIV.

Satyriasis, *Sauv. gen.* 228. *Lin.* 81. *Sag.* 340.

*Satyriasis* is a violent desire of venery in men, even so that reason is depraved by it. The pulse is quick, and the breathing short; the patient is sleepless, thirsty,

thirsty, and loathes his food; the urine is evacuated with difficulty, and a fever soon comes on. The nature and cure are much the same as are those of the following disease.

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**CXCII. NYPHOMANIA, or FUROR UTERINUS.**  
Genus CV.

Nymphomania, *Sauv.* gen. 229. *Sag.* 341.  
Satyriasis, *Lin.* 81.

THE *furor uterinus* is a species of madness, or an high degree of hysterics. Its immediate cause is a preternatural irritability of the uterus and pudenda of women (to whom the disorder is proper), or an unusual acrimony of the fluids in these parts. — Its presence is known by the wanton behaviour of the patient: she speaks and acts with unrestrained obscenity; and as the disorder increases, she scolds, cries, and laughs, by turns. While reason is retained she is silent, and seems melancholy, but her eyes discover an unusual wantonness. The symptoms are better and worse, until the greatest degree of the disorder approaches, and then by every word and action her condition is too manifest. — In the beginning a cure may be hoped for; but if it continues, it degenerates into a mania. — In order to the cure, bleed in proportion to the patient's strength. Camphor in doses of 15 or 20 grains, with nitre, and small doses of the *tinct. Theb.* should be repeated at proper intervals. Some venture to give the *jac. saturn.* in doses of three to five grains. Besides bleeding, cooling purges should also be repeated in proportion to the violence of symptoms, &c. What is useful in maniacal and hypochondriac disorders, is also useful here, regard being had to sanguine or phlegmatic habits, &c. When delirium is at the height, give opiates to compose; and use the same method as in a phrenitis or a mania. Injections of barley-water, with a small quantity of hemlock-juice, according to Riverius, may be frequently thrown up into the uterus: this is called *specifics*; but matrimony, if possible, should be preferred.

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**CXCIII. NOSTALGIA, a Vehement DESIRE of REVISITING one's COUNTRY.** Genus CVI.

Nostalgia, *Sauv.* gen. 226. *Lin.* 83. *Sag.* 338.  
This is to be reckoned a species of melancholy.

**SECT. II. APPETITUS DEFICIENTES.**

Anepithymia, *Sauv.* Class VI. Ord. II. *Sag.* IX.  
Ord. II.  
Privativia, *Lin.* Class VI. Order III.  
Adynamia, *Vog.* Class VI.

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**CXCIV. ANOREXIA, Want of APPETITE.**  
Genus CVII.

Anorexia, *Sauv.* gen. 162. *Lin.* 116. *Vog.* 279.  
*Sag.* 268.

THE anorexia is symptomatic of almost all diseases, but seldom appears as a primary. See ANOREXIA in the order of the alphabet.

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**CXCV. ADIPSIA, or Want of THIRST.**  
Genus CVIII.

Adipsia, *Sauv.* gen. 163. *Lin.* 117. *Vog.* 281. *Sag.* 269.

THIS by Dr Cullen is reckoned to be always symptomatic of some distemper affecting the *senferium commune*.

**CXCVI. ANAPHRODISIA, Impotence to VENERY.**  
Genus CIX.

Anaphrodisia, *Sauv.* gen. 164. *Sag.* 270.  
Alechnia, *Lin.* 119.  
Agenesia, *Vog.* 283.

For this, see the article IMPOTENCE in the alphabetical order.

**ORDER III. DYSCINESIÆ.**

**CXCVII. APHONIA, or Loss of VOICE.**  
Genus CX.

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Aphonia, *Sauv.* gen. 166. *Lin.* 115. *Vog.* 253.  
*Sag.* 272.

THE loss of voice may proceed from various causes. If one of the recurrent nerves, which are formed by the *par. vagum* and the *nervus accessorius*, and reach the larynx, is cut, the person is capable of only as it were a half-pronunciation; but if both are cut, the speech and voice are both lost. The loss of speech happening in hysterical patients is also called *aphonia*; but more properly that loss of speech is thus named which depends on some fault of the tongue.

Seeing that the motion of any part is destroyed, or lessened at least, by the interception of the nervous fluid in its passage thither, and that the nerves destined for the motion of the tongue arise principally from the fifth pair, it appears that the seat of this disorder is in the said fifth pair of nerves, and that the immediate cause is a diminution or total destruction of the nervous fluid through them. Hence a palsy of the tongue, which is either antecedent or subsequent to hemiplegic or apopleptic disorders, demand our utmost attention.

If an aphonia appears alone, it generally bespeaks an approaching hemiplexy or apoplexy; but if it succeeds these disorders, and is complicated with a weak memory and a sluggishness of the mental powers, it threatens their return. That aphony usually terminates the best, which proceeds from a stagnation of ferous humours compressing the branches of the fifth pair of nerves, which run to the tongue; but it is no less afflictive to the patient, and is very obstinate of cure.

Other causes of this disorder are, the striking in of eruptions on the skin, a congestion of blood in the fauces and tongue, obstructed periodical evacuations in plethoric habits, spasmodic affections, worms, a crumb of bread falling into the larynx, fear, too free a use of spirituous liquors; also whatever destroys the ligaments which go from the arytenoid to the thyroid cartilages, will destroy the voice.

THE *prognostics* vary according to the cause or causes. That species which is owing immediately to spasms, soon gives way on the removal of them. If a palsy of the tongue is the cause, it is very apt to return, if relieved, but often continues incurable.

In order to the *cure*, endeavour first to remove whatever obstructs the influx of the nervous fluid into the tongue, and secondly to strengthen the weak parts.



**ACTING** parts. These general intentions, in all cases, being regarded, the particular causes must be removed as follows.

If worms are the cause, antispasmodics give present relief, but the cure depends on the destruction of these vermin.—In case of a congestion of blood about the head, bleeding and nitrous antispasmodics are to be used.—That species of aphony which remains after the shock of an hemiplexy or apoplexy, requires blisters to be applied to the nape of the neck; other means are rarely effectual.—If spasmodic contractions about the fauces and tongue are the cause, external pargories are of the greatest service, anodyne antispasmodics may be laid under the tongue, and the feet bathed in warm water; carminative clysters also are useful.—When a palsy of the tongue produces this complaint, evacuations, according to the patient's habit, must be made, and warm nervous medicines must be externally applied, and internally administered; blisters also should be placed between the shoulders.—In case of repelled cuticular eruptions, sudorifics should be given, and the patient's drink should be warm. The *sp. C. C. fucin.* or the *vin. antim.* may be mixed with *bals. traumat.* or with the *bals. Peruv.* and given, at proper distances of time, in the patient's drink, or on a lump of sugar.—Sometimes the serum flows so rapidly to the fauces and adjacent parts, in a salivation, as to deprive the patient of all power to speak; in this case diaphoretics and laxatives, with a forbearance of all mercurials, are the speediest remedies.

#### 473 CXCVIII. MUTITAS, DUMBNESS. Genus CXI.

Mutitas, *Sauv.* gen. 165. *Vog.* 257. *Sag.* 271.

DUMB people are generally born deaf, in which case the distemper is incurable by medicine: though even such people may be taught not only to read and write, but also to speak and to understand what others say to them\*. When it proceeds from a defect of any of the organs necessary for speech, the tongue for instance, it is also incurable; but if it arises from a palsy, the medicines applicable in that case will sometimes restore the speech.

#### 474 CXCI. PARAPHONIA, or Change in the Sound of the Voice. Genus CXII.

Paraphonia, *Sauv.* gen. 168.

Cacophonia, *Sag.* 274.

Raucedo, *Lin.* 146.

Raucitas, *Vog.* 252.

Alaphia, &c. *Vog.* 250, 251, 254, 255, 256.

THE voice may be changed from various causes. In males it becomes much more harsh about the time of puberty; but this can by no means be reckoned a disease. In others it proceeds from a catarrh, or what we call a cold; it arises also from affections of the nose and palate, as polypi, ulcers, &c. in which case the cure belongs properly to SURGERY. In some it arises from a laxity of the *velum pendulum palati*, and *glottis*, which makes a kind of snoring noise during inspiration. The cure of this last case is to be attempted by tonics and such other medicines as are of service in diseases attended with laxity.

#### CC. PSELLISMUS, or DEFECT in PRONUNCIATION. Genus CXIII.

Psellismus, *Sauv.* gen. 167. *Lin.* 138. *Sag.* 273. *Traulot.* &c. *Vog.* 258, 259, 260, 261.

OF this disease (if such it may be called), there are many different kinds. Some cannot pronounce the letter S; others labour under the same difficulty with R, L, M, K, &c.; while some who can with sufficient ease pronounce all the letters, yet repeat their words, or the first syllables of them, in such a strange manner, that they can scarce be understood. Very frequently these defects arise entirely from habit, and may then be got the better of by those who have the resolution to attempt it; as we are told that Demosthenes the celebrated orator got the better of a habit of stammering, by declaiming with pebbles in his mouth. Sometimes, however, pronunciation may be impeded by a wrong conformation of the tongue, or organs of speech; and then it cannot by any pains whatever be totally removed.

#### CCII. STRABISMUS, or SQUINTING. Genus CXIV.

Strabismus, *Sauv.* gen. 116. *Lin.* 304. *Vog.* 514. *Sag.* 222.

**Description.** THIS disease shews itself by an uncommon contraction of the muscles of the eye; whereby the axis of the pupil is drawn towards the nose, temples, forehead, or cheeks, so that the person cannot behold an object directly.

**Causes, Prognosis, &c.** I. This disease may proceed from custom and habit; while in the eye itself, or in its muscles, nothing is preternatural or defective.

THIS children, by imitating those that squint, and infants, by having many agreeable objects presented to them at once, which invite them to turn one eye to one and the other eye to another, do frequently contract a habit of moving their eyes differently, which afterwards they cannot so easily correct. Infants likewise get a custom of squinting, by being placed obliquely towards a candle, window, or any other agreeable object capable of attracting their sight: for though, to see the object, they may at first turn both eyes towards it; yet, because such an oblique situation is painful and laborious, especially to the most distant eye, they soon relax one of the eyes, and content themselves with examining it with the eye that is next it; whence arises a diversity of situation, and a habit of moving the eyes differently.

In this case, which may admit of a cure if not too much confirmed, it is evident, that objects will be seen in the same place by both eyes, and therefore must appear single as to other men; but because, in the eye that squints, the image of the object to which the other eye is directed falls not on the most sensible and delicate part of the retina, which is naturally in the axis of the eye, it is easy to see that it must be but faintly perceived by this eye. Hence it is, that while they are attentive in viewing any object, if the hand be brought before the other eye, this object will be but obscurely seen, till the eye change its situation, and have its axis directed to it; which change of situation is indeed very easy for them, because it depends

**PRACTICE** on the muscles of the eyes, whose functions are entire; but, by reason of the habit they have contracted of moving their eyes differently, the other eye is at the same time frequently turned aside, so that only one at a time is directed to the object.

That all this may be the better perceived; for an object, cause them to look at the image of the upper-part of your nose in a plain mirror, while you stand directly behind them, to observe the direction of their eyes.

II. The *strabismus* may proceed from a fault in the first conformation, by which the most delicate and sensible part of the retina is removed from its natural situation, which is directly opposite to the pupil, and is placed a little to a side of the axis of the eye; which obliges them to turn away the eye from the object they would view, that its picture may fall on this most sensible part of the organ.

When this is the case, the disease is altogether incurable, and the phenomena that arise therefrom differ in nothing from the phenomena of the former case, excepting only that here, 1. The object to which the eye is not directed will be best seen; which is the reverse of what happens when this disease arises barely from habit and custom. 2. No object will appear altogether clear and distinct: for all objects to which the eye is directed, by having their image painted on the retina at the axis of the eye, where it is not very sensible, will be but obscurely seen; and objects that are placed so far to a side of the optic axis as is necessary for making their image fall on the most sensible and delicate part of the retina, must appear a little confused, because the several pencils of rays that come therefrom fall too obliquely on the crystalline to be accurately collected in so many distinct points of the retina; though it must be acknowledged, that this confusion will, for the most part, be so small as to escape unobserved.

III. This disease may proceed from an oblique position of the crystalline, where the rays that come directly to the eye from an object, and that ought to converge to the point of the retina, which is in the axis of the eye, are, by reason of the obliquity of the crystalline, made to converge to another point on that side of the visual axis where the crystalline is most elevated; and therefore the object is but obscurely seen, because its image falls not on the retina at the axis of the eye, where it is most sensible: But the rays that fall obliquely on the eye, will, after refraction, converge to this most sensible part of the retina; and, by converging there, must impress the mind with a clearer idea of the object from whence they came. It is for this reason that the eye never moves uniformly with the other, but turns away from the object it would view, being attentive to the object to which it is not directed. When this is the case, it is in vain to expect any good from medicine.

The symptoms that naturally arise from it are, 1. The object to which the eye is directed will be but faintly seen, because its image falls on the retina where it is not very sensible. 2. The object to which the eye is not directed, by having its image painted on the retina at the axis of the eye, will be clearly perceived. But, 3. This same object must appear

somewhat indistinct, because the pencils of rays that flow from it are not accurately collected in so many distinct points in the retina, by reason of their oblique incidence on the crystalline. And, 4. It must be seen, not in its proper place, but thence translated to some other place situated in the axis of vision. And, 5. Being thus translated from its true place, where it is seen by the other eye that does not squint, it must necessarily appear double; and the distance between the places of its appearance will be still greater, if the crystalline of the other eye incline to the contrary side.

IV. This disease may arise from an oblique position of the cornea; which, in this case, is generally more arched and prominent than what it is naturally.

When the eye has this conformation, no object to which it is directed can be clearly seen, because its image falls not on the retina at the axis of the eye; and therefore the eye turns aside from the object it would view, that its image may fall on the most sensible part of the retina.

When the *strabismus* proceeds from this cause, the prognostic and the phenomena that attend it will be much the same as in the case immediately preceding; from which nevertheless it may be distinguished by the obliquity of the cornea, which is manifest to the senses; and if the cornea be also more arched and prominent than what it is naturally, which is commonly the case, the eye will also be short-sighted.

V. This want of uniformity in the motions of our eyes, may arise from a defect, or any great weakness or imperfection, in the sight of both or either of the eyes; and this, according to Dr Porterfield, is the most common cause of this disease. The prognostic in this case is the same with that of the disease from which it proceeds.

VI. Another cause from which the *strabismus* may proceed, lies in the muscles that move the eye. When any of those muscles are too short or too long, too tense or too lax, or are seized with a spasm or paralysis, their equilibrium will be destroyed, and the eye will be turned towards or from that side where the muscles are faulty.

In this case, the disease frequently yields to medicine, and therefore admits of a favourable prognostic; excepting only when, by a fault in the first conformation, any of the muscles are longer or shorter than their antagonist; in which case, if ever it should happen, no medicine can be of any value.

As to what concerns the optical phenomena, they are the same here as in case first: only when the disease commences not till, by custom and habit, the uniform motion of the eyes has been rendered necessary, all objects do for some time appear double; but in time they appear single.

Lastly, This want of uniformity in the motions of our eyes, may proceed from a preternatural adhesion or attachment to the eye-lids: of this we have an instance in Langius. And that the same thing may also be occasioned by a tumour of any kind within the orbit, pressing the eye aside, and restraining it from following the motions of the other, is so evident, that instances need not be brought to prove it. Here also the case may admit of a favourable prognostic; and

and as for what concerns the optical phenomena, they must be the same as in the case immediately preceding.

**Cure.** This, in confirmed cases, is to be effected by mechanical contrivances, by which the person may be obliged to look straight upon objects, or not see them at all; or at least that he may see with uneasiness and confusedly when he squints. In the 68th volume of the Philosophical Transactions we have an account of a confirmed case of squinting of a very uncommon kind. The patient was a boy of five years old, and viewed every object which was presented to him with but one eye at a time. If the object was presented on his right side, he viewed it with his left eye; and if it was presented on his left side, he viewed it with his right eye. He turned the pupil of that eye which was on the same side with the object in such a direction that the image of the object might fall on that part of the bottom of the eye where the optic nerve enters it. When an object was held directly before him, he turned his head a little to one side, and observed it with but one eye, viz. that most distant from the object, turning away the other in the manner above described; and when he became tired of observing it with that eye, he turned his head the contrary way, and observed it with the other eye alone, with equal facility; but never turned the axis of both eyes on it at the same time. He saw letters which were written on bits of paper, so as to name them with equal ease, and at equal distances, with one eye as with the other. There was no perceptible difference in the diameters of the irises, nor in the contractility of them after having covered his eyes from the light. These observations were carefully made by writing single letters on shreds of paper, and laying wagers with the child that he could not read them when they were presented at certain distances and in certain directions.

As from these circumstances it appeared that there was no defect in either eye, which is frequently the case with persons who squint, and hence that the disease was simply a depraved habit of moving his eyes, the disease seemed capable of a cure. A paper gnomon was made for this purpose, and fixed to a cap; and when this artificial nose was placed over his real nose, so as to project an inch between his eyes, the child rather than turn his head so far to look at oblique objects, immediately began to view them with that eye which was next to them. But, having the misfortune to lose his father soon after this method was begun to be followed, the child was neglected for six years, during which time the habit was confirmed in such a manner as seemed to leave little room to hope for a cure. The same physician, however, being again called, attempted a second time to remove the deformity by a similar contrivance. A gnomon of thin brass was made to stand over his nose, with a half circle of the same metal to go round his temples: these were covered with black silk, and by means of a buckle behind his head, and a cross-piece over the crown of his head, this gnomon was worn without any inconvenience, and projected before his nose about two inches and a half. By the use of this machine he soon found it less inconvenient to view all oblique objects with the eye next to them instead of the eye opposite to them.

After this habit was weakened by a week's use of the gnomon, two bits of wood, about the size of a goose-quill, were blackened all but a quarter of an inch at their summits; these were frequently presented to him to look at, one being held on one side the extremity of his black gnomon, and the other on the other side of it. As he viewed these, they were gradually brought forwards beyond the gnomon, and then one was concealed behind the other: by these means, in another week, he could bend both his eyes on the same object for half a minute together; and by continuing the use of the same machine, he was in a fair way of being cured when the paper was withdrawn.

Dr Darwin, who writes the history of the above case, adds, that all the other squinting people he had occasion to attend, had one eye much less perfect than the other: these patients, says he, are certainly curable by covering the best eye many hours in a day; as by a more frequent use of the weak eye, it not only acquires a habit of turning to the objects which the patient wishes to see, but gains at the same time a more distinct vision; and the better eye at the same time seems to lose somewhat in both these respects, which also facilitates the cure.

## CCII. CONTRACTURA, *Contractions of the* 477 *LIMBS. GENUS CXV:*

*Contractura, Sauv. gen. 119. Lin. 299. Sag. 225.*

*Obticipitas, Sauv. gen. 11.*

*Caput obtipitum, Vog. 513.*

*Digitum, Vog. 221.*

THE contraction of various muscles of the body is generally the consequence of some other disease, as the rheumatism, gout, scurvy, or palsy, especially that species of the latter which follows the *colica Pictonum*. It is exceedingly difficult of cure; though the warm medicinal waters are much recommended, and have sometimes done great service. Of late electricity has been found to perform surprising cures in this way.

## ORDER IV. APOCENOSES.

*Apocenoſes, Vog. Claſs II. Ord. II.*

*Fluxus, Sauv. Claſs IX. Sag. Claſs V.*

*Morbi evacuatorii, Lin. Claſs IX.*

## CCIII. PROFUSIO, or FLUX of BLOOD. 478

*GENUS CXVI.*

*Profuſio, Lin. 239.*

*Hæmorrhagia, Vog. 81. Boerh. 218.*

For the treatment of this genus, see *MENORRHAGIA, HÆMOPHYSES, &c.* above.

## CCIV. EPHIDROSIS, or EXCESSIVE SWEATING. 479

*GENUS CXVII.*

*Ephidroſis, Sauv. gen. 258. Sag. gen. 194.*

*Sudor, Lin. 208.*

*Hydropeſis, Vog. 121.*

THIS is generally symptomatic; and occurs in almost all fevers, but especially in the latter stages of the hectic. Sometimes it is a primary disease, arising merely from weakness; and then easily admits of a cure by the use of the Peruvian bark, the cold bath, and other tonics.



## CCV. EPIPHORA, or FLUX of the LACHRYMAL HUMOUR. GENUS CXVIII.

Epiphora, *Sauv. gen. 259. Lin. 172. Vog. 99. Sag. 195.*

THIS by Sauvages is described as an involuntary effusion of tears without any remarkable itching, heat, or pain. It follows long-continued ophthalmias; or it may be occasioned by immoderate study, or any thing that weakens the eyes: hence it comes on about the age of 50 years, when the eyesight naturally becomes weak. It becomes worse in the winter-time, and is very hard to cure. Some authors recommend purgatives, and blisters on the nape of the neck, in order to draw off the abundant humours; but as the disease evidently proceeds from weakness, it would rather seem proper to pursue a contrary method. Sauvages recommends to the patients to abstain from study, wine, and salted meats; also to avoid smoke or wind, and at night to foment the eyes with an infusion of four cloves in two ounces of proof-spirit. Hungary water, rose water with white vitriol dissolved in it, &c. have also been recommended.

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## CCVI. PTYALISMUS, SALIVATION. GENUS CXIX.

Ptyalismus, *Sauv. gen. 261. Lin. 176. Vog. 103. Sag. 197.*

A salivation is often symptomatic, but rarely a primary disease. Dr Cullen is of opinion, that when the latter happens to be the case, it arises from laxity; and then is to be cured by astringents and tonics. In the Medical Transactions we have the following account of a salivation brought on by a foreign substance irritating one of the parotid glands.

In the month of April 1751, a young lady about the age of 16 years, of a delicate habit, but subject to no particular complaints, perceived the beginning of a disease which afterwards proved most obstinate and loathsome, viz. an incessant spitting. The quantity of this discharge was different at different times, varying from one pint to two pints and an half in 24 hours. As to its quality, it seemed to be no other than the ordinary secretion of the salivary glands. By so large and constant an evacuation, her strength became extremely impaired, and the most efficacious medicines had proved useless. She had taken large quantities of the Peruvian bark, both alone, and combined with preparations of iron: and afterwards the fetid gums, opium, amber, alum, and the Neville-Holt-water, had in succession been given her. In the mean time an exact regimen had been prescribed: she had been ordered to ride constantly; and to confine herself to a mucilaginous diet, such as veal, calves feet, &c. Likewise a gently opening medicine had now and then been interpolated. The disease still continuing unaltered, she had afterwards tried the *tinctura saturnina*; and had, at the same time, been encouraged to chew the Peruvian bark, and to swallow the saliva. But all these attempts had been vain; and after that she had taken some or other of the medicines above-mentioned, until the end of September 1753, namely, above two years, it appeared to her physician (Dr Baker) unreasonable to expect relief in such a case from any internal medicines whatever.

He now conceived a suspicion, that some extraneous body having accidentally found its way into the *meatus auditorius*, might possibly be the cause of this extraordinary secretion, by keeping up a continued irritation in the parotid glands. With this view he examined her ears, and extracted from them a quantity of fetid wool. How, or when, it came thither, no account could be given.

To this substance he attributed the beginning of the salivation, notwithstanding that the disease did not immediately abate on the removal of the wool; as it appeared to be no improbable supposition that the discharge might be continued by the force of habit, tho' the original cause no longer remained.

It seemed therefore expedient to introduce some other habit, in the place of the increased secretion of saliva; which habit might afterwards be gradually left off. With this intention, he prevailed on the patient to chew perpetually a little dry bread, and to swallow it with her spittle. In a few weeks, it became necessary for her to chew the bread only at certain hours in the day; and thus, after two months, she became entirely free from a most disgusting and tedious disorder.

It is worthy of observation, that, at first, the swallowing of so much saliva frequently occasioned a nausea; and that then, for a few hours, she was obliged to spit it out as usual; and that, during the greatest part of the time, when she chewed the bread, she had a stool or two every day more than common.

## CCVII. ENURESIS, an Involuntary FLUX of URINE. GENUS CXX.

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Enuresis, *Sauv. gen. 264. Lin. 195. Vog. 113. Sag. 200.*

THIS is a distemper which frequently affects children, otherwise healthy, when asleep; and is extremely disagreeable. Often it is merely the effect of laziness, and may be driven off by proper correction; but sometimes it proceeds from an atony or weakness of the sphincter of the bladder. Many ridiculous cures have been prescribed for it, and among the rest field-mice dried and powdered. Tonics are frequently of use; but sometimes the distemper proves obstinate, in spite of every thing we can use. In the London Medical Observations we find blisters greatly recommended in this disease, when applied to the region of the os sacrum. A girl of 13 years of age had been subject to an enuresis for four years. She could retain her water but a very little while in the day-time, but it flowed continually in the night. She had taken bark and elixir of vitriol in considerable quantities, also Valerian and the volatile julep, without effect. She was severely threatened, as the physician suspected it might arise from a bad habit; but this producing no effect, a blister was applied to the os sacrum, which in 24 hours totally removed the disease.—A man aged 32, having been seized with an incontinence of urine and palsy of the lower extremities in consequence of taking a quack medicine, was cured of the incontinence of urine in 24 hours by one blister, and of the palsy itself by another. A woman of 50 having been seized with an enuresis and paralytic affection of the right thigh and leg in consequence of a strain, was cured of both

both by a single blister. Several other cafes are there mentioned, by which the power of blisters in removing this distemper seems to exceed that of every other medicine whatever.

483 CCVIII. GONORRHOEA. Genus CXXI.

Gonorrhœa, *Sauv.* gen. 208. *Lin.* 200. *Vog.* 118. *Sag.* 204.

The gonorrhœa is a flux of viscid matter of various colours, from the urethra in men, and the vagina in women. It commonly proceeds from coition with a person infected with the venereal disease, and is the first symptom by which that disease usually shews itself.

*Description.* The first symptoms of the disease in men, are commonly a sensation at the end of the penis not unlike a flea-bite, together with a fulness of the lips of the urethra, and some degree of tension in the penis, the urinary canal feeling as if tightened, and the urine flowing in a small and unequal stream: a little whitish mucus is to be seen about the orifice of the urethra, and oozing from it when slightly pressed, especially if the pressure is made on the spot where the soreness is most felt. The discharge soon increases in quantity, and varies in its colour according to the degree of inflammation. The patient feels a sensation of heat and pain in evacuating his urine, particularly at certain spots of the urethra, and above all towards its orifice; and the involuntary erections to which he is subject from the stimulus, particularly when warm in bed, occasion a distortion or curvature of the penis, attended with exquisite pain. When the inflammation is violent, the glands appear tumid and transparent, the tension extends through the whole of the penis, the perinæum is affected with swelling and redness, and even the loins, buttocks, and anus, sympathize and afford a very uneasy sensation. Sometimes the prepuce inflames about the end of the penis, and cannot be drawn back, occasioning what is called a *phymosis*; at others, as in the *paraphymosis*, it remains in an inflamed state below the glands, so that it cannot be drawn forwards; and, if the stricture and inflammation are violent, may terminate in gangrene. Now and then, especially when there is a phymosis, we may perceive a hard chord extending along the back of the penis. This is an inflamed lymphatic, and may be considered as a prelude to a bubo.

In mild cases, the seat of the disease is in the urethra, not far from its orifice; but it frequently happens that the virus insinuates itself much higher up, so as to affect Cowper's glands, the prostate, and parts very near to the neck of the bladder.

In the generality of cases, the inflammation goes on increasing for several days, commonly for a week or a fortnight; after which the symptoms begin to abate; and the running, when left to itself, gradually lessens in quantity, and becomes whiter and thicker, till at length it totally stops. The colour of the mucus, however, is by no means a certain guide in these cases: for in many patients it is of a yellowish, and sometimes of a greenish hue to the very last; but in general it becomes more consistent towards the close of the disease.

In women, the parts of generation being fewer and more simple, the disease is less complicated than in

men. Sometimes the vagina only is affected; and when this happens, the symptoms are very trifling: but in general it comes on with an itching and sensation of heat as in the other sex; and is attended with inflammation of the nymphæ, inside of the *labiæ, clitoris, caruncula myrtiformes*, the orifice and sometimes the whole of the *meatus urinarius*. Very often the deep-seated glands of the vagina are affected, and it is sometimes difficult to distinguish the discharge of a gonorrhœa from that of the fluor albus.

*Causes, &c.* Many ingenious arguments have of late been advanced to prove, that the gonorrhœa and the lues venerea are different affections, originating from two distinct species of virus. It would be happy for mankind if this opinion were well founded; but, unfortunately, every day's experience shews it to be erroneous. It has been proved, that the matter of a chancre introduced into the urethra will generate a gonorrhœa; and that the discharge of a gonorrhœa will produce a chancre, bubo, and lues.

The matter of a gonorrhœa itself, when absorbed into the patient's own body, will also produce a lues; but in order for it to do this, it is perhaps necessary (though this is by no means certain) that it should be taken up from an ulcerated surface; and there are many practitioners, of no inconsiderable eminence, who deny that any such ulceration is ever produced in the urethra by a gonorrhœa. They contend that the increased secretion in these cases is exactly similar to what happens in the catarrh. But the comparison will by no means hold good: in the latter the whole membrane of the nose is equally irritated; whereas in the gonorrhœa, only particular parts of the urethra seem to be affected. The disease, in the generality of cases, seldom extends more than an inch and a half along that canal, and in many is confined (at least in the beginning) to a small spot about an inch from the extremity of the glands. The discharge is produced from that part of the urethra where the pain is felt; and the patient, when he voids his urine, feels no smarting till it reaches the inflamed spot, but as the disorder increases, the inflammation affects a greater number of points, just in the same manner as chancres affect different parts of the glands. It might be supposed that dissection would at once clear up this matter, and put an end to the dispute; but this is far from being the case. Dr Simmons has seen several urethras opened in persons who had a gonorrhœa at the time of their death: in three of them the surface of the urethra, as in the cases related by Morgagni, appeared for some way down of a slight red colour, and in all of them was covered with mucus; but without any appearance of ulceration, except in two dissections at Paris, in which most of the gentlemen present were convinced that they saw evident marks of it; but Dr Simmons says that the appearances were to him not sufficiently satisfactory to enable him to decide with certainty on the subject. On the other hand, when we consider that the discharge in a gonorrhœa is sometimes tinged with blood, and that when this happens a little blood-vessel is no doubt ruptured, we can have no reason to doubt that an ulceration may, and sometimes does, happen in these cases; especially as we often observe an excoriation near the orifice of the urethra. It is certain, that wherever there is con-

considerable inflammation, there will be danger of ulceration. Besides, from a neglected or badly-treated gonorrhœa, we often see fistulas in *perineo*, and other ulcers of the urethra penetrating through its substance, and affording a passage to the urine. And there can be no doubt that slight ulcerations of this canal often occur, and are afterwards perfectly obliterated, in a similar manner to what happens in the papillæ of the tongue, the tonsils, &c. Such an obliteration will the more readily take place in a part like the urethra, defended with mucus, and not exposed to the air, which is known to have no little effect in hardening a cicatrix.

Perhaps, all things considered, the most rational idea we can form of the causes and phenomena of this disease, will be, that particles of the venereal virus being blended with the semen, and with the mucus that oozes from the urethra, during coition, may be drawn up a certain way into that canal, where the irritation they occasion will be in proportion to the virulence of the infecting matter, and the irritability, habit of body, &c. of the patient. The consequences of this irritation will be inflammation and an increased secretion of mucus, and so far the complaint will be local. But now and then it will happen, as in other inflammations, that ulceration will take place, and expose the patient to the danger of a constitutional infection. Nay, we are not certain but this may happen without ulceration. Drastic purges are known to be great promoters of absorption, and some instances of lues venerea have been met with which seemed to be owing to the imprudent use of such remedies in a previous gonorrhœa.

Nothing can be more variable than the period at which the disease makes its appearance after infection. Perhaps, at a medium, we may place it between the 4th and 14th day: but in some cases it happens within 24 hours; and in others, not before the end of five, or even six weeks: neither of these extremes, however, are common.

*Cure.* From the foregoing description of the progress of the disease, it will easily be perceived that the chief curative indications are to subdue the inflammation, and remove the virus that occasions it.

There are practitioners who, supposing that the body possesses powers to expel the virus, and that the disease has a certain period to run through its several stages of progress, acme, and decline, are for leaving the cure to nature; or at least content themselves with assisting her by an antiphlogistic regimen, gentle evacuations, and the like.

That in many cases the disorder admits of a natural cure, there can be no doubt; the increased secretion of mucus carrying off the virus faster than it is formed, till at length the infection is wholly removed. But it is equally certain, that in every case, by the application of suitable remedies to the inflamed part, we may shorten the duration of the complaint, and abridge the sufferings of the patient, with the same certainty and safety as we are enabled to remove the effects of an ophthalmia, or any other local inflammation, by proper topical applications. General remedies, such as occasional blood-letting, a cooling diet, the liberal use of diluting liquors, and mild purges, are by all allowed to be useful and even necessary. Astruc was of opi-

nion that in these cases blood-letting ought to be repeated five or six times; and there are still many practitioners who depend much on repeated evacuations of this sort for a removal of the inflammation. But there is, perhaps, not one case in ten in which it is at all requisite; and this small number of cases will conflict only of the strong and plethoric: in such, when the chordee is frequent and painful, and the pulse hard and full, the loss of from eight to twelve ounces of blood will be beneficial, but it will be seldom necessary to repeat the operation. The inflammation in these cases is kept up by the local stimulus of the virus and the urine; and all that we can expect from venesection is to moderate the pain and the frequency of erection. In persons of a delicate habit, and of an irritable fibre, the evacuation will do no good; but, if repeated, will certainly be liable to do harm, by increasing irritability, and of course rendering the patient more susceptible of stimulus.

The utility, and even the necessity of a cooling regimen are sufficiently obvious; wine and spirituous liquors, spiceries, a fish-diet, much animal-food, and salted and high-seasoned dishes of every sort, will constantly add to the complaint. The patient should eat meat only once a-day, and that sparingly. He should abstain from hot suppers. Milk, mild vegetables, and fruit, should constitute the principal part of his diet while the inflammatory symptoms continue. Every thing that tends to excite the venereal imagination should be studiously avoided; for whatever promotes erections of the penis will increase the inflammation, and of course add fuel to the disease. For the same reasons much walking or riding on horseback will be hurtful, from the irritation kept up in the perineum by such means. Violent exercise of any kind, or any thing that is liable to increase the heat and momentum of the blood, will of course be improper.

The drinking freely of mild, cooling, mucilaginous liquors, such as linseed-tea, orgeat, whey, milk and water, almond emulsion, and the like, will be extremely useful, by diluting the urine, and preventing its salts from stimulating the urethra. When the heat and pain in making water are very considerable, mucilaginous substances are found to have the best effect, particularly the gum tragacanth. It is a common practice to give equal doses of this gum or gum-arabic, and nitre, and to dissolve nitre in the patient's drink, with a view to lessen the inflammation. But in these cases nitre is always improper: it is known to be a powerful diuretic, its chief action being upon the urinary passages; so that the stimulus it occasions will only serve to increase the evil it is intended to alleviate. Cream of tartar, on account of its diuretic quality, will be equally improper. Our view here is not to promote a preternatural flow of urine; for the virus, being insoluble in water, cannot be washed away by such means: but our object ought to be, to render the urine that is secreted as mild and as little stimulating as possible.

Mild purges, which constitute another material part of the general remedies, are no doubt extremely useful when exhibited with prudence; but it is well known that the abuse of purgative medicines in this disease has been productive of numerous evils. Formerly it was a pretty general practice to give a large dose of calomel



at bed-time, three or four times a-week; and to work it off the next morning, with a strong dose of the *pilule coccie*, or some other drastic purge. This method was persevered in for several weeks: and as the constant effect of a violent drastic purge is to promote absorption from every cavity, the venereal virus was frequently carried into the system, and produced a confirmed lues; or, if the patient escaped this evil, he at least found himself troubled with an obdurate gleet, and, perhaps, his constitution materially injured: the effect of such a method being (especially in irritable habits) to weaken the stomach and bowels, and lay the foundation of hypochondriac complaints. Violent purging likewise often occasions strangury, hernia humoralis, and other troublesome symptoms. Now that we are well acquainted with the doctrine of absorption, this absurd practice is very deservedly fallen into disrepute; for surely no man, who is conversant with anatomy, will, at this time of day, attempt to discharge the virus of a gonorrhoea by stool, when he knows that it must first be taken up by the lymphatics, and carried into the circulation: and yet, strange as it may seem, such is our attachment to old customs, that we still every now and then meet with cases in which this pernicious method has been adopted.

The purges employed in these cases should be gentle; such as Rochelle salt, manna, tartar. solub. and the like. They should be given only in a dose sufficient to procure two or three stools, and be repeated only every two or three days. The daily use of the purgative electuaries that are still given by some practitioners, serves only to keep up a continual irritation on the bladder, and of course to prolong the inflammation.

The topical remedies that are used consist chiefly of different sorts of injections, the ingredients of which are extremely various; but their modes of operation may in general be referred to their mucilaginous and sedative, or to their detergent, stimulating, and astringent qualities. In the hands of skilful practitioners, great advantages may doubtless be derived from the use of these remedies; but, on the other hand, the improper and unseasonable administration of them may prove a source of irreparable mischief to the patient.

We know that mucilaginous and oily injections will tend to allay the local inflammation; and that a sedative injection, such as a solution of opium, will lessen the irritability of the parts, and of course produce a similar effect: the utility of such applications is therefore sufficiently obvious.

A detergent injection, or one that will act upon the mucus of the urethra, increase the discharge of it, wash it away, and with it the venereal virus that is blended with it, can only be used as a prophylactic before the symptoms of infection have made their appearance. A solution of caustic, properly diluted, will answer this purpose. But great circumspection is necessary in the use of this kind of injection. If it be too weak, it can be of no efficacy; and if it be too strong, it may prove dangerous to the patient. A suppression of urine hath been brought on by the improper use of an injection of this kind. When the symptoms of inflammation have once made their appearance, the stimulus

of such an injection must be extremely hazardous. Excitation of the urethra has but too often been produced by remedies of this sort in the hands of adventurous and unskilful practitioners.

While the inflammation of the urethra continues, every thing that stimulates it must be hurtful. If the injection excites a painful sensation in the urethra, as is but too often the case, it will be liable to produce swelled testicles, difficulty in making water, excoriation, and other effects of increased inflammation: if, by its astringency, the running is checked before the virus that excited the discharge is properly subdued, the patient will be exposed to all the dangers of a confirmed lues; and, perhaps, to a variety of local complaints, such as obstructions in the urethra, and abscesses in *perinæ*, which are well known to be sometimes owing to applications of this sort improperly managed.

When the inflammation has subsided, gently stimulating and astringent injections may be used with safety, and with considerable advantage: for as the inflammation is at first excited by the stimulus of the venereal virus, so when the former begins to lessen, we may be assured that the activity of the latter has abated in proportion; and, in general, when the inflammatory symptoms are entirely removed, it will be found that the mucus is no longer of an infectious nature, but is merely the effect of an increased secretion, and of relaxation. Mild astringents will therefore serve to brace and strengthen the vessels secreting mucus, and in this way will lessen the discharge, and greatly promote the cure. It is certain, that in the greater number of cases, a gonorrhoea, which if treated by internal remedies alone would continue for five or six weeks, or longer, may, when judiciously treated with injections, be cured in a fortnight, and very often in less time. The great aim, therefore, of the practitioner ought to be at first to make use of such injections only as will tend to lubricate the surface of the urethra, and to counteract and destroy the stimulus of the virus: as the inflammation abates, he may add some gently astringent preparation to a mucilaginous and sedative injection; taking care that its astringency be suited to the state of the disease, and to the irritability of the patient. Amongst a great variety of substances, mercury in different forms is one of those that is the most frequently employed in injections. All these mercurial injections have more or less of astringency; and, according to Dr Simmons, it is solely to this property that we are to ascribe their effects; for the idea of their correcting the venereal virus was originally introduced, and has been continued upon mistaken principles.

Calomel, mixed with the mucus discharged in a gonorrhoea, has no more power in destroying the infectious properties of that mucus than ceruse or any other preparation would have. A diluted solution of sublimate injected into the urethra will, like a solution of verdigrise, or blue vitriol, or any other styptic, constringe the mouths of the lacunæ; but this is all that it will do, for it will never lessen the infectious nature of the virus. The same thing may be observed of crude mercury extinguished by means of mucilage, or of mercurial unction, blended with the yolk of an egg, and which, when thrown up into the urethra, will act nearly in the same manner as balsam of copaiva,

or any other stimulating injection. For the truth is, that mercury has no power over the venereal virus, until it has been introduced into the body, and undergone certain changes, with which we are, and probably shall for ever remain, unacquainted: The local application of mercury can therefore have no other effects than what it derives from its stimulating and astringent properties: for the mercury not being absorbed in the urethra, of course cannot be carried into the system; and even if it could, the quantity that would be introduced in this way would be too minute to be of any efficacy. The stimulus of calomel, however, has often been found of considerable efficacy; and in women, when the vagina only was affected, after washing the parts well, the cure hath been accomplished by rubbing them repeatedly with mercurial ointment.

As the gonorrhœa is often a local affection, it may be imagined, perhaps, that the internal use of mercury is unnecessary towards the cure. Very often indeed this complaint may be removed without having recourse to mercurials. Sometimes patients have been met with whose general health has been greatly impaired by a long continued use of mercury in such cases, while the original disease, the gonorrhœa, was rendered much worse by it. In some it degenerated into a gleet, that was cured with extreme difficulty; in others it brought on a variety of distressing symptoms. In cases of gonorrhœa, therefore, whenever mercury is administered, it ought not to be with a view to expedite the cure, but merely to obviate the dangers of absorption. When the infection is apparently slight, and the inflammation and the symptoms trifling, we may proceed without the assistance of mercury, especially if the patient is of a weak, relaxed, and irritable habit, likely to be injured by mercurial medicines. On the other hand, whenever the discharge is violent, the inflammation considerable, or the seat of the disease high up in the urethra, it is advisable to give mercurials in small doses, and in such forms as seem the best adapted to the constitution of the patient.

The mercurial pill of the London Dispensatory, on account of the turpentine that enters into its composition, will sometimes pass through the body undissolved, and of course can then be of no use; but when the mercury is extinguished by means of honey, and made into pills, in the manner directed in the last edition of the Edinburgh pharmacopœia, it becomes as mild and perhaps as efficacious a preparation as any. Its efficacy will depend on its not irritating the bowels, and so passing off by stool; care must likewise be taken to prevent its affecting the mouth. Of the chemical preparations of mercury the mildest and least irritating is calomel. It may be given from gr. iſs. to gr. iiii. at bed-time, occasionally interposing a mild purgative to prevent it from salivating; but in general the mercurial pill just mentioned is to be preferred.

When there is no chancre or bubo, no appearance, in short, that the infection is likely to be carried into the system, it would be improper to administer corrosive sublimate, the mercurius calcinatus, or any other of the more acrid preparations of mercury.

After a gonorrhœa proceeding from venereal causes

hath been removed, another kind of running without pain, called the *gonorrhœa mucosa*, or *gleet*, sometimes remains. Sometimes it arises from a constriction and excoriation of the urethra, and frequently it is the effect of an enlargement and diseased state of the prostate. In each of these cases, as the gleet is the effect of irritation, the cure will depend on the removal of the local disease that occasions it. But there is another species of gleet that seems to depend chiefly on relaxation. It is in general free from infection, and is most common in those who have had long and frequent gonorrhœas. It is likewise often the effect of a debilitated habit, from severe purging, or a long continued use of mercurials. A discharge of this kind is more frequent in women than in men; or, at least, the fluor albus, after a gonorrhœa, will often be mistaken for a gleet.

When there is no reason to suspect a venereal taint, astringent injections will be of the greatest service. It will be necessary, at the same time, to attend to the health of the patient, by giving the bark, chalybeate waters, cold bathing, and such other remedies as will tend to strengthen the system. When there is no tendency to inflammation, the balsam of copaiba may be prescribed with advantage in large doses. Dr Simmons says he once saw a complaint of this sort removed by applying a blister to the perineum, after it had resisted a variety of other remedies. In the Medical Observations also we have an account of a gleet and incontinence of urine removed at once by a blister to the os sacrum. In general, however, the other methods abovementioned will be sufficient to remove it, though sometimes it will continue for a long time in spite of all our endeavours to check it.—Other kinds of gonorrhœa, in which the semen itself is ejected, especially during sleep, may be cured by tonics, and a mild cooling regimen.

## ORDER V. EPISCHESES.

### CCIX. OBSTIPATIO; COSTIVENESS. Genus CXXII.

Obstipatio, *Lin.* 166. *Vog.* 128. *Sag.* 221.

COSTIVENESS is sometimes occasioned by debility in dyspeptic persons, sometimes it is the effect of rigidity, and sometimes it is symptomatic of the colic. It may proceed from an excessive heat of the liver; drinking rough red wines, or other astringent liquors; too much exercise, especially on horseback: it may likewise proceed from a long use of cold insipid food, which does not sufficiently stimulate the intestines. Sometimes it is owing to the bile not descending to the intestines, as in the jaundice; and at other times it proceeds from diseases of the intestines themselves, as a palsy, spasms, tumors, a cold dry state of the intestines, &c.

Excessive costiveness is apt to occasion pains of the head, vomiting, colics, and other complaints of the bowels. It is peculiarly hurtful to hypochondriac and hysterical persons, as it generates wind and other grievous symptoms.

Persons who are generally costive should live upon a moistening and laxative diet; as roasted or boiled apples, pears, stewed prunes, raisins, gruels with  
currents,

currants, butter, honey, sugar, and such like. Broths with spinach, leeks, and other soft pot herbs, are likewise proper. Rye-bread, or that which is made of a mixture of wheat and rye together, ought to be eat. No person troubled with costiveness should eat white bread alone, especially that which is made of fine flower. The best bread for keeping the belly soluble is what in some parts of England they call *mellin*. It is made of a mixture of wheat and rye, and is very agreeable to those who are accustomed to it.

Costiveness is increased by keeping the body too warm, and by every thing that promotes the perspiration; as wearing flannel, lying too long a-bed, &c. Intense thought, and a sedentary life, are likewise hurtful. All the secretions and excretions are promoted by moderate exercise without doors, and by a gay, cheerful, sprightly temper of mind.

The drink should be of an opening quality. All ardent spirits, aultere and astringent wines, as port, claret, &c. ought to be avoided. Malt-liquor that is fine and of a moderate strength, is very proper. Butter-milk, whey, and other watery liquors, are likewise proper, and may be drank in turns, as the patient's inclination directs.

Those who are troubled with costiveness ought, if possible, to remedy it by diet, as the constant use of medicines for that purpose is attended with many inconveniences, and often with bad consequences. In time the custom becomes necessary, and generally ends in a total relaxation of the bowels, indigestion, loss of appetite, wasting of the strength, and death.

The learned Dr Arbuthnot advises those who are troubled with costives to use animal-oils, as fresh-butter, cream, marrow, fat broths, especially those made of the internal parts of animals, as the liver, heart, midriff, &c. He likewise recommends the expressed oils of mild vegetables, as olives, almonds, pistaches, and the fruits themselves; all oily and mild fruits, as figs; decoctions of mealy vegetables; these lubricate the intestines; some saponaceous substances which stimulate gently, as honey, hydromel, or boiled honey and water, unrefined sugar, &c.

The doctor observes, that such lenitive substances are proper for persons of dry atrabiliar constitutions, who are subject to attraction of the belly and the piles, and will operate when stronger medicinal substances are sometimes ineffectual; but that such lenitive diet hurts those whose bowels are weak and lax. He likewise observes, that all watery substances are lenitive; and that even common water, whey, four milk, and butter-milk, have that effect:—That new milk, especially asses milk, stimulates still more when it fours on the stomach; and that whey, turned four, will purge strongly:—That most garden-fruits are likewise laxative; and that some of them, as grapes, will throw such as take them immediately, into a cholera morbus, or incurable diarrhoea.

When the body cannot be kept open without medicine, gentle doses of rhubarb may be taken twice or thrice a-week. This is not near so injurious to the stomach as aloes, jalap, or the other drastic purgatives so much in use. Infusions of fenna and manna may likewise be taken, or half an ounce of soluble tartar dissolved in water-gruel. About the size of a nut-

meg of lenitive electuary taken twice or thrice a-day, generally answers the purpose very well.

### CCX. ISCHURIA, or SUPPRESSION of Urine. 485

Genus CXXIII.

*Ischuria*, Sauv. gen. 293. *Lin.* 167. *Vog.* 129. *Sag.* 212. *Home's* Clinical experiments, sect. xv.

This distemper is distinguished into various species, according as the seat of it is in the kidneys, the ureters, the bladder, or the urethra; and hence these species are named *renalis*, *ureterica*, *vesicalis*, and *urethralis*.

1. *Ischuria renalis*, or a suppression of urine from an affection of the kidneys, happens but rarely; however, Dr Home in his Clinical Experiment describes such a case. In the end of December 1774, a man of a full habit, aged 35, was seized with shivering, coldness, and severe cough. Three days after, his urine appeared high-coloured, was passed with pain, and in small quantity. About the 8th of January 1775, he was attacked with violent pains in the small of his back, over the whole abdomen, and in the ankles, with pain in the region of the liver when pressed. A general swelling was afterwards observed all over the body, but mostly in the ankles and abdomen, which last was tense and hard. These were attended with vomiting, bad appetite, and considerable thirst. When he entered the clinical ward, (January 21st), the cough, sickness, and vomiting, had gone off, but the suppression of urine remained. The little which he made was passed with his stools, so that Dr Home saw it but once; and then it was pale, and had a white powder at bottom. The pains and swellings, which retained the impression of the finger, continued; he had a head-ach, and a very slow pulse, beating only 48 strokes in a minute. He had taken a great many diuretic medicines before he came in. The day after his reception, he was seized with a spontaneous diarrhoea, which continued during the remainder of his life. Cream of Tartar was exhibited in doses of half an ounce each morning; at bed-time he took 20 drops of laudanum with a scruple of nitre, and continued this course for eight days without any increase of urine. The stronger and heating diuretics were then tried, as *Infus. bacc. junip.* and *Pilul. ex allio*; but they were attended with no sensible advantage. Whenever the pulse became so strong that he could bear bleeding, eight ounces of blood were taken away, and which was fizy. This was thrice repeated; he appeared easier after each bleeding, his pulse bore it well, and the swellings and other symptoms abated. The heating diuretics, in this state, were given up; and a mixture of vinegar and nitre was substituted in their place, in each dose of which, taken every two hours, there was a scruple of nitre. Fomentations were applied to the region of the kidneys, and camphorated oil was afterwards rubbed on the part. He was ordered the semicupium, which from a deficiency of water in the town he got only once; and which then seemed to have a good effect, as he passed a gill of urine when he was in it. Notwithstanding this, however, the disease continually gained ground; he became comatose, delirious, and died ten days after his admission.—On dissection, the kidneys were found of an irregular form; some watery vesicles appeared on their surface, containing black gritty



gritty particles like fine sand; and the lower part of the right kidney was considerably inflamed. The pylorus, part of the duodenum, and a considerable part of the small intestines were much inflamed. In the abdomen were found about five pounds of fluid, and in the cavities of the thorax about half a pound. The lungs were a little inflamed, and full of small tubercles on their surface and in their substance: the heart was large, and a polypos in each ventricle. About six ounces of fluid were found in the pericardium: in the brain nothing preternatural appeared, except about an ounce of water in each ventricle.

Dr Home seems to have been at a loss for the remote cause of this suppression of urine, which manifestly had its immediate origin from the kidneys having lost the power of performing their functions. He thinks the inflammation which appeared in the right kidney was scarce sufficient to have occasioned the distemper, as the other would have supplied its place: for which reason also he thinks that the ischuria was owing to a general affection of the system; and that it was of an arthritic nature, the patient having been troubled with complaints of this kind for a long time before.

2. The *ischuria ureterica* is also a rare disease, unless the obstruction proceeds from a stone or clot of blood stopping up the passage. Gravel or stones, indeed, are very frequently formed in the kidneys; and, by falling into the ureters, occasion an ischuria, with violent pain, and symptoms more or less urgent in proportion to the size and shape of the stones. Sometimes it is attended with coldness of the extremities, nausea and vomiting, and spastic constriction of the præcordia, a difficulty of making water, constipation of the belly, difficulty of breathing, stupor of the thigh, retraction of the testicle to the *os pubis*, inquietude, loss of strength, syncope, and convulsions. When the violent pain has continued for several days and nights without intermission, and has brought the patient exceeding low, and the suppression of urine is complete, with coldness of the extremities and convulsions of the tendons, death is at hand. Nor is it a good sign when the stone continues long in the ureter; for then the appetite decays, a nausea and retching to vomit supervene, and the patient is consumed with a hectic heat. Sometimes the pain is attended with an inflammation of the stomach and intestines; and sometimes the disease ends in a dropsy of the breast, or lethargy, which soon carry off the patient.

The indications of cure are, to exclude the stone as easily as possible, and prevent the breeding of others. If the patient is of a sanguineous temperament, Sydenham recommends to take away ten ounces of blood from the affected side; and then to give the patient a gallon of posset-drink in which two ounces of marsh-mallow roots have been boiled, injecting at the same time an emollient clyster. After the posset-drink has been vomited up, and the clyster returned, give a pretty large dose of an opiate. But if the patient is old or weak, or subject to the vapours, bleeding may be omitted, especially if his urine at the beginning of the fit is coffee-coloured, and mixed with gravel; but as to other things, the cure is the same.—Huxham greatly recommends an emollient bath prepared of a

decoction of marsh-mallow root, linseed, sænugreek seed, and flowers of chamomile, to which may be added a few white-poppy seeds. By the use of this bath he says he has seen the most cruel fit of the gravel suddenly ended, when neither copious bleeding nor opiates had the least effect. Mild diuretics are also of service. Hoffman recommends dulcified spirit of nitre as proper to relax the spastic stricture. It is to be taken with suitable distilled waters, and syrup of poppies; or in broth, with a few spoonfuls of oil of sweet almonds. Turpentine glysters are also accounted very serviceable; and may be prepared of ten ounces decoction of chamomile, with half an ounce of turpentine dissolved in the yolk of an egg, with as much honey. The *sal diureticus*, or *terra foliata tartari*, is much esteemed by some, when taken along with an opiate. But when the ischuria is too big to pass, Arbuthnot recommends a cool and diluent diet to hinder the further growth of it. Whey, linseed, decoction of marshmallows, and gently resolving diuretics, are also proper. To put a stop to the vomiting, *balsamum traumaticum* may be used with success when almost every other means have failed.

3. The *ischuria vesicalis* may arise from a stone in the bladder; and this indeed is the most common cause of it: but there are certain cases in which, though the usual quantity of urine, or perhaps more, is passed, the patient dies from the retention of a still greater quantity in the bladder. Of this Dr Home gives the following instances. A man of 68 years of age, of a strong spare habit, and never subject to the gravel, had, during the winter of 1777, a cough with expectoration, which went off in the beginning 1778. About the 17th of February 1778 he felt some difficulty in passing his urine, and much pain about the region of the bladder. He continued in this way for ten days, after which he became easier on application of some medicines. The abdomen then swelled, and he had pains in his loins and thighs. On the 3d of March he was admitted into the clinical ward: his abdomen was then swelled and tense; and an evident fluctuation was felt, which some that touched him thought was sonorous and produced by wind. A tumour was discovered betwixt the navel and spine of the os ilium on the left side, which gave him much pain, especially when pressed. This tumour became more easily felt after the swelling of the abdomen decreased, seemed round, and very near as large as the head of a child. It appeared very much on the left side, even when the patient lay on the right, and the tumour then became dependent. He passed urine frequently, and rather more than in health, as it was computed at four pints a-day. It was always clear, and of a light colour. His body had a strong disagreeable smell; his skin was dry, belly bound, and his appetite entirely gone, so that he had hardly taken any food for 12 days. His legs swelled slightly for some days in the evening. His pulse was generally regular, sometimes slower than natural, and sometimes a little quicker; being once felt at 64, and another time at 92. He was often seized, especially after eating or drinking, with hiccups, which increased and lasted till his death. On the 20th day of his disease, after some doses of squills, the general swelling of his abdomen fell, became much softer and

more

more distinctly discovered the swelling of the left side. The next day a vomiting came on; he became more delirious, and died the day following. The body being opened, it appeared that the tumour which was so distinctly felt in the left side of the abdomen, was owing to a distention of the bladder with urine. Its fundus reached to about the division of the aorta into the iliacs; it entirely filled the pelvis, and contained between five and six pounds of urine of a pale colour. On examining the external surface, its neck, and the beginning of the urethra, were found to be surrounded with a scirrhus, which impeded the evacuation of the urine. The bladder itself was much thickened, but not more in one part than another. The ureters entered naturally; but were much thickened in their upper half near the kidney. The kidneys were somewhat enlarged; particularly the left, which had several watery vesicles on its external surface. These organs were not in their usual situation; but lay close on each side of the spine, and very near the aorta; so that the renal vessels were very short. What was very singular, the lower end of each rose over the spine, and they were united together by their membranes and substances, the aorta passing beneath the union. The bladder had pressed considerably on this part; and the peritoneum covering them was considerably thicker than natural. The lungs adhered every-where to the pleura, and in some places very firmly; they were of a loose texture and black colour; and the veins of the lower extremities were turgid with blood. It doth not appear that this patient got any medicines farther than a few dried squills, which diminished the swellings and brought off much wind. He also got a mixture of mulek and afterwards of opium for his hiccup, but without success. His disease was mistaken for an ascites; and the catheter was not tried: but in another case the use of this instrument was apparently of more service than any internal medicines. This last patient was about 60 years of age, and laboured under symptoms very similar to those already mentioned. When admitted into the clinical ward, he had the hypogastric region swelled, and difficulty of passing his water; but without pain, vomiting, or hiccup. He had lost all appetite; was thirsty, and costive. His pulse was 110, and weak. In the evening about three English pints of pale clear urine were drawn off by means of the catheter: the next day all the symptoms were gone off or abated. After this he continued to pass some urine, sometimes voluntarily, sometimes involuntarily and insensibly; but so much always remained behind, that his bladder was constantly full, unless when the urine was drawn off, which was done twice every day. The urine was sometimes pale, sometimes of a deep red colour; and once there was some blood mixed with it, which perhaps might have been occasioned by the catheter. About the sixth day the urine was very putrid, with much purulent-like matter at the bottom, and was passed with more pain. About the 11th, the putrid smell went off. The next day all the urine passed insensibly except what was drawn off; and an hiccup, though not very severe, had come on. In this way he continued without fever, though frequently troubled with the hiccup, especially during those nights in which the urine had not been drawn off. A month after ad-

mittance, the bladder, with the assistance of the catheter, was almost entirely, though insensibly evacuated, and the hiccup had left him; he had no other complaint but that of voiding his urine insensibly, the natural effect of a scirrhus bladder, and which was probably incurable. With this patient the hot bath and mercurials were tried, in order to lessen the scirrhus of the bladder, but without effect.

4. The *ischuria urethralis* arises from some tumour stopping up the passage of the urethra, and thus hindering the flow of urine. It is an uncommon distemper, and generally follows a gonorrhoea. Dr Home gives us an example of this also.—The patient was a man of 60 years of age, who had laboured under a gonorrhoea six months before, and which was stopped by some medicines in two or three days. He felt, soon afterwards, a difficulty in passing his urine, which gradually increased. About 10 days before his admission into the clinical ward, it was attended with pains in the glands, and *ardor urinae*; he had passed only about eight ounces the day before his admission, and that with very great difficulty; and the hypogastric region was swelled and pained. On introducing the catheter, three pounds of urine were drawn off, by which the pain and swelling were removed. The instrument required force to make it pass the neck of the bladder, and blood followed the operation; and the finger, introduced into the anus, felt a hard tumour about its neck. He was treated with mercurial pills and ointment, by which the swelling about the neck of the bladder soon began to decrease; but at the same time a swelling of the right testicle appeared. He was vomited with four grains of turbit-h-mineral, which operated gently; and here Dr Home observes, that, though these vomits are little used, from a mistaken notion of their severity, he never saw them operate with more violence than other vomits, or than he could have wished. The swelling diminished in consequence of the vomit and some external applications; and the cure was completed by bleeding, and a decoction of mezereon-root.

#### CCXII. DYSURIA, or DIFFICULTY of MAKING WATER. Genus CXXIV.

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*Dysuria, Sauv. gen. 265. Lin. 57. Vog. 164. Sag. 213.*

*Stranguria auctorum.*

A DIFFICULTY of making water may arise from many different causes; as from some acrid matter in the blood, cantharides, for instance: and hence a strangury very often succeeds the application of blisters. In many cases it arises from a compulsion of some of the neighbouring parts; of the uterus, for instance, in a state of pregnancy. Or it may arise from a spasmodic affection of the bladder, or rather its sphincter; or from an inflammation of these parts, or others near them. Hence the disease is distinguished into so many species, the cure of which depends upon the remedies indicated by their different causes.

But the most common, as well as the most dangerous species is that arising from a calculous concretion, or

#### STONE in the BLADDER.

*Dysuria calculosa, Sauv. sp. 12.*

The signs of a stone in the bladder are, Pain, especially

cially about the sphincter; and bloody urine, in consequence of riding or being jolted in a carriage; a sense of weight in the *perinaeum*; an itching of the *glans penis*; slimy sediment in the urine; and frequent stoppages in making water; a *tenesmus* also comes on while the urine is discharged: but the most certain sign is, when the stone is felt by the finger introduced into the *apex*, or by the catheter.

*Causes, &c.* It is not easy to say what the particular causes are that occasion the earthy particles of the fluids to run together, and form those calculous concretions which are found in different parts of the body, and especially in the organs for straining off and discharging the urine.

The gout and stone are generally supposed to have some affinity, because gouty people are for the most part afflicted with the gravel. But perhaps this is chiefly owing to their long confinement, and to the lying on the back, which people who labour under the gout are often obliged to submit to; since the want of exercise, and this posture, will naturally favour the stagnation of gross matters in the kidneys: besides, there are many instances of people severely afflicted with the stone for the greatest part of a long life, who have never had the least attack of the gout.

Whatever may be the particular cause of the disposition to *lithiasis*, the kidneys appear to be the most likely places for the earthy particles to concrete or run together, because of the great quantity of blood which passes through the renal arteries, and which comes immediately from the heart, fraught with various newly-received matters, that have not undergone much of the action of the vessels, and therefore cannot as yet be supposed to be thoroughly assimilated.

Anatomists who have carefully examined the kidneys in the human subject, particularly M. Bertin, inform us, that there are two sets of *tubuli uriniferi*; the one continued directly from the extremities of the renal artery, and the other springing from that vesicular texture which is conspicuous in the kidney.

It is in this vesicular part of the kidney that we presume the earthy particles first stagnate and coalesce: for it is hardly to be supposed, that such solid matters could be allowed to stop in the extremities of the renal arteries, since the blood, and the urine separated from it, must flow through these vessels with great degrees of force and velocity; but in the intermediate vesiculae the earthy particles may lie, and there attracting each other, soon come to acquire sensible degrees of magnitude, and thus become sand or gravel. As long as this sand or gravel formed in the vesicular part of the kidney lies quiet, there will be no pain or uneasiness, until the concretions become large enough to press either on the adjoining *tubuli*, or on the blood-vessels; then a sense of weight, and a kind of obtuse pain in the loins, will be felt. But when the small pieces of earthy matter shall be dislodged and washed off by the force of the circulating fluids, or loosened by some spasmodic action of the motory fibres in these parts, they will in their passage create pain, raise different degrees of inflammation, or perhaps lacerate some blood-vessels, and cause bloody

urine. When these little earthy concretions happen to be detained in the pelvis of the kidney, or any other place where a flow of urine continually passes, they soon increase in size, and become calculi, from the constant accession of earthy particles, which are attracted by the original bit of sand, which thus becomes the nucleus of a stone.

It is an opinion which Hippocrates first advanced, and which has been almost universally adopted by his followers, and hath remained till lately uncontroverted, that the stone and gravel are generated by the use of hard water. And from this quality, which the waters of certain springs possess, of depositing a large earthy sediment, either in the aqueducts thro' which they are conveyed, or in the vessels in which they are boiled or preserved, it was obvious to infer, that in passing through the kidneys, and especially whilst retained in the bladder, they would let fall their grosser particles, which by the continued apposition of fresh matter, connected by the animal gluten, and compacted by the muscular action of that organ, would in time form a calculus, sufficiently large to produce a train of the most excruciating symptoms. And this reasoning *à priori* has been supposed to be confirmed by facts and experience; for not to mention the authority of Hippocrates, Dr Lister has observed, that the inhabitants of Paris are peculiarly subject to the stone in the bladder. Nicholas de Blegny has related the history of one who was dissected at Paris, in whom the pylorus, a great part of the duodenum, and the stomach itself, were found incrustated with a stony matter, to the thickness of a finger's breadth. And it is well known, that the water of the river Seine, with which that city is supplied, is so impregnated with calcareous matter, as to incrustate, and in a short time to choke up, the pipes through which it runs. But on the other hand it is objected, that the human calculus is of animal origin, and by chemical analysis appears to bear very little analogy to the stony concretions of water: and though it is allowed, that more persons are cut for the stone in the hospitals at Paris, than in most other places; yet upon inquiry it is found, that many of those patients come from different provinces, and from towns and villages far distant from the Seine.

Dr Percival conjectures, that though this disease may chiefly depend upon a peculiar disposition to concrete in the animal-fluids, which in many instances is hereditary, and in no instance can with certainty be imputed to any particular cause; yet, hard water is at least negatively favourable to this diathesis, by having no tendency to diminish it. The urine of the most healthy person is generally loaded with terrene matter, capable, in favourable circumstances, of forming a calculus; as is evident from the thick crust which it deposits on the sides of the vessels in which it is contained. And it seems as if nature intended by this excretion to discharge all the superfluous salts of the blood, together with those earthy particles, which are either derived from our aliment, and fine enough to pass thro' the lacteals, though insuperable by the powers of circulation, or which arise from the abrasion of the solids, or from the dissolution of the red globular part of our fluids. Now water, whether used as nature presents us with it, or mixed with wine, or taken under the form of



of beer or ale, is the great diluter, vehicle, and menstruum, both of our food, and of the saline, earthy, and recrementitious parts of the animal-juices. And it is more or less adapted to the performance of these offices, in proportion to its degree of purity. For it must appear evident to the most ordinary understanding, that a menstruum already loaded, and perhaps saturated with different contents, cannot act so powerfully as one which is free from all sensible impregnation. Nor is this reasoning founded upon theory alone; for it is observed, that Malvern water, which issues from a spring in Worcestershire remarkable for its uncommon purity, hath the property of dissolving the little fabulous stones which are often voided in nephritic complaints. And the solution too, which is a proof of its being complete, is perfectly colourless. Hence this water is drunk with great advantage in disorders of the urinary passages. And during the use of it, the patient's urine is generally limpid, and seldom deposits any sandy sediment. Yet notwithstanding this appearance of transparency, it is certainly at such times loaded with impurities, which are so diluted and dissolved as not to be visible. For it is attended with a strong and fetid smell, exactly resembling that of asparagus. Hoffman mentions a pure, light, simple water in the principality of Henneberg, in Germany, which is remarkable for its efficacy in the stone and gravel; and a water of similar virtues was discovered not many years ago in the black forest, near Osterod, which upon examination did not afford a single grain of mineral matter. Indeed it is worthy of observation, that most of the springs which were formerly held in great esteem, and were called *holy wells*, are very pure, and yield little or no sediment.

Dr Percival informs us that a gentleman of Manchester, who had been long subject to nephritic complaints, and often voided small stones, was advised to refrain from his own pump-water, which is uncommonly hard, and to drink constantly the softer water of a neighbouring spring; and that this change alone, without the use of any medicine, hath rendered the returns of his disorder much less frequent and painful. A lady also, much affected with the gravel, was induced by the perusal of the first edition of Dr Percival's Essay, to try the effect of soft water; and by the constant use of it remained two years entirely free from her disorder.

In nephritic cases, distilled water would be an excellent substitute for Malvern Water, as the following experiment evinces.

Two fragments of the same calculus, nearly of equal weights, were immersed, the one in three ounces of distilled water, the other in three ounces of hard pump-water. The phials were hung up close together in a kitchen-chimney, at a convenient distance from the fire. After 14 days maceration, the calculi were taken out, and carefully dried by a very gentle heat. The former, viz. that which had been immersed in distilled water, was diminished in its weight a grain and half; the latter had lost only half a grain.

It is the passage of these calculi from the kidneys down into the bladder, which occasions the pain, vomiting, and other symptoms, that constitute what is usually termed a *fit of the gravel or stone*.

When an inflammation is actually raised, the dis-

ease is known by the name of *nephritis*, and has been already treated of.

As soon as the stone passes through the ureter, and falls into the bladder, the pain and other nephritic symptoms cease; and every thing will remain quiet, either till the stone is carried into the urethra, or until it has remained long enough in the bladder to acquire weight sufficient to create new distress.

If a stone happens to be smooth and of a roundish form, it may lie in the bladder and acquire considerable bulk before it can be perceived by the patient; but when it is angular, or has a rugged surface, even though it may be small in size, yet it seldom fails to raise pain, and occasion bloody urine, or the discharge of a slimy fluid, with tenesmus, and difficulty in making water.

There have been various attempts and pretences made to dissolve the stone. The things which have been found most effectual are those that powerfully absorb the fixed air from bodies, and at the same time readily combining with oils, render them miscible with water. There is scarce any earthy substance that abounds more in oil, and also contains such a quantity of fixed air as the human *calculus*; and hence it is that the caustic fixed alkaline salt is such a powerful solvent of the stone: but this being of a very acrid nature, it requires to be well sheathed by means of some gelatinous or mucilaginous vehicle. Veal-broth is as convenient as any for this purpose, and accordingly it is used by those who make a secret of the caustic alkali as a vehicle for the soap-lees.

Mr Blackrie, who has taken much pains in this inquiry, has proved very satisfactorily, that Chittick's nostrum is no other than soap-lees given in veal-broth, which the patients send every day to the Doctor, who returns it mixed up with the medicine, in a close vessel secured by a lock.

It is not every case, however, that either requires or will bear a course of the caustic alkali. Some calculi are of that soft and friable nature, that they will dissolve even in common water; and there are cases wherein it appears that the constant use of some very simple decoction or infusion of an insignificant vegetable, has brought away large quantities of earthy matter, in flakes which apparently have been united together in layers to form a stone. Dr Macbride assures us, that a decoction of raw coffee, only 30 berries in a quart of water, boiled till it acquired a deep greenish colour, taken morning and evening to the quantity of eight or ten ounces, with ten drops of sweet spirit of nitre, had the powerful effect of bringing away, in the course of about two months, as much earthy matter in flakes as filled a large tea-cup. The patient was far advanced in years; and, before he began this decoction, had been reduced to great extremities by the continuance of pain and other distressing symptoms: he was purged occasionally with *oleum ricini*.

An infusion of the seeds of *daucus sylvestris* sweetened with honey, is another simple and approved remedy; and has been found to give considerable ease in cases where the stomach could not bear any thing of an acrid nature: the leaves of the *uva ursi* were strongly recommended by the late very celebrated De Haen. But where the stomach will bear it, and there is no ulceration

tion in the case, nor excessive sensibility in the uropoietic organs, either the soap-less in new-milk or veal-broth, or soap-pills and lime-water, will bid fairest to do effectual service, either by dissolving the stony concretions, or at least rendering the sharp points and rugged surface less capable of injuring the sensible membranes of the parts where these hard bodies lodge, or happen to pass through.

In the Medical Commentaries, vol. 3. we have an account of a method used by the inhabitants of Arabia Petrea for curing the stone, to which they are very much subject, and which the author (an English gentleman of experience and candour) assures us he has seen frequently performed with never-failing success. By means of a catheter they inject into the bladder a weak lee of alkali with the purified fat of a sheep's tail and a proper quantity of opium all put together. Their catheters are made of gold, and in performing the operation they introduce them quite into the bladder; so that the composition is safely conveyed to the stone without hurting any other part. But when a stone is situated in the kidney, they have no method of cure.

If this method of curing by injection could be safely practised, it would no doubt greatly have the advantage over that of taking alkalies by the mouth, where the medicine is not only much weakened, but the constitution of the patient runs the risk of being greatly injured. But from some experiments mentioned in the second volume of the Medical Transactions, it appears that the human calculi are very different from one another in their natures. Some, for instance, will easily yield to an alkaline menstruum, and very little to an acid; while others are found to resist the alkali, and yield to the acid; and some are of such a compact nature, that they yield neither to acids nor alkalies. Dr Percival and others have shewn by experiments, that fixed air will dissolve some kinds of calculi; but whether these would not more readily be dissolved by alkalies or acids, hath not yet been discovered. This solvent, however, is much more safe than either of the other two, and ought always to be first employed; as it may perhaps facilitate the action of the others, though its own solvent powers should not be sufficient. An attention, however, to the fragments, scales, or films, which the stone may cast off, and also to the contents and sediment of the urine, may lead to the discovery of what solvent is proper, or whether the stone can be dissolved by any. To use either alkalies or acids improperly may be hurtful; though there may be such kinds of calculi as demand the alternate use of acids and alkalies; nay, there may be found calculi of opposite kinds in the same subject.

In such cases as will not allow us to think of dissolving the stony concretions, and where the only scheme is to palliate and procure ease from time to time, little more can be done than to keep the bowels open occasionally by some gentle cathartic, and wash off as much of the loose gravelly matter and slime as can be removed by such mild diuretic infusions and decoctions as shall be found to pass freely and sit well on the stomach. Persons afflicted with the stone should be careful in respect of their diet, and studiously avoid all heavy and flatulent food, as well as high sauces that are apt to turn rancid. For the same reason, butter and

acids are to be shunned; for these often create heart-burning, and every thing that offends the stomach raises the nephritic pain; such is the sympathy that obtains between the digestive and the uropoietic organs.

There have been surgeons bold enough to entertain an idea of cutting even into the kidney, in order to extract a stone: this, however, except in cases where an abscess has been formed, and nature points out the way, is merely chimerical. But cutting into the bladder for the same purpose, is an ancient and well-known operation, and often crowned with success. But a description of this operation belongs to the article SURGERY, to which we refer; and here shall only make this remark, that a surgeon should never begin his operation, until he and his assistants are perfectly satisfied, from actually feeling the stone, that there is one in the bladder; because it has sometimes happened, that when the incision has been made, no stone could be found: and the patient having died in consequence of the operation, and the body being opened, it has appeared that the symptoms which occasioned the belief of a stone in the bladder arose from some other cause.

When a dysuria proceeds from any acrimonious matter thrown into the blood, it may be readily cured by bleeding, emollient clysters, cooling and diluting drinks with gum arabic or gum tragacanth, linseed tea, or the warm bath. When it arises from inflammations of the bladder or parts adjoining to it, we are to regard it only as a symptomatic affection; and the remedies used to remove the primary disease will also remove the dysuria. Sometimes it may arise from an ulcer of the bladder, in which case it is generally incurable; a mild nutritious diet will, however, protract the patient's life.

### CCXIII. DYSPERMATISMUS, or Difficult EMISSION OF SEMEN. Genus CCXXV.

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Dyspermatismus, *Sauv. gen.* 260.  
Sterilitas, *Lin.* 171. *Sag.* 211.  
Agenesis, *Vog.* 283.

THIS impediment proceeds generally from obstructions in the urethra, either by tumours in itself, or in the cavernous bodies of the penis; in which case the treatment is the same as in the ischuria urethralis; sometimes it is owing to a kind of epileptic fit which seizes the man in the venereal act; and sometimes the semen, when ejected from the proper receptacles, is again absorbed by them, or flows into the bladder, and is expelled along with the urine. The last case is very difficult, or indeed impossible to cure; as proceeding from scirrhi, or other indissoluble tumours of the verumontanum, or the neighbouring parts. In some it proceeds merely from too violent an erection; in which case emollient and relaxing medicines will be of service, and we have an example of a cure performed by means of these in the first volume of the Edinburgh Medical Essays.

### CCIV. AMENORRHOEA, SUPPRESSION of the MENSES. Genus CCXXVI.

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Amenorrhœa, *Vog.* 130.  
Dysmenorrhœa, *Lin.* 168. *Sag.* 218.

THIS, with some other symptoms, as dyspepsia, yellowish,

PRACTICE yellowish or greenish colour of the skin, unusual appetites, &c. constitutes the *chlorosis* already treated off, and which seldom or never appears without a suppression of the menses. In Dr Home's Clinical Experiments we find the virtues of several emmenagogues set forth in the following manner. Chalybeates seldom or never succeeded: they were always found more useful in diminishing the evacuation when too violent, than in restoring it when deficient. The tincture of black hellebore proved successful only in one of nine or ten cases, though given to the length of four tea-spoonfuls a-day, which is double the quantity recommended by Dr Mead. Compression of the crural artery, recommended by Dr Hamilton in the Physical and Literary Essays, Vol. II. proved successful only in one of six cases. From the effects produced by this compression, it has the strongest appearance of loading the uterus with blood; from the sensations of the patient it produces the same effects as the approach of the menses, and has every appearance in its favour; yet does not succeed. Dr Home supposes that the uterus is more frequently in too plethoric and inflammatory a state, when this remedy will do hurt, than in a state of inanition; however, he owns, that in the case in which it did succeed, the patient was plethoric and inflammatory. Venesection is recommended as an excellent remedy; the Doctor gives three instances of its success, and says he could give many more. It acts by removing the plethoric state of the uterus, relaxing the fibres, and giving the vessels full play; so that their action overcomes all resistance, and the evacuation takes place. It is of no great moment from whence the blood is taken: the saphena vein will perhaps empty the uterus most; but it is difficult to get the proper quantity from it, and it cannot be so well measured. The powder of favae is a powerful remedy; and proved successful in three cases out of four in which it was tried. It was given in the quantity of half a drachm twice a-day. It is a strong topical stimulus, and seems improper in plethoric habits. Madder root is a very powerful medicine in this disease; and proved successful in 14 out of 19 cases in which it was tried, being sometimes exhibited in the quantity of two scruples, or a drachm, four times a-day. It has scarce any sensible effects; never quickens the pulse, or excites inflammatory symptoms: on the contrary, the heat, thirst, and other complaints abate; and sometimes these symptoms are removed, though the disease is not cured; but when it succeeds, the menses appear from the third to the 12th day.—For other methods of curing the amenorrhœa, see CHLOROSIS.

We have now considered all those diseases enumerated in Dr Cullen's Nosology, whose cure is to be attempted chiefly by internal medicines. The other genera either require particular manual operations, or a very considerable use of external applications; and therefore properly fall under the article SURGERY. It now remains to treat of some diseases which are not yet arranged in his system.

#### CCXV. ANGINA PECTORIS.

Dr HEBERDEN was the first who described this disease, though it is extremely dangerous, and, by his account, not very rare. It seizes those who are subject

to it, when they are walking, and particularly when they walk soon after eating, with a most disagreeable and painful sensation in the breast, which seems to threaten immediate destruction: but the moment they stand still, all the uneasiness vanishes. In all other respects the patients at the beginning of this disorder are well, and have no shortness of breath; from which the *angina pectoris* is totally different. After it has continued some months, the fits will not cease instantaneously on standing still; and it will come on not only when the patients are walking, but when they are lying down, and oblige them to rise up out of their beds every night for many months together. In one or two very inveterate cases, it has been brought on by the motion of a horse or carriage; and even by swallowing, coughing, going to stool, speaking, or by any disturbance of mind. The persons affected were all men, almost all of whom were above 50 years of age, and most of them with a short neck and inclining to be fat. Something like it, however, was observed in one woman, who was paralytic; and one or two young men complained of it in a slight degree, and other practitioners have observed it in very young persons.

When a fit of this sort comes on by walking, its duration is very short, as it goes off almost immediately upon stopping. If it come on in the night, it will last an hour or two. Dr Heberden met with one in whom it once continued for several days, during which time the patient seemed to be in imminent danger of death. Most of those attacked with the disorder died suddenly: though this rule was not without exceptions; and Dr Heberden observed one who sunk under a lingering illness of a different nature.

The *os sterni* is usually pointed to as the seat of this malady; but it seems as if it was under the lower part of that bone, and at other times under the middle or upper part, but always inclining more to the left side; and sometimes there is joined with it a pain about the middle of the left arm.

The appearance of Dr Heberden's paper in the Medical Transactions very soon raised the attention of the faculty, and produced other observations from physicians of eminence; namely, Dr Fothergill, Dr Wall of Worcester, Dr Haygarth of Chester, and Dr Percival of Manchester. It also induced an unknown sufferer under the disease to write the Doctor a very sensible letter, describing his feelings in the most natural manner; which, unfortunately, in three weeks after the date of this anonymous epistle, terminated in a sudden death, as the writer himself had apprehended.

The youngest subject that Dr Fothergill ever saw afflicted with this disorder, was about 30 years of age; and this person was cured. The method that succeeded with him, was a course of pills, composed of the mass of gum pill, soap, and native cinabar; with a light chalybeate bitter: this was continued for some months, after which he went to Bath several successive seasons, and acquired his usual health: he was ordered to be very sparing in his diet; to keep the bowels open; and to use moderate exercise on horseback, but not to take long or fatiguing walks.

The only symptom in this patient that is mentioned, was a stricture about the chest, which came on if he was walking up hill or a little faster than ordinary, or if he was riding a very brisk trot; for moderate ex-



ercise of any kind did not affect him: and this uneasy sensation always obliged him to stop, as he felt himself threatened with immediate death if he had been obliged to go forward.

It is the sharp constrictive pain across the chest, that (according to Dr Fothergill's observation) particularly marks this singular disease; and which is apt to supervene a certain degree of muscular motion, or whatever agitates the nervous system.

In such cases as fell under the inspection of Dr Fothergill, he very seldom met with one that was not attended with an irregular and intermitting pulse; not only during the exacerbations, but often when the patient was free from pain and at rest: but Dr Heberden observes, that the pulse is, at least sometimes, not disturbed; and mentions his having once had an opportunity of being convinced of this circumstance, by feeling the pulse during the paroxysm.

But no doubt these varieties, as well as many other little circumstances, will occur in this disease as they do in every other, on account of the diversity of the human frame; and if those which in general are found to predominate and give the distinguishing character be present, they will always authorize us in giving the name to the disease: thus, when we find the constrictory pain across the chest, accompanied with a sense of strangling or suffocation; and still more, if this pain should strike across the breast into one or both arms; we should not hesitate to pronounce the case an *angina pectoris*.

As to the nature of this disease, it appears to be purely spasmodic: and this opinion will readily present itself to any one who considers the sudden manner of its coming on and going off; the long intervals of perfect ease; the relief afforded by wine, and spirituous cordials; the influence which passionate affections of the mind have over it; the ease which comes from varying the posture of the head and shoulders, or from remaining quite motionless; the number of years which it will continue, without otherwise disordering health; its bearing so well the motion of a horse or carriage, which circumstance often distinguishes spasmodic pains from those which arise from ulcers; and lastly, from its coming on for the most part after a full meal, and in certain patients at night, just after the first sleep, at which time the incubus, convulsive asthma, and other ills, justly attributed to the disordered functions of the nerves, are peculiarly apt to return or to be aggravated.

But though it should be admitted, that the whole distress in these cases arises from spasm, it may not be so easy to ascertain the particular muscles which are thus affected.

The violent sense of strangling or choking, which shews the circulation through the lungs to be interrupted during the height of the paroxysm; and the peculiar constrictive pain under the sternum, always inclining (according to Dr Heberden's observation) to the left-side; together with that most distressing and alarming sensation, which, if it were to increase or continue, threatens an immediate extinction of life; might authorize us to conclude that the heart itself is the muscle affected: the only objection to this idea, and, if it had been constantly observed, it would be insurmountable, is, that the pulse is not always interrupted

during the paroxysm. The appearances in two of the dissections, favour the opinion that the spasm affects the heart; as in one subject the left ventricle (and, tho' it be not mentioned, we may presume the right one also), was found as empty of blood as if it had been washed; and in another, the substance of the heart appeared whitish, not unlike a ligament; as it should seem, in both cases, from the force of the spasm squeezing the blood out from the vessels and cavities.

If this hypothesis be allowed, we must conclude that the spasm can only take place in an inferior degree, as long as the patient continues to survive the paroxysm; since an affection of this sort, and in this part, of any considerable duration or violence, must inevitably prove fatal: and accordingly, as far as could be traced, the persons who have been known to labour under this disease have in general died suddenly.

The dissections also shew, that whatever may be the true seat of the spasm, it is not necessary for the bringing of it on, that the heart, or its immediate appendages, should be in a morbid state; for in three out of the six that have as yet been made public, these parts were found in a sound state.

On opening the body of the poor gentleman who wrote the letter to Dr Heberden, "upon the most careful examination, no manifest cause of his death could be discovered; the heart, in particular, with its vessels and valves, were all found in a natural condition."

In the case communicated by Dr Percival to the publishers of the Medical Commentaries, "the heart and aorta descendens were found in a sound state." And in Dr Haygarth's patient, "on opening the thorax, the lungs, pericardium, and heart, appeared perfectly sound." Not to mention Dr Fothergill's patient (R. M.), in whose body the only morbid appearance about the heart was a small white spot near the apex. So that the cause, whatever its nature might have been, was at too great a distance, or of too subtle a nature, to come under the inspection of the anatomist. But there was a circumstance in two of the subjects that is worthy of remembrance; and which shews that the crasis of the blood, while they were living, must have been greatly injured, namely, its not coagulating, but remaining of a cream-like consistency, without any separation into serum and crassamentum.

From all that we have seen hitherto published, it does not appear that any considerable advances have been made towards the actual cure of this anomalous spasm.

The very judicious and attentive Dr Heberden (to whom the public are highly obliged for first making the disorder known) confesses, that bleeding, vomits, and other evacuations, have not appeared to do any good: wine and cordials, taken at bed-time, will sometimes prevent or weaken the fits; but nothing does this so effectually as opiates; in short, the medicines usually called *nervous* or *cordial*, such as relieve and quiet convulsive motions, and invigorate the languishing principle of life, are what he recommends.

Dr Wall mentions one patient, out of the 12 or 13 that he had seen, who applied to him early in the disease, and was relieved considerably by the use of antimonial medicines joined with the fetid gums: he was

still

PRACTICE fill living at the time the Doctor wrote his paper, (November 1772), and going about with tolerable ease. Two were carried off by other disorders; all the rest died suddenly.

Dr Fothergill's directions are chiefly calculated with the view to prevent the disorder from gaining ground, and to alleviate present distress. Accordingly he enjoins such a kind of diet as may be most likely to prevent irritability: in particular, not to eat voraciously: to be particularly abstemious in respect to every thing heating; spices, spirits, wines, and all fermented liquors: to guard most scrupulously against passion, or any vehement emotions; and to make use of all the usual means of establishing and preserving general health: to mitigate excesses of irritability by anodynes; or pains, if they quicken the circulation: to disperse flatulencies when they distend the stomach, by moderate doses of carminatives; amongst which, perhaps, simple peppermint water may be reckoned one of the safest. But since obesity is justly considered as a principal predisposing cause, he insists strongly on the necessity of preventing an increase of fat, by a vegetable diet, and using every other practicable method of augmenting the thinner secretions.

These were the only means which occurred to the English physicians of opposing this formidable disease: but Dr Smyth of Ireland has since discovered that it may be certainly cured by issues, of which Dr Macbride gives the following instance.

"A. B. a tall, well-made man; rather large than otherwise; of healthy parents, except that there had been a little gout in the family; temperate; being very attentive to the business of his trade (that of a watch-maker), led a life uncommonly sedentary; had, from his boyhood upwards, been remarkably subject to alarming inflammations of his throat, which seized him, at least, once in course of the year; in all other respects well.

"In 1767, (then 48 years of age), he was taken, without any evident cause, with a sudden and very dispiriting throbbing under the sternum. It soon afterwards increased, and returned upon him every third or fourth week, accompanied with great anxiety, very laborious breathing, choking, a sensation of fulness and distension in the head, a bloated and flushed countenance, turgid and watery eyes, and a very irregular and unequal pulse. The paroxysm invaded, almost constantly, while he was sitting after dinner; now and then he was seized with it in the morning, when walking a little faster than usual; and was then obliged to stop, and rest on any object at hand. Once or twice it came on in bed; but did not oblige him to sit up, as it was then attended with no great difficulty in breathing. In the afternoon fits, his greatest ease was from a supine posture; in which he used to continue motionless for some hours, until, quite spent and worn out with anguish, he dropt into a slumber. In the intervals between these attacks, which at length grew so frequent as to return every fourth or fifth day, he was, to appearance, in perfect health.

"Thus matters continued for more than two years; and various antispasmodics were ineffectually tried for his relief. In 1769, there supervened a very sharp constrictory pain at the upper part of the sternum,

stretching equally on each side, attended with the former symptoms of anxiety, dyspnoea, choking, &c. and with an excruciating cramp, as he called it, that could be covered with a crown-piece, in each of his arms, between the elbow and the wrist, exactly at the insertion of the pronator teres; the rest of the limb was quite free. The fits were sometimes brought on, and always exasperated, by any agitation of mind or body. He once attempted to ride o'horsecback during the paroxysm; but the experiment was near proving fatal to him. The difference of season or weather made no impression upon him. Still, in the intervals, his health was perfectly good; except that his eyes, which before his illness were remarkably strong and clear, were now grown extremely tender; and that his sight was much impaired. He had no flatulency of stomach, and his bowels were regular.

"In this situation, February 22. 1770, he applied to me for assistance. I had seen, I believe, eight or ten of these frightful cases before. Two of the patients dropt dead suddenly. They were men between 40 and 50 years of age, and of a make somewhat fleshy. The fate of the others I was not informed of; or, at least, cannot now recollect.

"Having found the total inefficacy of blisters and the whole class of nervous medicines in the treatment of this anomalous spasm, I thought it right to attempt the correcting or draining off of the irritating fluid in the case now before us. To this purpose, I ordered a mixture of *aq. calc. mag. c.* with a little of the *aq. junip. c.* and an alterative proportion of Huxham's antimonial wine: I put the patient on a plain, light, perspirable diet; and restrained him from all viciid, flatulent, and acrimonious articles. By pursuing this course, he was soon apparently mended; but after he had persisted regularly in it for at least two months, he kept for some time at a stand. I then ordered a large issue to be opened in each of his thighs. Only one was made. However, as soon as it began to discharge, his amendment manifestly increased. The frequency and severity of the fits abated considerably; and he continued improving gradually, until, at the end of 18 months, he was restored to perfect health; which he has enjoyed, without the least interruption, till now, except when he has been tempted (perhaps once in a twelvemonth) to transgress rules, by making a large meal on salted meat, or indulging himself in ale or rum-punch, each of which never failed to disorder him from the beginning of his illness: and, even on these occasions, he has felt no more than the slightest motion of his former sufferings; inasmuch that he would despise the attack, if it did not appear to be of the same stock with his old complaint. No other cause has had the least ill effect on him.

"Though rum was constantly hurtful, yet punch made with a maceration of black currants in our vulgar corn-spirit, is a liquor that agrees remarkably well with him.

"He never took any medicine after the issue began to discharge; and I have directed that it shall be kept open as long as he lives. The inflammations of his throat have disappeared for five years past; he has recovered the strength and clearness of his sight; and his health seems now to be entirely re-established."

Doctor

Doctor Macbride, in a letter to Dr Duncan, gives the following additional observations on this disease.

"Within these few weeks I have, at the desire of Dr Smyth, visited, three or four times, a very ingenious man who keeps an academy in this city, of about 34 years of age, who applied to the Doctor for his advice in January last.

"I shall give you his symptoms as I had them from his own mouth, which appear to me to mark his case to be an angina pectoris, and as deplorable as any that I have read of. It was strongly distinguished by the exquisite constrictory pain of the sternum, extending to each of his arms as far as the insertion of the deltoid muscle, extreme anxiety, laborious breathing, strangling, and violent palpitation of the heart, with a most irregular pulse. The paroxysms were so frequent, that he scarcely ever escaped a day, for six or seven years, without one. They were usually excited by any agitation of mind or body, though slight. He had clear intervals of health between the fits. The distemper seemed hereditary in him, as he says his father was affected in the same manner some years previous to his death. He has a strong gouty taint, which never shewed itself in his limbs; and he has led a life of uncommon sedentariness, from intense application to mathematical studies, attention of mind, and passion, even from his boyish years. These circumstances may, perhaps, account for his having been taken with this disease at so early an age as 17.

"A large issue was immediately opened in each of his thighs. In a month afterwards he began to mend, and has gone on improving gradually. He can now run up stairs briskly, as I saw him do no later than yesterday, without hurt; can bear agitation of mind; and has no complaint, excepting a slight oppression of the breast, under the sternum, which he feels sometimes in a morning, immediately after dressing himself, and which he thinks is brought on by the motion used in putting on his clothes; though for a complete week preceding the day on which I saw him last, he told me that he had been entirely free from all uneasiness, and was exulting that he had not had such an interval of ease for these last seven years.

"Doctor Smyth also shewed me, in his *adversaria*, the case of a gentleman who had been under his care in 1760, which he had forgotten when my book went to the press, and which he was reminded of the other day by a visit from his patient. It was a genuine angina pectoris, brought on by a very sedentary life, and great vexation of mind, clearly marked by the exquisite pain under the sternum, that extended acutely to the upper extremities, particularly along the left arm, together with the other symptoms of dyspnoea, anxiety, palpitation of the heart, &c. recited in the case above. The disorder went off in 1762, by large spontaneous discharges from the piles, but returned upon him severely in 1765. Issues in his thighs were then recommended to him, but not made. But, whether it was by the persuasion of some friend, or of his own accord, he went into a course of James's powder, in small alterative doses, combined with a little castor and asa fetida. This he persisted in for about six weeks; in the meanwhile, he had large acrimonious gleetings from the scrotum, and a plentiful discharge of ichor from the anus.

From this time he began to find his complaints grow less and less distressing, and he has now been totally free from them for six years past."

#### CCXVII. THE PUERPERAL or CHILD-BED FEVER.

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THIS species of fever, as its name imports, is peculiar to women in child-bed; and is usually the most fatal of all the disorders to which the sex is liable. But, notwithstanding the prevalence of it in all ages, its real nature has remained, to the present times, a subject of much dispute and uncertainty. The critical period of its invasion, when febrile commotions are apt to be excited by various accidents, and the equivocal symptoms which accompany it, have even afforded room for questioning whether it be a primary or a secondary disease. Some writers have considered it as proceeding entirely from an inflammation of the uterus; others have imagined it to be the consequence of an obstruction to the secretion of the milk; while the greater number has been inclined, for reasons equally if not more plausible, to impute it to a suppression of the lochia. If we examine this fever attentively, however, according to its natural course, and independently of all the accidental concomitant symptoms with which it is not essentially connected, we may safely pronounce it to be a primary disease of a particular characteristic, and perhaps not the necessary consequence of any of the causes above-mentioned.

This fever is most generally incident to women within 48 hours after delivery, though it may supervene on the fourth or fifth day, and sometimes considerably later. It is preceded, like other fevers, by a rigor, which is commonly violent; and, when happening during the time of labour, may be confounded with the pains of parturition. In its earlier stage it is attended with the signs of inflammation. A great pain is felt in the back, hips, and the region of the uterus; which, in the part last mentioned, is accompanied with the sense of heat and throbbing. A sudden change in the quality or quantity of the lochia now also takes place; the patient is frequently troubled with a tenesmus; and the urine, which is very high coloured, is discharged in small quantity and with pain. At the first attack of the fever, the woman is generally seized with a vomiting of porraceous matter, as in the *cholera morbus*, to which disease it then bears a strong resemblance. But instead of this symptom, there is sometimes only a nausea, or loathing of the stomach, with a disagreeable taste in the mouth. The belly swells to a considerable bulk, and becomes susceptible of painful sensations from the slightest impression. The tongue is generally dry, though sometimes moist, and covered with a thick brownish fur. When the fever has continued a few days, the symptoms of inflammation usually subside, and the disease acquires a more putrid form. At this period, if not at the very beginning of the disorder, a bilious or putrid diarrhoea, of a dangerous and obdurate nature, supervenes, and accompanies it through all its future progress; each motion to stool being preceded by a temporary increase, and followed by an alleviation of pain. The patient usually nauseates all kind of food and drink, except what is cold and acidulated. A brown or blackish fœtus, the consequence of putrid exhalations, adheres to the edges



of the teeth; a troublesome hiccup is at length produced, which greatly exasperates the pains of the abdomen; petechiæ or vibices also appear, with sometimes a military eruption, but which produces no mitigation of the disease. Thro' the whole course of the fever, the patient is affected with great anxiety and dejection of spirits.

Such in general is the course of the puerperal fever; the symptoms of which, however, may be often varied, according to the constitution of the patient, the degree of the disease, and its earlier or later invasion. When the woman is naturally weak, or her strength has been greatly reduced by immoderate evacuations after delivery; when the disease is violent, and immediately follows that period; its progress and termination are proportionably rapid and fatal. In such unfortunate circumstances, many have been known to expire within 24 hours from the first attack of the disease; nay, there are some instances where the rigor has concluded the scene. The catastrophe, however, is most generally suspended for some days; and the number of these is variable, though the 11th from the commencement of the fever, may justly be fixed as the period which is usually decisive. In whatever stage of the disease an unfavourable termination may happen, it would seem as if the commencement of the patient's recovery were not marked by any critical revolution of the fever, as depending on an alteration of the humours; but that the cure is gradually effected, either by a spontaneous vomiting, or a long-continued discharge by stool of that porraceous matter, the existence of which in the stomach is usually evinced at the first attack of the disease. The most unfavourable prognostic, therefore, arises from such a weakness of the patient as renders her unable to support so tedious an evacuation as that by which the fever is overcome. When the lochia return to their former state, when the swelling and tenderness of the abdomen abate, and there is a moisture on the skin, we have reason to hope for a happy termination of the disease.

Though the puerperal fever may generally be ascertained from the description which has been given, and chiefly by that remarkable tenderness of the abdomen, which particularly distinguishes it; yet, as some of its symptoms may be confounded with those arising from other diseases, and which require a different method of cure, it will be proper to mention here the circumstances whereby it may be known with greater certainty.

The pains of the abdomen, attending the child-bed fever, may be distinguished from those called *after-pains*, by their uninterrupted continuance through the course of the disease, though sometimes they suffer exacerbations; whereas, in the latter, they often totally intermit. They are also distinguishable by the absence of fever with concomitant symptoms in the one, and their evident existence in the other.

Many circumstances evince a dissimilarity between the puerperal and military fevers, notwithstanding the symptoms of anxiety and oppression are common to both; inasmuch that the nature of the approaching disease may be ascertained at the very commencement of its attack. In the puerperal fever the rigor is more violent, of longer duration, and not interrupted, as in the other. The pulse is fuller and stronger; the skin

is more hot; and the tongue, whether moist or dry, tho' generally the latter, is not of a white, but brownish appearance; and the urine is also higher coloured. Eruptions, which are critical in military fevers, procure no mitigation of the puerperal, and cordials generally increase it.

When the original attack of the puerperal fever happens to coincide with the febrile commotion which is excited in child-bed women by the milk, the nature of it may at first be misapprehended; but the concomitant symptoms, and greater violence of the disease, must in a short time dissipate such an error.

From all the most accurate accounts of this disease, and from the period at which it generally commences, there seems reason to conclude, that it owes its rise more immediately to accidents after delivery. For it is allowed that it may follow a labour under the best and most favourable circumstances, though endeavours to dilate the os internum are supported frequently to produce it. The more immediate causes generally assigned by authors are a stoppage of perspiration, the too free use of spices, and the neglect of procuring stools after delivery; sudden frights, too hasty a separation of the placenta, and binding the abdomen too tight. The putrid appearance, however, which this disease so soon assumes, affords ground to suspect that the predisposing cause of it is a vitiated state of the humours; for it is generally observed to be most prevalent in an unhealthy season, and among women of a weakly and scorbutic constitution.

Within these few years this fever has been treated of by several writers, most of whom have differed from each other in their sentiments of the nature of the disease. The first in the order of publication is Dr Denman, who seems to be of opinion, that it may derive its origin either from a redundancy or too great acrimony of the bile, the secretion of which appears to be much interrupted in the time of gestation. In Dr Manning's treatise on this fever, he mentions its being highly probable that such a cause contributes greatly to produce the disease, especially where the putrid tendency of the humours is increased by unwholesome air and diet.

It has likewise been the fate of the puerperal fever, that no disease has more divided the sentiments of physicians in regard to the method of cure. The apparent indications and contra-indications of bleeding, and other remedies, arising from the complication of inflammatory and putrid symptoms; the equivocal appearance of the vomiting and purging, as whether they are critical or symptomatic; and the different causes whence symptoms similar to each other may arise in pregnant women; all these circumstances concur to involve the subject in great obscurity and indecision. If we carefully attend to the several characteristics of the disease, however, so as to be able to distinguish it from every other puerperal complaint, and observe at the same time the usual manner of its development, our judgment may be guided in the method of cure by the salutary efforts of nature. But, in order to obtain a clearer view of the genuine indications, it will be proper to consider them under the several lights in which they have been generally agitated by authors.

One of the most essential points to be ascertained in the

the cure of the child-bed fever, respects the propriety of bleeding. A free use of the lancet has been generally regarded as the most successful expedient in practice; and there are some instances of critical hæmorrhages which would seem to confirm its utility. But Dr Denman thinks we may safely affirm from experience, that for one who will be benefited by large bleeding, a much greater number will be injured, and that even almost irretrievably. Nor can this seem surprising, when we consider the situation of child-bed women. In most, the evacuations consequent upon delivery are sufficient to diminish any undue superabundance of the fluids; and if, as frequently happens, the disease be produced by too hasty a separation of the placenta, the consequence of which is generally a very copious discharge of blood, can we ever suppose that nature will be assisted in overcoming the febrile commotion, by the farther evacuation of the vital fluid, through the defect of which she is now rendered unequal even to the ordinary support of the animal economy? We may appeal to every practical physician, how much he has known the pulse to sink, and what a train of nervous symptoms he has observed to succeed an excess of the discharge abovementioned. Besides, it is an axiom in physic, that a remedy which cures any disorder, will always prove sufficient to prevent it; and therefore, if bleeding were the proper cure in the child-bed fever, the disease ought to have been prevented by a large evacuation of blood, when that happened previous to its seizure. Experience, however, in this, as in all other diseases, is the only unerring guide we can follow; and whoever regulates his practice by fact and observation, will be convinced that bleeding, especially in a larger quantity, is, in general, very far from being attended with success. Bleeding is seldom proper, except in women of plethoric constitutions, and in whom the signs of inflammation rise high. Nor even in such patients ought it to be repeated without great caution, and the existence of strong indications. Bleeding, when used in proper circumstances, may unquestionably palliate the fever; but that it often shortens the duration of it, appears to be a matter of much doubt. On this account the practice becomes still more suspicious and exceptionable, when we consider that by venesection improperly used the person's strength may be so far reduced as not to support the tedious looseness by which the disease is generally carried off. Though bleeding, however, ought in general to be used with great caution, there are certainly many cases in which it is both necessary and advantageous.

The genuine nature and effects of the looseness, in this disease, is another controverted point of the highest importance, and which merits the most attentive inquiry. Physicians, observing that women who die of the puerperal fever are generally molested with that evacuation, have been induced to consider this symptom as of the most dangerous and fatal tendency; and what, therefore, we should endeavour by every means to restrain. In this opinion, however, they would seem to have been governed by too partial an observation of facts. For experience certainly authorises the assertion, that more women appear to have recovered of the child-bed fever, through the intervention of a diarrhoea, than have been destroyed by that cause. If

it also be considered, that purging is usually almost the only sensible evacuation in the more advanced state of the disease, and is that which accompanies it to its latest period, we shall have the strongest reason to think that it is critical rather than symptomatical, and ought therefore to be moderately supported, instead of being unwarily restrained. Nay, the advantage which is found to attend vomiting as well as purging, in the earlier stage of the disease, would seem to evince that the matter discharged by these evacuations is what chiefly foment the disease. Emetics and purgatives, therefore, in the opinion of Dr Manning, are the only medicines on which any rational dependence is to be placed in this fever; at least, they are certainly such as are found the most successful. It is an established rule in practice, to prescribe a vomit at the beginning of every fever attended with any nausea or loathing of the stomach, and where there is not any reason to apprehend an inflammation of that organ. Nor does the state of child-bed women afford the smallest ground for prohibiting our recourse to the same expedient in answering a similar indication.

It is so seldom a physician is called during the rigor preceding the puerperal fever, that he has few opportunities of trying the effects of remedies in that early state of the disease. When such occur, however, we should endeavour as much as possible to abate and shorten that period, as the succeeding fever is generally found to bear a proportion to the violence and duration of it. For this purpose warm diluting drinks should be plentifully used, with a small quantity of volatile spirits or brandy. When Dr Manning apprehended such an accident, he sometimes ordered the nurse to give immediately a dish or two of warm sack-whey; taking care that it was not too strong, which is a caution that ought always to be remembered. For though a freer use of the more cordial and spirituous kinds of liquors might perhaps sooner abate the rigor, there is danger to be feared from their influence on the approaching fever, especially in women of a strong and healthy constitution. In all cases, warm applications to the extremities, such as heated bricks, towels, or toasted grains in a linen bag, may be used with perfect safety, and some advantage.

When the hot fit is advanced, the first thing Dr Manning orders is some emollient injection, as chicken-water, or water and milk, which ought to be frequently repeated through the course of the disease. These prove beneficial, not only by promoting the discharge from the intestines, which seems in fact to be the solution of the disease; but also by acting as a kindly fomentation to the uterus and adjacent parts. In this intention they are particularly serviceable when the lochia are suppressed. Great care, however, is requisite in administering them, on account of the tenderness, and inflammatory disposition, which at that time render the parts in the pelvis extremely susceptible of pain.

The next step in the method of cure ought to be to promote the discharge of the morbid matter both by the stomach and intestines. This intention is best answered by the remedy prescribed by Dr Denman, of which the following is the receipt.

R. Tar-

R. Tartar. emetic. gr. ii.

Ocul. cancer. præp. ʒi. Intimè miscantur.

Of a powder thus prepared, Dr Denman gives from two to six grains, and repeats it as circumstances require. If the first dose does not procure any sensible operation, he repeats it in an increased quantity at the end of two hours, and proceeds in that manner; not expecting any benefit but from its sensible evacuation.

Should the disease be abated, but not removed, (which sometimes happens), by the effect of the first dose, the same medicine must be repeated, but in a less quantity, till all danger is over. But if any alarming symptoms remain, he does not hesitate one moment to repeat the powder, in the same quantity as first given; tho' this is seldom necessary, if the first dose operates properly.

It is to be observed, says Dr Denman, that as the certainty of cure depends upon the proper repetition of the medicine, the method of giving it at stated hours does not appear eligible. If the first dose produces any considerable effect by vomiting, procuring stools, or plentifully sweating, a repetition of the medicine in a less quantity will seldom fail to answer our expectations; but great judgment is required in adapting the quantity first given to the strength of the patient and other circumstances. We are not to expect that a disease which from the first formation carries so evident marks of danger, should instantly cease, even though a great part of the cause be removed.

Frequent doses of the saline draughts ought also to be given, which not only promote the evacuation by the intestines, but likewise increase the salutary discharges of urine and perspiration. These medicines are particularly serviceable in subduing the remains of the fever, after its violence has been broken by the more efficacious remedies abovementioned; but when they are used even in the decline of the disease, gentle laxatives of rhubarb and magnesia, as advised by Dr Denman, ought to be frequently interposed, since, as he justly observes, without stools we can do little service.

Notwithstanding the discharge by the intestines appears to have the most salutary effect in this disease, yet when the stomach has not been properly unloaded of offensive matter, though a great nausea and sickness had indicated the expediency of such an evacuation at the beginning of the fever, the continuance of the looseness is sometimes so long protracted as in the end to prove fatal. In this alarming state of the disease, when the stools are very frequent and involuntary, and all appearances threaten danger, Dr Denman says, that a clyster of chicken-water injected every one, two or three hours, or as often as possible without fatiguing the patient too much, with the following draught taken every six hours, has produced better effects than could be expected.

R. Pulv. rad. ipecacuan. gr. i.

Confect. Damocrat. ʒi.

Aq. alexiter. simp. vel

Cinnamon. simp. ʒiſs. M. f. Haustus.

While these medicines are using, we should endeavour to mitigate the pains of the belly by relaxing applications. During the course of the disease, the patient ought to drink freely of diluting liquors, and ab-

stain from every thing of a heating quality, unless great faintness should indicate the use of a small quantity of some cordial medicine.

Such is the practice recommended in this disease by Dr Denman. We shall now take a cursory view of the sentiments of succeeding writers on this subject.

According to Dr Hulme, the proximate cause of the puerperal fever is an inflammation of the intestines and omentum; for the confirmation of which opinion he appeals to dissections. He supposes the chief predisponent cause of the disease to be the pressure of the gravid uterus against the parts abovementioned. The omentum, says he, in the latter stage of pregnancy, must either be flat, which is its natural situation, or be rumpled or carried up by the gravid uterus in folds or doublings. When the latter is the case, which he observes is probably not seldom, the danger of a strangulated circulation will be greater.

Mr White, who has also written on this disease, judiciously remarks, that were Dr Hulme's hypothesis well founded, the disorder ought rather to take place before delivery, and be immediately removed at that period: That it would likewise most generally happen to women at their first labour, when the abdominal muscles are less yielding, and the pains more violent; the contrary of which is most frequently experienced to be the case.

It also deserves to be remarked, that, upon Dr Hulme's supposition, we cannot account for the disease being more common and fatal in large towns and in hospitals, than in the country and private practice, while other inflammatory disorders are more endemic among those who live in the latter than the former situation. Even admitting the friction of the intestines and omentum against the uterus to be as violent as Dr Hulme supposes, is it not highly improbable, that any inflammation could be occasioned by the pressure of such soft substances upon each other? Or, were this effect really produced, ought not the puerperal fever to be more common and fatal after the most laborious deliveries? But this observation is not supported by experience.

Dr Hulme, in favour of his own hypothesis, alleges that it gives a satisfactory answer to the question, "Why all lying-in women have been, and ever will be, subject to this disease?" In this proposition, however, the Doctor supposes such a universality of the disease as is not confirmed by observation. It is affirmed upon undoubted authority, that in many parts of Britain the puerperal fever is hardly known; whereas, were it really produced by the causes he assigns, it would be equally general and unavoidable.

But how peculiar soever this author's sentiments are in respect of the proximate cause of the disease, they have not led him to any method of cure different from the established practice. On this subject Dr Hulme divides his observations into two parts, comprehending under the former the more simple method of treatment, and under the latter the more complex. He sets out with remarking, that the patient being generally colicive at the beginning of the disease, an emollient opening clyster will often give immediate relief; but if this should not prove effectual, recourse must be had to cathartics. Those which he found answer his purpose



best, were the *sal catharticus amarus*, the *oleum ricini*, emetic tartar, and antimonial wine. When the bowels have been sufficiently cleared and the pain abates, he advises encouraging a gentle diaphoresis by medicines which neither bind the body nor are heating, such as small doses of ipecacuan, emetic tartar, and antimonial wine, combined with an opiate in a moderate dose, and given once or twice in the course of 24 hours; administering the saline draughts in the intermediate spaces. If, preceding or during this course, a sickness of the stomach or vomiting attend, he advises assisting the efforts of nature, by drinking plentifully of camomile tea, warm water, or any other diluting liquor. He concludes with recommending a cooling regimen, rest of body, and tranquillity of mind; prohibiting all kinds of bandage upon the abdomen, and enjoining particular attention to the state of the bowels, which ought to be kept gently open for some time, even after the disorder seems to be gone off, till the patient be quite out of danger.

So much for the simple treatment: we now proceed to the second part, where he describes the method of practice when the disease is in its more irregular and complicated state.

When a diarrhoea accompanies the disease, he observes that it ought by no means to be checked, but supported, by ordering the patient to drink plentifully of mild aperient liquors. If the pain of the hypogastric region be attended with stitches in the sides or over the pit of the stomach, and a pulse that resists the finger pretty strongly, he remarks that bleeding would then be highly necessary: declaring, however, his opinion, that, in the purperal fever, bleeding is to be considered only as a secondary means of relief, though the first in point of time; that it ought to be advised with great caution; and that the greatest dependence is always to be placed upon evacuations by stool.

Mr White, abovementioned, imputes the purperal fever to a putrescent disposition of the humours, contracted during pregnancy, and fomented by the hot regimen commonly used by women in child-bed. In conformity to this opinion, the chief means which he recommends for preventing the disease is a cool regimen and free circulation of air, which he evinces to be of the greatest importance. In respect of bleeding, he informs us, that, upon the strictest inquiry, he cannot find that those who have bled the most copiously have had the greatest success, either in private or hospital practice. He even seems to question the propriety of this evacuation in any case; but approves of emetics, cathartics, and clysters, for cleansing the *primæ viæ*, and likewise of such medicines and diet as will correct the putrid humours: adding, that an upright posture and free ventilation are at all times useful, and absolutely necessary, both for the prevention and cure of the disease.

The next writer that treats of the child-bed fever is Dr Leake, who made observations on this disease in the interval from April 1768 to the autumn of the year 1770; but chiefly from December 1769 to May 1770, during which period the child-bed fever prevailed much about London.

Dr Leake tells us that this fever generally commenced the evening of the second, or morning of the third

day after delivery, with a rigor, or shivering fit. Sometimes it invaded soon after delivery; and at other times, though rarely, it has seized so late as the fifth or sixth day. Now and then it seemed to be occasioned by catching cold, or by errors in diet; but oftener by anxiety of mind. Sometimes the thirst was great; tho' the tongue had, in general, a better appearance at the beginning than is common in other fevers. It was seldom ever black or very foul; but, as the disease advanced, became white and dry, with an increase of thirst; and at last was of a brownish colour towards the root, where it was slightly covered with an inspissated mucus. The loss of strength was so great and sudden, that few of the patients could turn in bed without assistance, even so early as the first or second day after the attack. The lochia, from first to last, were not obstructed, nor deficient in quantity; neither did the quality of this discharge seem to be in the least altered from its natural state; a presumption, says the author, that the uterus was not at all affected. Of this he was convinced by making a considerable pressure above the pubes with the hand, which did not occasion pain; but when the same degree of pressure was applied higher, between the stomach and umbilical region, it became almost intolerable. A perfect crisis seldom ever happened in this fever, which he imputes to the great oppression of the vital powers, whereby they were rendered unable to produce such an event. When the disease proved mortal, the patient generally died on the 10th or 11th day from the first attack. In those who died of the fever, the omentum was found suppurated; an inflammation of which part, or of the intestines, Dr Leake concludes to be the proximate cause of the disease.

In consequence of this idea of the cause of the disease, Dr Leake affirms that venesection is the only remedy which can give the patient a chance for life. But, tho' it is the principal resource to be depended upon at the beginning of the fever, he observes that it will seldom prove of service after the second or third day; and, if directed yet later, will only weaken and exhaust the patient; when, matter having begun to form in the omentum, the progress of the disease can no longer be prevented by that evacuation. At this period the blood begins to be tainted by the absorption of the purulent fluid; and the fever, from being inflammatory, is changed into a putrid nature.

After bleeding in such a quantity as the symptoms require, he advises that the corrupted bile be evacuated and corrected as soon as possible; that the diarrhoea, when excessive, be restrained by emollient anodyne clysters and gentle sudorifics, or even by opiates and mild astringents, when the patient's strength begins to sink under the discharge; and, lastly, that where the signs of the putrefaction or intermission take place, antiseptics and the Peruvian bark may be administered.

The great uniformity of the symptoms in all Dr Leake's patients might authorize an opinion, that the fever which he describes was in a great measure a disease *sui generis*, and depended much upon the constitution of the air preceding and during the period in which the fever prevailed.

Dr Kirkland has also made judicious observations on this subject. He rejects the opinion that the putre-

ral fever is a disease *sui generis*, and arises always from the same cause. The particular situation of child-bed women, he acknowledges, occasions a similarity in the appearance of all the febrile symptoms: but he affirms that the same kind of fever may be produced by various causes; for instance, by an inflammation of the uterus or abdomen, by putrid blood or other matter, and putrid miasms. The symptoms, he observes, will vary according to the time of seizure. If the fever happens in three or four days after delivery, all the symptoms usual to the situation of the patient will make their appearance; but if it does not invade till the milk has been secreted, and the lochial discharge is nearly finished, the symptoms, if the breasts are properly drawn, will, for the most part, be those only which are common to that kind of disorder by which the fever has been produced.

With respect to the cure of puerperal fevers, Dr Kirkland advises the antiphlogistic method when they arise from inflammation; but when this method fails of success, and a diarrhoea supervenes, the disease has changed its nature, having become more or less putrid, and requires a very different treatment.

His observations relative to the management of the diarrhoea are extremely judicious. No one, says he, would purge and bleed to cure the colliquative fever arising from the absorption of matter in large wounds; and yet the only difference is, that in the puerperal fever the matter absorbed from the uterus, &c. acts with more violence, because the blood is commonly thinner and the habit in a more irritable state. We see, continues he, that absorbed matter purges as effectually as if any purging medicine had been given by the mouth; and may we not therefore do harm by additional purging, when there has been a large evacuation, especially as purges in this case are incapable of entirely removing the *fomes morbi*?

He considers the Peruvian bark as the principal remedy, as soon as the pulse sinks, the heat is lessened, and the stomach will bear it. If the bark increases the diarrhoea beyond moderation, he joins with it small doses of laudanum; but if the diarrhoea were entirely to stop without the fever going off, in place of laudanum he advises a proper quantity of rhubarb. Should the diarrhoea, notwithstanding the use of the medicines proposed, become so violent as to endanger the patient, he joins Mr White in recommending the columbo root, which is a warm cordial, and removes the irritability of the stomach and intestines more powerfully than any other bitter he knows.

Of this disease also, as it appears in Derbyshire and some of the adjacent provinces, an account has been published by Dr Butter. Concerning the causes and nature of the disease, he observes, that pregnancy seems to add much to the natural sensibility of the female constitution; because at this period women are often subject to a train of nervous symptoms, which never molest them at other times. During gestation, likewise, the appetite is for the most part keen, while the digestion appears to be impaired; and this weakness is increased not only by improper food, of which the woman is frequently desirous, but also by the inactivity attending her situation. To these circumstances, it is added, that the intestinal passage being interrupted by the uterine pressure, coliciveness generally

prevails. From the several observations here enumerated, Dr Butter concludes, that the proximate cause of the puerperal fever is a spasmodic affection of the first passages, with a morbid accumulation in their cavity; and upon this supposition he endeavours to account for the various symptoms of the disease.

In treating of the method of cure, the author lays down two indications; the former of which is to promote two, three, or four stools daily, in a manner suited to the strength of the patient, till such time as they resume a natural appearance. The second indication is to relieve all uneasy symptoms, such as heat, thirst, head-ach, &c.

With respect to the opinion entertained by Dr Butter of the cause of the puerperal fever, it nearly coincides with that of Mr White. But however plausible it may appear, we are not entirely satisfied that a disease attended with so peculiar symptoms as the puerperal-fever can depend principally upon an irritability, which is not restricted either to the pregnant or puerperal state.

It deserves to be remarked, that though the several writers who treat of this subject have conducted their method of cure conformably to their particular idea of the cause of the disease, respecting which their sentiments are very different, they seem to have been equally successful in the treatment of their patients. Indeed the several writers differ less from each other in their method of cure, than might be expected where so great an opposition of theoretical sentiments prevails. For after endeavouring to establish indications correspondent to their particular systems, those who contend for the expediency of promoting the intestinal discharge, dissuade not from a recourse to phlebotomy when the disease is attended with inflammatory symptoms; while, on the other hand, the most strenuous advocates for bleeding admit the utility of the former evacuation. It appears, therefore, that a due regulation of the alvine discharge is necessary through the whole course of the fever, but venesection only sometimes.

#### CCXVIII. CEPHALALGIA, the HEAD-ACH.

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THIS headach is symptomatic of very many dilemmas, but is rarely an original disease itself. Dr Home acquaints us that his report-books only furnish four instances of it; and of these four, three were women. The disease proved fatal to the man; and after death, a considerable effusion of blood was found on the brain, together with some hydatids, and water in the ventricles.

Headachs appear frequently to be occasioned by effusions of blood and serum; as well as by ulcers, and abscesses of the brain, dura and pia mater. Accretions and ossifications of different parts of the dura mater, falx, and brain, are also frequently discovered. An ossification of the falx, however, does not always produce headach: for Dr Home mentions a patient who had the falx ossified without headach; but he had been observed to be very furious when drunk. Congestions of blood in the vessels of the brain are also discovered from dissections to be a frequent cause of the headach; and nervous irritation alone will frequently produce it, as we see in the *clavus hystericus*.

In the cure of this disease we have little or no power over ossifications, effusions, or ulcerations; and hence

the headach is frequently incurable. In congestions, and nervous affections, medicines may indeed be of some service. Congestion may be relieved by an evacuation of blood, either general or topical; as venesection, cupping, or leeches: by errhines; which, however, Dr Home thinks are little to be depended upon: by topical evacuations near the head by blisters, issues, or setons; by purgatives; or by determining the fluids to other parts, by rubefacients applied to the temples, pediluvia, &c.

Nervous irritation may be diminished, 1. By a great quantity of cold water drunk every morning. This is recommended by Hoffman; and will wash off all acrid particles from the stomach, while the cold strengthens and diminishes the sensibility of the part. This remedy was tried for a considerable time in one of Dr Home's patients, without any effect. 2. Nervous and tonic medicines; as the bark, valerian, &c. These were tried in two of Dr Home's patients, but also without success. In a third the valerian succeeded. 3. By cold water applied to the head, immersion, or the shower-bath. 4. Cacophæ of cephalics; as lavender, rosemary, &c. In slight cases, the smell of eau de luce, or any strong volatile alkali, will generally prove a cure.

#### CCXIX. *A Dangerous Affection of the OESOPHAGUS.*

THIS distemper has only been treated of by Dr Munkley, who reckons it one of the most deplorable diseases of the human body. Its beginning is in general so slight as to be scarce worth notice, the patients perceiving only a small impediment to the swallowing of solid food: they usually continue in this state for many months; during which, all liquid foods, and even solids themselves, when cut small and swallowed leisurely, are got down without much difficulty: by degrees the evil increases, and the passage through the œsophagus becomes so narrow, that not the smallest solid whatever can pass through it; but, after having been detained for some time at the part where the obstacle is formed, is returned again with a hollow noise of a very peculiar kind, and with the appearance of convulsion.

The seat of this malady is sometimes near the top of the œsophagus, and at other times farther down, nearer the superior orifice of the stomach. In this last case, the part of the alimentary tube which is above the obstruction, is frequently so dilated by the food which is detained in it as to be capable of containing a large quantity; and the kind of vomiting, by which it is again returned through the mouth, comes on sooner or later after the attempt to swallow, in proportion to the nearness or remoteness of the part affected. In the last stage of this disease, not even liquids themselves can be swallowed so as to pass into the stomach, and the patient dies literally starved to death.

On the dissection of such as have died in this manner, the œsophagus is found to be considerably thickened; and in some so contracted within at the diseased part, as scarcely to admit the passing of a common probe; in others, to adhere together in such a manner as entirely to close up the passage, and not to be separated without great difficulty.

He comes next to shew what he has found to be the

most efficacious method of treating this disease, which, though not uncommon, yet in general has been considered as incurable.

He claims not the merit of having discovered the method of cure, but hopes that some service may arise from publishing what his experience has confirmed to him; having first received the hint from another eminent physician.

The only medicine, then, from the use of which he has ever found any service, is mercury; and in cases which are recent, and where the symptoms have not risen to any great height, small doses of mercury given every night, and prevented, by purgative medicines, from affecting the mouth, have accomplished the cure.

But where the complaint has been of long standing, and the symptom has come on of the food's being returned through the mouth, a more powerful method of treatment becomes necessary. In this case he has never found any thing of the least avail in removing any of the symptoms, but mercury, used in a such a manner as to raise a gentle, but constant spitting; and this method he has pursued with the happiest success. If this method be commenced before the complaint has gained too much ground upon the constitution, the case is not to be despaired of; and of those who have come under his care in this state, by much the greater part have received considerable benefit from it, and many been entirely cured.

The complaint itself, he observes, is not very uncommon; but there is no instance, to his knowledge, recorded, of success from any other manner of treating it, than that he has recommended.

#### CCXX. WORMS.

THOSE infesting the human body are chiefly of three kinds: the *ascarides*, or round and short white worm; the *terres*, or round and long worm; and the *tania*, or tape-worm.

The *ascarides* have usually their seat in the rectum. —The round worms are about a span long, round and smooth: they are seated for the most part in the upper small intestines; but sometimes they are lodged also in the stomach, and in any part of the intestines, even to the rectum. —The tape-worms are from two to forty feet long, according to the testimony of Platerus; they generally possess the whole tract of the intestines, but especially the ileum: they very much resemble a tape in their appearance, whence the name of *tape-worm*.

In the Medical Transactions, Vol. I. Dr Heberden gives a very accurate account of the symptoms produced by the *ascarides*, from an eminent physician who was troubled with them all his life. They brought on an uneasiness in the rectum, and an almost intolerable itching in the anus; which sensations most usually came on in the evening, and prevented sleep for several hours. They were attended with heat, sometimes so considerable as to produce a swelling in the rectum both internally and externally; and if these symptoms were not soon relieved, a tenesmus was brought on, with a mucous dejection. Sometimes there was a gripping pain in the lower part of the abdomen, a little above the *os pubis*. If this pain was very severe, a bloody mucus followed, in which there were often found *ascarides* alive. They were also sometimes suspected



PRACTICE of occasioning disturbed sleep, and some degree of headach.

On this case Dr Heberden observes, that the general health of the patient did not seem to have suffered from the long continuance of the disease, nor the immediate inconveniences of the disorder itself to have increased. "It is, (says he), perhaps universally true, that this kind of worms, though as difficult to be cured as any, yet is the least dangerous of all. They have been known to accompany a person through the whole of a long life, without any reason to suspect that they had hastened its end. As in this case there was no remarkable sickness, indigestion, giddiness, pain of the stomach, nor itching of the nose, possibly these symptoms where they have happened to be joined with the ascariides did not properly belong to them, but arose from some other causes. There is indeed no one sign of these worms, but what in some patients will be wanting."

The abovementioned patient used purging and irritating clysters with very little success. One drachm and an half of tobacco was infused in six ounces of boiling water; and the strained liquor being given as a clyster, occasioned a violent pain in the lower part of the abdomen, with faintness and a cold sweat: this injection, though retained only one minute, acted as a smart purge, but did little or no good. Lime-water was also used as a clyster; which brought on a coliciveness, but had no good effect. Six grains of salt of steel were dissolved in six ounces of water, and injected. This clyster in a few minutes occasioned an aching in the rectum, griped a little without purging, and excited a tenesmus. Some few ascariides were brought off with it; but all of them were alive. The uneasy sensation in the rectum did not abate till some warm milk was thrown up. Whenever the tenesmus or mucous stools were thought worth the taking notice of, warm milk and oil generally gave immediate relief. If purging was necessary, the lenient purges, such as manna with oil, were, in this particular case, made use of: rhubarb was found too stimulating.—But, in general, the most useful purge, and which therefore was most usually taken, was cinnabar and rhubarb, of each half a drachm: this powder seldom failed to bring away a mucus as transparent as the white of an egg, and in this many ascariides were moving about. The cinnabar frequently adhered to this mucus, which did not come off in large quantities when a purge was taken without cinnabar. Calomel did no more than any other purge which operates briskly would have done; that is, it brought away ascariides, with a great deal of mucus. Oil given as a clyster sometimes brought off these animalcules: the oil swam on the surface of the mucus, and the ascariides were alive and moving in the mucus itself, which probably hindered the oil from coming in contact with them and killing them.

The Doctor also observes, that mucus or slime is the proper nest of the ascariides, in which they live, and is perhaps the food by which they are nourished; and it is this mucus which preserves them unhurt, though surrounded with many other liquors the immediate touch of which would be fatal. It is hard to satisfy ourselves by what instinct they find it out in the human body, and by what means they get at it;

but it is observable in many other parts of nature, as well as here, that where there is a fit soil for the hatching and growth of animals and vegetables, nature has taken sufficient care that their feeds should find the way thither. Worms are said to have been found in the intestines of infants born dead. Purges, by lessening this slime, never fail to relieve the patient: and it is not unlikely, that the worms which are not forced away by this quickened motion of the intestines, may, for want of a proper quantity of it, languish, and at last die; for if the ascariides are taken out of their mucus, and exposed to the open air, they become motionless, and apparently die in a very short time. Dr Heberden supposes that the kind of purge made use of is of little consequence in the cure of all other worms as well as ascariides; the insects being always defended by the mucus from the immediate action of medicines; and that therefore those purges are the best which act briskly, and of which a repetition can be most easily born. Purging waters are of this sort, and jalap especially for children; two or more grains of which, mixed with sugar, are most easily taken, and may be repeated daily.

From the case above-mentioned, and from Dr Heberden's observations, we may easily see why it is so difficult to destroy these insects; and why anthelmintics, greatly celebrated for some cures, are yet so far from being specifics in the disease. As the worms which reside in the cavities of the human body are never exposed to the air, by which all living creatures are invigorated it is evident, that in themselves they must be the most tender and easily destructible creatures imaginable, and much less will be requisite to kill them than any of our common insects. The most pernicious substances to any of the common insects are oil, caustic fixed alkali, lime, and lime-water. The oil operates upon them by shutting up the pores of their bodies; the lime-water, lime, and caustic alkali, by dissolving their very substance. In the case of intestinal worms, however, the oil can have very little effect upon them, as they are defended from it by the moisture and mucus of the intestines; the like happens with lime-water: and therefore it is necessary that the medicine should be of such a nature as to destroy both mucus and insects together; for which purpose the caustic fixed alkali is at once safe and efficacious, nor is it probable that any case of worms whatever could resist the proper use of this medicine. A very large dose of any salt indeed will also destroy the mucus, and destroy the worms; but it is apt to inflame and excoriate the stomach and intestines, and thus to produce worse distempers than that which it was intended to cure. Dr Heberden gives the following remarkable case of a patient cured of worms by enormous doses of common salt, after trying many other remedies in vain. In February 1757, the patient was seized with uncommon pains in his stomach, attended with nausea, vomiting, constipation of his bowels, and an almost total loss of sleep and appetite: He soon became greatly emaciated, and could neither stand nor walk upright; his belly grew small and hard, and closely retracted, inasmuch that the sternum covered the navel, and the latter could scarce be discovered or felt by the finger: his urine was always milky, and soon deposited a thick white sediment; his excrements

PRACTICE excrements were very hard and lumpy, resembling those of sheep, only of a brown colour; nor had he ever a stool without some medicine or other to procure it. In this situation he continued four years; during which time he had been in an infirmary, attended by eminent physicians, but was dismissed as incurable. At last he was advised by a neighbour to drink salt and water, as he said he knew one cured by it who had for many years been afflicted with the same kind of pains in the belly and stomach. As his distemper was now almost insupportable, he willingly tried the experiment. Two pounds of common salt were dissolved in as little water as possible, all which he drank in less than an hour. Soon afterwards he found himself greatly oppressed at his stomach, grew extremely sick, and vomited violently; on the fourth straining he brought up about half a pint of small worms, part ascarides, and the rest resembling those worms which are called the *botts*, and frequently met with in the stomach of horses, but much smaller, and about the size of a grain of wheat. The salt soon began to operate downwards, and he had five or six very copious fetid stools tinged with blood; and in them discharged near an equal quantity of the same kind of worms he had vomited. Being greatly fatigued with the violence of the operations, he fell into a calm sleep, which lasted two hours, during which he sweated profusely, and awoke much refreshed. Instead of his usual pains, he now only complained of a rawness and soreness of his gullet, stomach, and bowels, with an almost unquenchable thirst; to allay which, he drank large quantities of cold water, whey, butter-milk, or whatever he could get. The urine he now passed was small in quantity, and rendered with very great difficulty, being highly saturated with the salt, from whence arose a most troublesome dysuria and strangury. However, these symptoms gradually abated by a free use of the liquors above-mentioned; and on the third morning he was so well recovered, that he took two pounds more of salt, dissolved in the like quantity of water. The effects were nearly similar to the former; only that most of the worms were now burst, and came away with a considerable quantity of slime and mucus. The drought, strangury, &c. returned with their former violence; but soon yielded to the old treatment. He sweated very copiously for three days, slept easily, and by that time could extend his body freely: on the fifth day he left his bed, and, though very weak, could walk upright; his strength and appetite soon returned, and he became robust and well.

The anthelmintic medicines which have been recommended by one person or other, are in a manner innumerable; but the principal are,

1. *Quicksilver*. This is very efficacious in all kinds of worms, either taken in the form of calomel, corrosive sublimate, or even the crude metal boiled in water and the water drunk. There can be no possible objection to it, but only that it is not endowed with any attenuating quality whereby the mucus in which these insects reside can be dissolved. It therefore fails in many cases, though it will most certainly destroy worms where it can get at them.

2. *Powder of tin*. This was for some time celebrated as a specific, and indeed we may reasonably

expect good effects from it; as by its weight and gritty-ness it rubs off the mucus and worms it contains from the coats of the intestinal canal, in which case they are easily evacuated by purgatives. In order to produce any considerable effects, it must be given in a large dose.

3. *Cabbage-tree bark*. This remedy is used by the inhabitants of Jamaica. The first account of it which appeared in this country was published in the *Physical and Literary Essays*, vol. ii. by Mr Duguid surgeon in that island. He acquaints us that the inhabitants of Jamaica, young and old, white and black, are much infested with worms, especially the long round sort; the reason of which, he thinks, is the quantity of sweet viscid vegetables which they eat. On dissecting a child of seven months old, who died of vomiting and convulsions, twelve large worms were found; one of them filled the *appendix vermiformis*, and three of them were entwined in such a manner as to block up the *valvula Tulpii*, so that nothing could pass from the small to the great guts.—The bark of the cabbage-tree, however, he tells us is a safe and effectual remedy, and the most powerful vermifuge yet known; and that it frequently brings away as many worms by stool as would fill a large hat. He owns that it has sometimes violent effects; but this he ascribes to the negroes who make the decoction, (in which form the bark is used), and not to the remedy itself.

Mr Anderson, surgeon in Edinburgh, hath also given an account of this bark and its operation, in a letter to Dr Duncan, *Med. Com.* volume iv. p. 84. From this account it appears, that there are two different kinds of bark; the one much paler than the other: the pale kind operates much more violent than the other. It often occasions loose stools, great nausea, and such like symptoms, attended with great uneasiness in the belly: in one or two instances it was suspected of inducing syncope. The darker coloured kind resembles the cassia lignea, though it is of a much coarser texture. This kind, Mr Anderson thinks, may be exhibited in any case where an anthelmintic is necessary; the dangerous symptoms might have followed either from the use of the first kind, or from an over-dose. The usual method of preparing the medicine is by boiling two ounces and a half of the bark in two quarts of water to a pint and a half. Of this a tea-spoonful may be given at first in the morning, gradually increasing the quantity till we come to four or five table-spoonfuls in a day. When exhibited in this manner, Mr Anderson informs us, that he never saw it produce any violent symptoms, and has experienced the best effects from it as an anthelmintic. After the use of this decoction for eight or nine mornings successively, a dose of jalap with calomel must be given, which seldom fails to bring away the worms, some dead, some alive. If at any time the decoction produced more than one or two loose stools, a few drops of liquid laudanum may be given; and, in general, Mr Anderson gave fifteen or twenty drops of the spirit of lavender with each dose.

In a letter from Dr Rush, professor of chemistry at Philadelphia, to Dr Duncan of Edinburgh, the following account is given of another preparation of this medicine. "It has long (says he) been a complaint

plaint among physicians, that we have no *vermifuge* medicine which can be depended up. Even calomel fails in many cafes where there are the moft pathognomonic figns of worms in the bowels. But this complaint, it is hoped, is now at an end. The phyficians of Jamaica have lately found, that the bark of the fummits of the cabbage-tree, made into a fyrup with brown fugar, is an infallible antidote to them. I have ufed above 30 pounds of it, and have never found it fail in one inftance. The fyrup is pleafant; it fometimes pukes, and always purges, the firft or fecond time it is given."

Notwithstanding thefe encomiums, however, the cabbage-tree bark hath not come into general ufe; fo that we can only look upon it as a drafic purgative, the effects of which muft neceffarily be as precarious as thofe of others.

4. *Cowhage, or cow-itch.* This is the *Dolichos urens* or *pruriens* of Linnaeus; and the principles on which it acts have been already explained under the article *DOLICHOS*. It is fomewhat fimilar to the powder of tin, but bids fair for being more efficacious. The only objection to its ufe is, that by the hairs of it entangling themfelves with one another, calculi might be formed in the inteftines, or obftructions equally bad; or if the fharp points and hooks with which it abounds were to adhere to the nervous coats of the inteftines themfelves, they might occafion a fatal irritation, which could not be removed by any means whatever.

5. *Indian pink.* This is alfo an American plant, and was firft recommended in the Edinburgh Phyfical and Literary Effays by Dr Garden of Charlestown in South Carolina. He is of opinion that a vomit ought always to precede the ufe of it; and informs us, that half a drachm of it purges as briskly as the fame quantity of rhubarb. At other times he has known it produce no effect on the belly though given in very large quantity: In fuch cafes it becomes neceffary to add a grain or two of fweet mercury, or fome grains of rhubarb; but then it is lefs efficacious than when it proves purgative without addition. This ufe of it, however, in fmall dofes, is by no means fafe; as it frequently produces giddinefs, dimnefs of fight, convulfions, &c. The addition of a purgative, indeed, prevents thefe effects; but at the fame time, as already obferved, it diminifhes the virtue of the medicine. The doftor therefore recommends large dofes, as from them he never knew any other effect than the medicine's proving emetic or violently cathartic. The dofe is from 12 to 60 or 70 grains of the root in fubftance, or two, three, or four drachms of the infufion, twice a-day.

This medicine hath alfo had its day, and is now very far from being confidered as a fpecific. From what hath been already obferved, it muft pretty clearly appear, that powder of tin, cow-itch, or fixed alkaline falts, bid faireft for deftroying worms in all the variety of cafes in which they can occur. Alkalies indeed have been but little tried. We have known one cafe in which all the complaints have been removed by a fingle dofe: we have alfo an inftance of their efficacy, in an extraordinary cafe of a worm bred in the liver, mentioned in the 2d volume of the Medical Obfervations. The patient

had a violent pain in the fide, and fometimes in the fhoulder, as the worm fhifted its place; but, on the application of a lixivial poultice, the pain went out of the fide entirely, and kept in the fhoulder for fome weeks; and had a fimilar poultice been applied there, it is probable the animal would have died.

The long round worms feem to be the moft dangerous which infect the human body, as they often pierce through the ftomach and inteftines, and thus bring on a miferable death. The common fymptoms of them are naufea, vomiting, loofenefs, fainting, flender intermitting pulfe, itching of the nofe, and epileptic fits. By the confumption of the chyle they produce hunger, palenefs, weaknefs, coftivenefs, tumour of the abdomen, eructations, and rumbling of the inteftines; but it is from the perforation of the inteftines that the difeafe proves fo frequently fatal. A child may be known to have worms, from his cold temperament, palenefs of the countenance, livid eye-lids, hollow eyes, itching of the nofe, voracity, flatulencies, and grinding of the teeth in fleep; and more efpecially by a very fetid breath. Very frequently, however, they are voided by the mouth and anus, in which cafe there is no room for doubt. In the Medical Commentaries, Vol. II. we have an account of the inteftines being perforated by a worm, and yet the patient recovered. The patient was a woman troubled with an inflammation in the lower part of the abdomen. The pain was fo violent, that for fix days fhe fleep none at all; the tumour then broke, difcharged upwards of a pound of thin watery fanies, immediately after which the excrements followed. The next day fhe was extremely low; her pulfe could fcarcely be felt; the extremities were cold; and there was a confiderable difcharge from the wound, which had already begun to mortify. She got a decoction of the bark with wine, which alleviated the fymptoms; but in removing the mortified parts a worm was found among them nine inches long, and as thick as an eagle's quill. By proper applications, the difcharge of excrements ceafed, and the recovered perfect health. She was fenfible of no accident giving rife to the inflammation; fo that in all probability it arofe entirely from the worm itfelf.

The *tania*, or *tapeworm*, as it is called, is one of thofe moft difficult to be cured. It is of two kinds, *tania folium* and *tania lata*; for a description of which, fee the article *TANIA*. The reafon of its being fo difficult to cure, is, that though portions of it are apt to break off and be difcharged, it is endowed with a power of reproduction, fo that the patient is little or nothing better. The fymptoms occafioned by it are not different from thofe above defcribed. A fpecific againft the *tania lata* hath been lately fo much celebrated in France, that the king thought proper to purchafe it from the proprietor (Madam Nouffer), and the account of it hath been tranflated into Englifh by Dr Simmons. The patients are required to obferve no particular regimen till the day before they take the fpecific. That day they are to take nothing after dinner till about 7 o'clock; after which, they are to take the following foup: "Take a pint and an half of water, two or three ounces of good frefh-butter, and two ounces of bread cut into thin flices: add to this, falt enough to feafon it, and

then



then boil it to the consistence of panada." About a quarter of an hour after this, they take a biscuit and a glass of white-wine, either pure or mixed with water; or even water alone, if they have not been accustomed to wine. If the patient has not been to stool that day, (which, however, is not usual with patients in this way), the following clyster is to be injected. "Take a small quantity of the leaves of mallows, and boil them in a sufficient quantity of water, mixing with it a little salt, and when strained off add two ounces of oil olive." Next morning, about eight or nine hours after the supper abovementioned, the specific is to be taken. This is no other than two or three drachms of the root of male fern gathered in autumn, and reduced to fine powder. It is to be taken in any distilled water, or in common water. This medicine is apt to occasion a nausea: to avoid which, Madame Nouffer allows her patients to chew any thing that is agreeable, but forbids any thing to be swallowed; or they may smell to vinegar, to check the sickness: but if, notwithstanding this, the specific is thrown up, a fresh dose must be swallowed as soon as the sickness is gone off, and then they must try to sleep. About two hours after this the following bolus is to be taken. "Take of the pancrea of mercury 14 times sublimed, and select resin of scammony, each ten grains; of fresh and good gamboge, six or seven grains: reduce each of these substances separately into powder, and then mix them with some conserve into a bolus." This composition is to be swallowed at two different times, washing it down with one or two dishes of weak green-tea, after which the patient must walk about his chamber. When the bolus begins to operate, he is to take a dish of the same tea occasionally, until the worm is expelled; then, and not before, Madame Nouffer gives him broth or soup, and he is directed to dine as is usual after taking physic. After dinner he may either lie down or walk out, taking care to conduct himself discreetly, to eat but little supper, and to avoid every thing that is not of easy digestion.

The cure then is complete; but it is not always effected with the same quickness in every subject. He who has not kept down the whole bolus, or who is not sufficiently purged by it, ought to take, four hours after it, from two to eight drachms of Epsom salt dissolved in boiling water. The dose of this salt may be varied according to the temperament and other circumstances of the patient.

If the worm should not come away in a bundle, but in the form of a thread (which particularly happens when the worm is involved in much tenacious mucus), the patient must continue to sit upon the close-stool without attempting to draw it away, drinking at the same time warm weak tea: sometimes this alone is not sufficient, and the patient is obliged to take another dose of purging salt, but without varying his position till the worm is wholly expelled.

It is unusual for patients who have kept down both the specific and purging dose, not to discharge the worm before dinner-time. This, however, sometimes happens when the dead worm remains in large bundles in the intestines, so that the fæces becoming more limpid towards the end of the purging, pass by it without drawing it with them. The patient may in this case eat his dinner; and it has been observed, that

the food, joined to the use of a clyster, has brought about the expulsion of the worm.

Sometimes the worm is brought away by the action of the specific alone, before the patient has taken the purging bolus: when this happens, Madame Nouffer gives only two thirds of it, or substitutes the salt in its stead.

Patients must not be alarmed by any sensation of heat or uneasiness they may feel during the action of the remedy, either before or after a copious evacuation, or just as they are about to void the worm. These sensations are transitory, and go off of their own accord, or by the assistance of the vapour of vinegar drawn in at the nose.

They who have vomited both the specific and bolus, or who have kept down only a part of them, sometimes do not void the worm that day. Madame Nouffer therefore directs them to take again that night the soup, the wine and biscuit, and if circumstances require it the clyster. If the worm does not come away during the night, she gives them early the next morning another dose of the specific, and, two hours afterwards, six drachms or an ounce of purging salt, repeating the whole process of the preceding day; excepting the bolus, which she suppresses.

She observes, that very hot weather diminishes in some degree the action of her remedy; she therefore prefers the month of September for administering it: but as she has not been always able to choose the season, and has been sometimes obliged to undertake the care of patients in the hottest days of summer, she then gave her specific very early in the morning; and with this precaution she saw no difference in its effects.

On the day appointed for the trial of this medicine, it was exhibited to five different persons; but only one of them was certainly known to have the *tenia lata* by having discharged parts of it before. That person was cured; the second voided a portion of the *tenia folium*; the third some *ascarides*, with a part of the *tenia folium*; the fourth and fifth voided no worms; but the last considered much of the viscid slime he voided to be worms in a dissolved state.

This trial was thought sufficient to ascertain the efficacy of the medicine, and further trials were made by those to whom the secret was communicated. The first voided two *tenia*, after much vomiting and 18 or 20 stools; the second had no vomiting, but was as violently purged, and discharged two worms; the third had 20 copious stools during the night, and discharged the worm in the morning; and the fifth was effected in much the same manner. Some others who were not relieved, were supposed not to have a *tenia*.

This specific, however, is not to be considered as a new discovery; the efficacy of fern in cases of *tenia* having been known long ago. Theophrastus prescribes its root, in doses of four drams, given in water sweetened with honey, as useful in expelling flat worms. Dioscorides orders it in the same dose, and adds, that its effects are more certain when it is mixed with four oboli (40 grains) of scammony or black hellebore; he particularly requires that garlic should be taken before-hand. Pliny, Galen, Oribasius, and Aëtius, ascribe this same virtue to fern; and are followed in this by Avicenna, and the other Arabian physicians. Dornienius,

tenius, Valerius Cordus, Dodonæus, Mathiolus, Dalechampi, who commented on Dioscorides, or copied him in many things, all mention the fern-root as a specific against the tænia. Sennertus, and Burnet after him, recommended in similar cases an infusion of this plant, or a dram of its powder for young persons, and three drams for adults. Simon Paulus, quoted by Ray and Geoffroy, considers it as the most efficacious of all poisons against the flat worm, and as being the basis of all the secret remedies extolled by empirics in that disease. Andry (*général des Vers*, p. 246, 249) prefers distilled fern-water to the root in powder, or he employs it only in the form of an opiate, or mixed with other substances.

These are not the only authors who have mentioned the tænia; many others have described this worm, the symptoms it excites, and the treatment proper to expel it. Almost all of them mention the fern-root, but at the same time they point out other remedies as possessing equal efficacy. Amongst these we find the bark of the root of the mulberry-tree, the juice of the *aricula muris*, the roots of *chameleon niger*, ginger, zedoary; decoctions of mugwort, southernwood, wormwood, penny-royal, origanum, hyssop, and in general of all bitter and aromatic plants, &c. Some of them direct the specific to be simply mixed and taken in wine or honey and water; others join to it the use of some purgative remedy, which they say adds to its efficacy. Oribasius, Sylvius, &c. distinguish the specific that kills the worm, from the purgative that evacuates it, and direct them to be given at different times. Sennertus gives a very satisfactory reason for adopting this method. If we give, says he, the purgative medicine and the specific at the same time, the latter will be hastily carried off before it can have exerted its powers on the worm: whereas, if we give the specific first, and thus weaken the worm, it will collect itself into a bundle, and, being brought away by means of the purge, the patient will be cured. The cure will be more speedy if the *prime viæ* have been previously lubricated. These precautions are all of them essential to the success of the remedy, nor are they neglected by Madame Nouffer in her method of treatment. The panada and injection she prescribes the night before, to lubricate the intestines, and prepare the *prime viæ*. The fern-root taken in the morning, kills and detaches the worm: of this the patients are sensible by the cessation of the pain in the stomach, and by the weight that is felt in the lower belly. The purgative bolus administered two hours after this, procures a complete evacuation; it is composed of substances that are at once purgative and vermifuge, and which, even when administered alone, by different physicians, sometimes succeeded in expelling the worm. If this purgative appear to be too strong, the reader is desired to recollect, that it produced no ill effects in either of the cases that came under the observation of the physicians appointed to make the trials; and that in one of those cases, by diminishing the dose, they evidently retarded the evacuations. Regard however, they observe, is to be had both to the age and the temperament of the patient, and the treatment should always be directed by a prudent and experienced physician, who may know how to vary the proportions of the dose as circumstances may require. If

the purgative is not of sufficient strength, the worm, after being detached by the specific, remains too long a time in the intestines, and becoming soon corrupted is brought away only in detached portions; on the other hand, if the purgative is too strong, it occasions too much irritation, and evacuations that cannot fail to be inconvenient.

Madame Nouffer's long experience has taught her to distinguish all these circumstances with singular adroitness.

This method of cure is, as we have seen, copied in a great measure from the ancients: it may be possible to produce the same effects by varying the remedies; but the manner of applying them is by no means indifferent: we shall be always more certain of success, if the intestines are previously evacuated, and if the specific is given some time before the purgative bolus. It is to this method that Madame Nouffer's constant success is attributed.

Her remedy has likewise some power over the *tænia solium*; but as the rings of this worm separate from each other more easily than those of the *tænia lata*, it is almost impossible for it to be expelled entire. It will be necessary therefore to repeat the treatment several times, till the patient ceases to void any portions of worms. It must likewise be repeated, if, after the expulsion of one *tænia solium*, another should be generated in the intestinal canal. This last case is so rare, that it has been supposed that no person can have more than one of these worms; and for this reason it has been named *solitary worm*, which being once removed, could never be renewed or replaced by a second: but experience has proved, that this notion is an ill founded prejudice, and we know that sometimes these worms succeed each other, and that sometimes many of them exist together. Two living tæniæ have frequently been expelled from the same patient. M. de Haen (*Rat. Med.* tom. viii. p. 157.) relates an instance of a woman who voided 18 tæniæ at once. In these cases the symptoms are usually more alarming; and the appetite becomes excessive, because these worms derive all their nourishment from the chyle. If too austere and ill-judged a regimen deprives them of this, they may be expected to attack even the membranes of the intestines themselves. This evil is to be avoided by eating frequently.

Such are the precautions indicated in this disease. The ordinary vermifuge remedies commonly procured only a palliative cure, perhaps because they were too often improperly administered. But the efficacy of the present remedy, in the opinion of the French physicians, seem to be sufficiently confirmed by experience. To the above account, however, it seems proper to subjoin the following observations by Dr Simmons.

"A Swiss physician, of the name of *Herrenschwand*, more than 20 years ago, acquired no little celebrity by distributing a composition of which he styled himself the *inventor*, and which was probably of the same nature as Madame Nouffer's. Several very eminent men, as Tronchin, Hovius, Bonnet, Cramer, and others, have written concerning the effects of this remedy. It seems that Dr Herrenschwand used to give a powder by way of preparation, the night before he administered his specific. Nothing could be said with

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certainly concerning the composition either of one or the other. The treatment was said sometimes to produce most violent effects, and to leave the patients in a valetudinary state. Dr De Haen was dissuaded by his friends from using it, because it disordered the patients too much. It will be readily conceived, now that we are acquainted with Madame Nouffer's method, that these effects were occasioned wholly by the purgative bolus. It is not strange, that resin of scammony or jalap, combined with *mercurius dulcis* and gamboge, all of them in strong doses, should in many subjects occasion the greatest disorders. It seems likely, however, that much of the success of the remedy depends on the use of a drastic purge. Some of the ancients who were acquainted with the virtues of the fern-root, observed that its efficacy was increased by scammony. Reginous purges, especially when combined with mercury, have often been given with success in cases of *tania*. Dr De Haen saw a worm of this sort five ells long expelled by the resin of jalap alone. Dr Gaubius knew a woman who had taken a variety of antihelminthic remedies without any effect, though she had voided a portion of *tania* an ell and a half long, previous to the use of these medicines: but at length, after taking a purge of singular strength, she voided the worm entire. Many other instances of the same kind are to be met with in authors. Other remedies have occasionally been given with success. In Sweden, it has been a practice to drink several gallons of cold water, and then to take some drastic purge. Boerhaave says, that he himself saw a *tania* measuring 300 ells expelled from a Russian by means of the *vitriolum martis*. All these methods, however, have been too often ineffectual."

On the subject of worms, see further below, under the *Diseases of Children*.

#### OF POISONS.

THESE have all been treated of already, except the bites and stings of serpents, scorpions, &c. According to Dr Mead, the symptoms which follow the bite of a viper are, an acute pain in the place wounded, with a swelling, at first red, but afterwards livid, which by degrees spreads farther to the neighbouring parts; with great faintness, and a quick, low, and sometimes interrupted pulse; great sickness at stomach, with bilious convulsive vomitings, cold sweats, and sometimes pains about the navel. Frequently a sanious liquor runs from the small wound, and little pustules are raised about it: the colour of the whole skin, in less than an hour, is changed yellow, as if the patient had the jaundice. These symptoms are very frequently followed by death, especially if the climate is hot, and the animal of a large size. This is not, however, the case with all kinds of serpents. Some, we are assured, kill by a fatal sleep; others are said to produce an universal hæmorrhage and dissolution of the blood; and others an unquenchable thirst. But of all the species of serpents hitherto known, there is none whose bite is more expeditiously fatal than that of the rattle-snake. Dr Mead tells us, that the bite of a large serpent of this kind killed a dog in a quarter of a minute; and to the human species they are almost equally fatal. Of this serpent it is said, that the bite makes the person's skin become spotted all

over like the skin of the serpent; and that it has such a motion as if there were innumerable living serpents below it. But this is probably nothing more than a dissolution of the blood, by which the skin becomes spotted as in petechial fevers, at the same time that the muscles may be convulsed as in the distemper called *hieranosis*, which was formerly thought to be the effect of evil spirits.

It hath justly appeared surprising to philosophers, how such an inconsiderable quantity of matter as the poison emitted by a viper at the time of biting should produce such violent effects. But all inquiries into this matter must necessarily be uncertain; neither can they contribute any thing towards the cure. It is certain that the poison produces a gangrenous disposition of the part itself, and likewise seemingly of the rest of the body; and that the original quantity of poison continues some time before it exerts all its power on the patient, as it is known that removing part of the poisonous matter by suction will alleviate the symptoms. The indications of cure then are three. 1. To remove the poisonous matter from the body: Or, 2. If this cannot be done, to change its destructive nature by some powerful and penetrating application to the wound: And, 3. To counteract the effects of that portion already received into the system.

The poisonous matter can only be removed from the body by sucking the wound either by the mouth, or by means of a cupping-glass; but the former is probably the more efficacious, as the saliva will in some measure dilute and perhaps obtund the poison. Mead directs the person who sucks the wound to hold warm oil in his mouth, to prevent inflammation of the lips and tongue: but as bites of this kind are most likely to happen in the fields, and at a distance from houses, the want of oil ought by no means to retard the operation, as the delay of a few minutes might prove of the most fatal consequence; and it appears from Dr Mead's experiments, that the taking the poison of a viper into the mouth undiluted, is attended with no worse consequences than that of raising a slight inflammation. A quick excision of the part might also be of very great service.

The only way of answering the second indication is, by destroying the poisoned part by a red-hot iron, or the application of alkaline salts, which have the power of immediately altering the texture of all animal-substances to which they are applied, provided they are not covered by the skin; and as long as the poison is not totally absorbed into the system, these must certainly be of use.

To answer the third indication, Dr Mead recommends a vomit of ipecacuanha, encouraged in the working with oil and warm water. The good effects of this, he says, are owing to the shake which it gives to the nerves, whereby the irregular spasms into which their whole system might be drawn are prevented. After this the patient must go to bed, and a sweat must be procured by cordial medicines; by which the remaining effects of the poison will be carried off.

It hath been confidently asserted by many, that the American Indians are possessed of some specific remedy by which they can easily cure the bite of a rattle-snake. But Mr Catelby, who must have had many opportunities



nities of knowing this, positively denies that they have any such medicine. They make applications indeed, and sometimes the patient recovers; but these recoveries he ascribes to the strength of nature overcoming the poison, more than to the remedies made use of. He says, they are very acute in their prognostics whether a person that is bit will die or not; and when they happen to receive a bite in certain parts of the body, when the teeth of the animal enter a large vein, for instance, they quietly resign themselves to their fate, without attempting any thing for their own relief. Indeed, so violent and quick is the operation of this poison, that unless the antidote is instantly applied, the person will die before he can get to a house. It would seem therefore eligible for those who are in danger of such bites, to carry along with them some strong alkaline ley, or dry alkaline salt, or both, which could be instantly clapt on the wound, and by its dissolving power would destroy both the poison and the infected parts. Strong cordials also, such as ardent spirits, volatile alkali, &c. might possibly excite the languid powers of nature, and enable her to expel the enemy, which would otherwise prove too powerful. This seems to be somewhat confirmed from the account we have in the Philosophical Transactions of a gentleman bit by a rattle-snake, who was more relieved by a poultice of vinegar and vine-ashes put to his wound than any thing else. The vine-ashes being of an alkaline nature, must have saturated the vinegar, so that no part of the cure could be attributed to them: on the other hand, the ashes themselves could not have been saturated by the small quantity of acid necessary to form them into a poultice; of consequence they must have operated by their alkaline quality.— Soap-ley therefore, or very strong salt of tartar, may reasonably be thought to be the best external application, not only for the bites of vipers, but of every venomous creature; and in fact we find dry salt universally recommended both in the bites of serpents and of mad dogs. Dr Mead recommends the fat of vipers presently rubbed into the wound; but owns that it is not safe to trust to this remedy alone.

M E L Æ N E.

This is a distemper not very common, but which has been observed by the ancient physicians, and is described by Hippocrates under the name of *morbus niger*. It shews itself by a vomiting and purging of black tar-like matter; which Hippocrates, Boerhaave, and Van Swieten, supposed to be occasioned by atra bilis. But Dr Home, in his Clinical Experiments, shews that it is owing to an effusion of blood from the meseraic vessels, which by its stagnation and corruption assumes that strange appearance. The disease, he says, frequently follows hæmorrhagy; and those of a scorbutic habit are most subject to it. It is an acute disease, and terminates soon; yet is not attended with any great degree of fever. In one of Dr Home's patient's the crisis happened on the eighth day by diarrhœa; in another, on the 14th, by sweat and urine; and a third had no evident critical evacuation.

As to the cure, Dr Home observes, that bleeding is always necessary where the pulse can bear it; nor are we to be deterred from it by a little weakness of

the pulse, more than in the enteritis. Emetics are hurtful, but purgatives are useful. But the most powerful medicine for checking this hæmorrhage is the vitrolic acid: and, that this might be given in greater quantity, he mixed it with mucilage of gum arabic; by which means he was enabled to give double the quantity he could otherwise have done. The cold bath was tried in one instance, but he could not determine whether it was of any service or not. The cure was completed by exercise and the bark.

Of the DISEASES of CHILDREN.

Dr Buchan observes, that from the annual registers of the dead it appears, that about one half of the children born in Great Britain die under twelve years of age; and this very great mortality he attributes in a great measure to wrong management. The particulars of this wrong management enumerated by him are,

1. Mothers not suckling their own children. This, he owns, it is sometimes impossible for them to do; but where it can be done, he affirms that it ought never be omitted. This he says would prevent the unnatural custom of mothers leaving their own children to suckle those of others; on which he passes a most severe censure, and indeed scarce any censure can be severe enough upon such inhumanity. Dr Buchan informs us, "He is sure he speaks within bounds, when he says not one in a hundred of these children live who are thus abandoned by their mothers." For this reason he adds, that no mother should be allowed to suckle another's child till her own is fit to be weaned. A regulation of this kind would save many lives among the poorer sort, and would do no harm to the rich; as most women who make good nurses are able to suckle two children in succession upon the same milk.

2. Another source of the diseases of children is the unhealthiness of parents; and our author insists that no person who labours under an incurable malady ought to marry.

3. The manner of clothing children tends to produce diseases. All that is necessary here, he says, is to wrap the child in a soft loose covering; and the softness of every part of the infant's body sufficiently shews the injury which must necessarily ensue by pursuing a contrary method.

4. A new-born infant, instead of being treated with syrups, oils, &c. ought to be allowed to suck the mother's milk as soon as it comes into the breast; He condemns the practice of giving wines and spirituous liquors along with the food soon after birth; and says, that, if the mother or nurse has a sufficient quantity of milk, the child will need little or no other food before the third or fourth month. But to this it may reasonably be objected, not only that the nursing would thus be very severe on the mother; but if the child is left thus long without food, it will not easily relish it for some time, and its stomach is apt to be easily hurt by a slight change of diet after it has been long accustomed to one thing. Neither can it be shewn, that the strongest and most healthy infants are those which get no other food but the mother's milk during the first months of their life. In fact, children are evidently of a weak and lax habit of body, so

See treatise Lactation.

that many of their diseases must arise from that cause; all directions which indiscriminately advise an antiphlogistic regimen for infants as soon as they come into the world, must of necessity be wrong. Many instances in fact might be brought to shew, that by this preposterous method of starving infants, and at the same time treating them with vomits and purges, they are often hurried out of the world. Animal-food indeed is excessively agreeable to children, and they ought to be indulged with it in moderation; and this will prove a much better remedy for those acidities with which children are often troubled, than magnesia alba, crab's eyes, or other absorbents, which have the most pernicious effects on the stomachs of these tender creatures, and pall the appetite to a surprising degree. The natural appetites of children are indeed the best rule by which we can judge of what is proper or improper for them. They must no doubt be regulated as to the quantity; but we may be assured that what a child is very fond of will not hurt it if taken in moderation. When children are sick, they refuse every thing but the breast; and, if their distemper be very severe, they will refuse it also; and in this case they ought not to be pressed to take food of any kind: but when the sickness goes off, their appetite also returns, and they will require the usual quantity of food.

According to Dr Armstrong, *inward fits*, as they are called, are in general the first complaint that appears in children; and as far as he has observed, most, if not all infants, during the first months, are more or less liable to them. The symptoms are these. The child appears as if it was asleep, only the eyelids are not quite closed; and if you observe them narrowly, you will see the eyes frequently twinkle, with the white of them turned up. There is a kind of tremulous motion in the muscles of the face and lips, which produces something like a simper or a smile, and sometimes almost the appearance of a laugh. As the disorder increases, the infant's breath seems now and then to stop for a little; the nose becomes pinched; there is a pale circle about the eyes and mouth, which sometimes changes to livid, and comes and goes by turns; the child starts, especially if you go to stir it though ever so gently, or if you make any noise near it. Thus disturbed, it sighs, or breaks wind, which gives relief for a little, but presently it relapses into the dozing. Sometimes it struggles hard before it can break wind, and seems as if falling into convulsions; but a violent burst of wind from the stomach, or vomiting, or a loud fit of crying, sets all to rights again. As the child increases in strength, these fits are the more apt to go off spontaneously and by degrees; but in case they do not, and if there is nothing done to remove them, they either degenerate into an almost constant drowsiness, (which is succeeded by a fever and the thrush), or else they terminate in vomitings, four, curdled, or green stools, the watery-gripes, and convulsions. The thrush indeed very often terminates in these last symptoms. Wherefore, as these complaints naturally run into one another, or succeed each other, they may be considered, in a manner, as only different stages of the same disease, and which derive their origin from the same cause. Thus, the inward fits may be looked upon as the first stage of the disorder; the fever, and thrush (when it happens), as

the second; the vomitings, four, curdled, green or watery stools, as the third; and convulsions, as the last.

As to the cause of these complaints, he observes, that in infants the glandular secretions, which are all more or less glutinous, are much more copious than in adults. During the time of sucking, the glands of the mouth and fauces being squeezed by the contraction of the muscles, spue out their contents plentifully, which afterwards mixing with the mucus of the gullet and stomach, render the milk of a slimy consistence, by which means it is not so readily absorbed into the lacteals; and as in most infants there is too great an acidity in the stomach, the milk is thereby curdled, which adds to the load; hence sickness and spasms, which, being communicated by sympathy to the nerves of the gullet and fauces, produce the convulsive motions above described, which go commonly by the name of *inward fits*. The air, likewise, which is drawn in during suction, mixing with the milk, &c. in the stomach, perhaps contributes towards increasing the spasms above-mentioned. He is the more induced to attribute these fits to the causes now assigned, that they always appear immediately after sucking or feeding; especially if the child has been long at the breast, or fed heartily, and has been laid down to sleep without having first broken wind, which ought never to be done. Another reason is, that nothing relieves them so soon as belching or vomiting; and the milk or food they throw up is generally either curdled, or mixed with a large quantity of heavy phlegm. In case they are not relieved by belching or vomiting, the fits sometimes continue a good while, and gradually abate, according as the contents of the stomach are pushed into the intestines; and as soon as the former is pretty well emptied, the child is waked by hunger, cries, and wants the breast; he sucks, and the same process is repeated. Thus, some children for the first weeks are kept almost always in a dose, or seemingly so; especially if the nurses, either through laziness or want of skill, do not take care to rouse them when they perceive that it is not a right sleep, and keep them awake at proper intervals. This dozing is reckoned a bad sign amongst experienced nurses; who look upon it as a forerunner of the thrush, as indeed it often is; and therefore, when it happens, we ought to be upon our guard to use the necessary precautions for preventing that disorder.

For these disorders, the only remedy recommended by Dr Armstrong is antimonial wine, given in a few drops, according to the age of the infant. By this means the superabundant mucus will no doubt be evacuated; but at the same time we must remember, that this evacuation can only *palliate*, and not cure the disease. This can only be effected by tonics; and a decoction of the Peruvian bark, made into a syrup, will readily be taken by infants, and may be safely exhibited from the very day they come into the world, or as soon as their bowels are emptied of the meconium by the mother's milk or any other means.

Dr Clarke observes, that *fractures of the limbs*, and *compressions of the brain*, often happen in difficult labours; and that the latter are often followed by convulsions soon after delivery. In these cases, he says, it will be advisable to let the navel-string bleed two or three spoonfuls before it is tied. Thus the oppression of the brain will be relieved, and the disagreeable consequences

frequencies just mentioned will be prevented. But if this has been neglected, and fits have actually come on, we must endeavour to make a revulsion by all the means in our power; as by opening the jugular vein, procuring an immediate discharge of the urine and meconium, and applying small blisters to the back, legs, or behind the ears. The semicupium, too, would seem to be useful in this case, by deriving the oppressive load of fluids from the head and upper parts.

It sometimes happens after a tedious labour, that the child is so faint and weak as to discover little or no signs of life. In such a case, after the usual cleaning, the body should be immediately wrapped in warm flannel, and briskly tossed about in the nurse's arms, in order, if possible, to excite the languid circulation. If this fails, the breast and temples may be rubbed with brandy or other spirits; or the child may be provoked to cry, by whipping, or other stimulating methods, as the application of onion, or salt and spirit of hartshorn, to the mouth and nostrils. But after all these expedients have been tried in vain, and the recovery of the child absolutely despaired of, it has sometimes been happily revived by introducing a short catheter, or blow-pipe, into the mouth, and gently blowing into the lungs at different intervals. Such children, however, are apt to remain weak for a considerable time, so that it is often no easy matter to rear them; and therefore particular care and tenderness will be required in their management, that nothing may be omitted which can contribute either to their preservation, or the improvement of their strength and vigour.

All the disorders which arise from a retention of the meconium, such as the red gum, may easily be removed by the use of gentle laxatives; but the great source of mortality among children is the breeding of their teeth. The usual symptoms produced by this are fretting; restlessness; frequent and sudden startings, especially in sleep; costiveness; and sometimes a violent diarrhoea, fever, or convulsions. In general, those children breed their teeth with the greatest ease, who have a moderate laxity of the bowels, or a plentiful flow of saliva during that time.

In mild cases, we need only, when necessary, endeavour to promote the means by which nature is observed to carry on the business of dentition in the easiest manner. For this purpose, if a costiveness is threatened, it must be prevented, and the body kept always gently open; and the gums should be relaxed by rubbing them frequently with sweet oils, or other softening remedies of that kind, which will greatly diminish the tension and pain. At the same time, as children about this period are generally disposed to chew whatever they get into their hands, they ought never to be without something that will yield a little to the pressure of their gums, as a crust of bread, a wax-candle, a bit of liquorice-root, or such like; for the repeated muscular action, occasioned by the constant biting and gnawing at such a substance, will increase the discharge of the salivary glands, while the gums will be so forcibly pressed against the advancing teeth, as to make them break out much sooner, and with less uneasiness, than would otherwise happen. Some likewise recommend a slice of the rind of fresh bacon, as a proper masticatory for the child, in order to bring moisture into its mouth, and facilitate the eruption of the teeth by exercising the gums. If

these means, however, prove ineffectual, and bad symptoms begin to appear, the patient will often be relieved immediately, by cutting the inflamed gum down to the tooth, where a small white point shows the latter to be coming forward. When the pulse is quick, the skin hot and dry, and the child of a sufficient age and strength, emptying the vessels by bleeding, especially at the jugular, will frequently be necessary here, as well as in all other inflammatory cases; and the belly should be opened from time to time, by emollient oily or mucilaginous glysters. But, on the contrary, if the child is low, sunk, and much weakened, repeated doses of the spirit of hartshorn, *tinctura fuliginis*, and the like reviving medicines, ought to be prescribed. Blisters applied to the back, or behind the ears, will often be proper in both cases. A prudent administration of opiates, when their use is not forbid by costiveness or otherwise, is sometimes of great service in difficult teething, as, by mitigating pain, they have a tendency to prevent its bad effects, as a fever, convulsions, or other violent symptoms; and often they are absolutely necessary, along with the testaceous powders, for checking an immoderate diarrhoea.

When cathartics are necessary, but the child seems too tender and weak to bear their immediate operation, they should be given to the nurse; in which case they will communicate so much of their virtues to the milk as will be sufficient to purge the infant.

As most young children, if in health, naturally sleep much, and pretty soundly, we may always be apt to suspect that something is amiss when they begin to be subject to *watching* and *frights*; symptoms which seldom or never occur but either in consequence of some present disorder not yet taken notice of, or as the certain forerunners of an approaching indisposition. We should immediately, therefore, endeavour to find out their cause, that we may use every possible means to remove or prevent it; otherwise the want of natural rest, which is so very prejudicial to persons of all ages, will soon reduce the infant to a low and emaciated state, which may be followed by an hectic fever, diarrhoea, and all the other consequences of weakness and debility. These symptoms, being always the effects of irritation and pain, may proceed, in very young infants, from crudities or other affections of the *primæ viæ* producing flatulencies or gripes; about the sixth or seventh month, they may be owing to that uneasiness which commonly accompanies the breeding of the teeth; and after a child is weaned, and begins to use a different kind of food, worms become frequently an additional cause of watchings and disturbed sleep. Hence, to give the necessary relief on these occasions, the original complaint must first be ascertained from the child's age and other concomitant circumstances, and afterwards treated according to the nature of the case. Women and nurses are too apt to have recourse to opiates in the watchings of children, especially when their own rest happens to be much disturbed by their continual noise and clamour. But this practice is often prejudicial, and never ought to have place when the belly is in the least obstructed.

There is no complaint more frequent among children than that of *worms*; the general symptoms of which



which have been already enumerated; but it must be observed, that all the symptoms commonly attributed to worms alone, may be produced by a foulness of the bowels. Hence practitioners ought never to rest satisfied with administering to their patients such medicines as are possessed only of an anthelmintic quality, but to join them with those which are particularly adapted for cleansing the *primæ viæ*; as it is uncertain whether a foulness of the bowels may not be the cause of all the complaints. This practice is still the more advisable, on account of viscid humours in the intestines affording lodgment to the ova of worms; which, without the convenience of such a receptacle, would be more speedily discharged from the body.

The difficulty of curing what is called a *worm fever*, arises, according to Dr Musgrave, from its being frequently attributed to worms, when the cause of the disorder is of a quite different nature. He does not mean to deny that worms do sometimes abound in the human body, nor that the irritation caused by them does sometimes produce a fever; but he apprehends these cases to be much more uncommon than is generally imagined, and that great mischief is done by treating some of the disorders of children as worm cases, which really are not so. Dr Hunter, it is observed, is of the same opinion on this point; and he has, we are told, dissected great numbers of children who have been supposed to die of worm-fevers, and whose complaints were of course treated as proceeding from worms, in whom, however, there appeared, upon dissection, to be not only no worms, but evident proofs of the disorders having been of very different natures.

The *spurious worm-fever*, as Dr Musgrave terms it, has, in all the instances he has seen of it, arisen evidently from the children having been indulged with too great quantities of fruit; though a poor cold diet may, he thinks, occasionally give birth to it. Every sort of fruit eaten in excess will probably produce it; but an immoderate use of cherries seems to be the most common cause of it. The approach of this disorder has a different appearance, according as it arises from a habit of eating fruit in rather too large quantities, or from an excessive quantity eaten at one time. In the former case, the patient gradually grows weak and languid; his colour becomes pale and livid; his belly swells and grows hard; his appetite and digestion are destroyed; his nights grow restless, or at least his sleep is much disturbed with startings, and then the fever soon follows; in the progress of which, the patient grows comatose, and at times convulsed; in which state, when the event is fatal, he dies. The pulse at the wrist, though quick, is never strong or hard; the carotids, however, beat with great violence, and elevate the skin so as to be distinctly seen at a distance. The heat is at times considerable, especially in the trunk; though at other times, when the brain is much oppressed, it is little more than natural. It is sometimes accompanied by a violent pain of the epigastric region, though more commonly the pain is slight, and terminates in a coma; some degree of pain, however, seems to be inseparable from it, so as clearly to distinguish this disorder from other comatose affections.

When a large quantity of fruit has been eaten at once, the attack of the disorder is instantaneous, and its progress rapid; the patient often passing, in the

space of a few hours, from apparently perfect health, to a stupid, comatose, and almost dying state. The symptoms of the fever, when formed, are in both cases nearly the same; except that, in this latter sort, a little purulent matter is sometimes discharged, both by vomit and stool, from the very first day. The stools, in both cases, exhibit sometimes a kind of curd resembling curdled milk, at other times a floating substance is observed in them; and sometimes a number of little threads and pellicles, and now and then a single worm.

Strong purgatives, or purges frequently repeated, in this disorder, are greatly condemned by our author, as they in general not only aggravate the symptoms already present, but are sometimes the origin of convulsions. Bloodletting is not to be thought of in any stage of the disorder.

Although frequent purging, however, is not recommended, yet a single vomit and purge are advised in the beginning of the disorder, with a view to evacuate such indigested matter and mucus as happens to remain in the stomach and bowels. These having operated properly, there is seldom occasion for repeating them; and it is sufficient, if the body be costive, to throw up, every second or third day, a clyster, composed of half a dram of aloes, dissolved in five ounces of infusion of chamomile.

The principal part of the cure, however, depends upon external applications to the bowels and stomach; and, as the cause of the disorder is of a cold nature, the applications must be warm, cordial, and invigorating; and their action must be promoted by constant actual heat.

The following is the form recommended.

“Take of leaves of wormwood and rue, each equal parts: make a saturated decoction in a sufficient quantity of water, with which foment the region of the stomach and abdomen for a quarter of an hour, repeating the fomentation every three or four hours. A poultice of the boiled herbs is to be applied after the fomentation, and constantly renewed as it cools.” For internal use, the following is all that has been found necessary. “Take of spirituous and simple cinnamon-water, each half an ounce; oil of almonds, an ounce and an half; balsamic syrup, three drachms. Mix, and shake the vial when used.” From two to six drachms are given every third hour.

When any nervous symptoms come on, or remain after the disorder is abated, they are easily removed by giving a pill of four grains of *asafoetida* once or twice a-day.

The diagnostics of worms are very uncertain; but, even in real worm cases, the treatment above recommended would, it is imagined, be much more efficacious than the practice commonly had recourse to. As worms either find the constitution weakly, or very soon make it so, the frequent repetition of purges, particularly mercurials, cannot but have a pernicious effect. Bares-foot is still more exceptionable, being in truth to be ranked rather among poisons than medicines. Worm-seed and bitters are too offensive to the palate and stomach to be long persisted in. The powder of coralline creates disgust by its quantity; and the infusion of pink-root is well known to occasion now and then vertiginous complaints and fits.

Fomenting the belly night and morning with a  
strong

strong decoction of rue and wormwood, is much recommended. It is a perfectly safe remedy, and, by invigorating the bowels, has thereby a considerable influence in rendering them capable of expelling such worms as they happen to contain. After the fomentation, it is advised to anoint the belly with a liniment, composed of one part of essential oil of rue, and two parts of a decoction of rue in sweet oil. Of internal medicines, the best is *asafœtida*, with an *aloëtic* pill or two at proper intervals.

The diet of children disposed to worms, should be warm and nourishing, consisting in part at least of animal food, which is not the worst for being a little seasoned. Their drink may be any kind of beer that is well hopped, with now and then a small draught of porter or *negus*. A total abstinence from butter is not so necessary, perhaps, as is generally imagined. Poor cheese must by all means be avoided; but such as is rich and pungent, in a moderate quantity, is particularly serviceable. In the spurious worm-fever, the patient should be supported occasionally by small quantities of broth; and, at the close of it, when the appetite returns, the first food given should be of the kinds above recommended.

The diet here recommended will, perhaps, be thought extraordinary, as the general idea is at present, that, in the management of children, nothing is so much to be avoided as repletion and rich food. It is no doubt an error to feed children too well, or to indulge them with wine and rich sauces; but it is equally an error to confine them to too strict or too poor a diet, which weakens their digestion, and renders them much more subject to disorders of every kind, but particularly to disorders of the bowels. In regard to the spurious worm-fever, if it be true that acid fruits too plentifully eaten are the general cause of it, it follows as a consequence, that a warm nutritious diet, moderately used, will most effectually counteract the mischief, and soonest restore the natural powers of the stomach. Besides, if the disorder does not readily yield to the methods here directed, as there are many examples, and some have happened to our author, of its terminating by an inflammation and suppuration of the navel, it is highly advisable to keep this probability in view, and, by a moderate allowance of animal-food, to support those powers of nature, from which only such a happy crisis is to be expected.

## OF MEDICAL ELECTRICITY.

THE application of this subtle fluid to medicinal purposes was thought of soon after the discovery of the electric shock; and after various turns of reputation, its medical virtues seem now to be pretty well established. After giving so particular a description of the electrical apparatus under the proper article, it would here be superfluous to say any thing farther on that head. We shall only observe, that Mr Cavallo, who hath published the latest and the best treatise on Medical Electricity, entirely disapproves of giving violent shocks, and finds it most efficacious to expose the patient to the electrical aura discharged from an iron or a wooden point; or if shocks are given, they should be very slight, and not exceed 12 or 14 at a time. In this way he recommends it as effectual in a great num-

ber of disorders. The patient may be electrified from three to ten minutes; but if sparks are drawn, they should not exceed the number of shocks above-mentioned.

*Rheumatic disorders*, even of long standing, are relieved, and generally quite cured, by only drawing the electric fluid with a wooden point from the part, or by drawing sparks thro' flannel. The operation should be continued for about four or five minutes, repeating it once or twice every day.

*Deafness*, except when it is occasioned by obliteration, or other improper configuration of the parts, is either entirely or partly cured by drawing the sparks from the ear with the glass-tube director, or by drawing the fluid with a wooden point. Sometimes it is not improper to send exceedingly small shocks (for instance, of one-thirtieth of an inch) from one ear to the other.—It has been constantly observed, that whenever the ear is electrified, the discharge of the wax is considerably promoted.

The *toothach*, occasioned by cold, rheumatism, or inflammation, is generally relieved by drawing the electric fluid with a point, immediately from the part, and also externally from the face. But when the body of the tooth is affected, electrization is of no use; for it seldom or never relieves the disorder, and sometimes increases the pain to a prodigious degree.

*Swellings* in general, which do not contain any matter, are generally cured by drawing the electric fluid with a wooden point. The operation should be continued for three or four minutes every day.—It is very remarkable, that in some cases of white swellings, quite cured by means of electricity, the bones and cartilages were in some measure disfigured.

*Inflammations* of every sort are generally relieved by a very gentle electrization.

In *inflammations of the eyes*, the throwing of the electric fluid by means of a wooden point is constantly attended with great benefit; the pain being quickly abated, and the inflammation being generally dissipated in a few days. In these cases, the eye of the patient must be kept open; and care should be taken not to bring the wooden point very near it, for fear of causing any spark. Sometimes it is sufficient to throw the fluid with a metal point; for in these cases, too great an irritation should be always avoided. It is not necessary to continue this operation for three or four minutes without intermission; but, after throwing the fluid for about half a minute, a short time may be allowed to the patient to rest and to wipe his tears, which generally flow very copiously; then the operation may be continued again for another half minute, and so on for four or five times every day.

The *gutta serena* has been often cured by electrization; but at the same time it must be confessed, it has proved ineffectual in many cases, in which it was administered for a long time and with all possible attention. However, it hath never been known that any body was made worse by it. The best method of administering electricity in such cases, is first to draw the electric fluid with a wooden point for a short time, and then to send about half a dozen of shocks of one-twentieth of an inch from the back and lower part of the head to the fore head, very little above the eye.

A remarkable disease of the eye was some time ago perfectly

perfectly cured by electrization; it was an opacity of the vitreous humour of the eyes. This seems to be the only case of the kind to which electricity was applied.

All the cases of *fistula lacrymalis* which Mr Cavallo hath known to have been electrified by persons of ability for a sufficient time, have been entirely cured. The method generally practised, has been that of drawing the fluid with a wooden point, and to take very small sparks from the part. The operation may be continued for about three or four minutes every day. It is remarkable, that in those cases, after curing the *fistula lacrymalis*, no other disease was occasioned by it, as blindness, inflammations, &c. by suppressing that discharge.

*Palsies* are seldom perfectly cured by means of electricity, especially when they are of long standing; but they are generally relieved to a certain degree. The method of electrifying in those cases, is to draw the fluid with the wooden point, and to draw sparks thro' flannel, or though the usual coverings of the part if they are not too thick. The operation may be continued for about five minutes per day.

*Ulcers*, or open sores of every kind, even of a long standing, are generally disposed to heal by electrization. The general effects are a diminution of the inflammation, and at first a promotion of the discharge of properly formed matter; which discharge gradually lessens, according as the limits of the sore contract, till it is quite cured. In these cases the gentlest electrization must be used, in order to avoid too great an irritation, which is generally hurtful. To draw or throw the fluid with a wooden or even with a metal point, for three or four minutes per day, is absolutely sufficient.

*Cutaneous eruptions* have been successfully treated with electrization: but in these cases it must be observed, that if the wooden point is kept too near the skin, so as to cause any considerable irritation, the eruption will be caused to spread more; but if the point be kept at about six inches distance, or farther, if the electrical machine is very powerful, the eruptions will be gradually diminished, till they are quite cured. In this kind of disease, the immediate and general effect of the wooden point is to occasion a warmth about the electrified part, which is always a sign that the electrization is rightly administered.

The application of electricity has perfectly cured various cases of *St Vitus's dance*, or of that disease which is commonly called so; for it is the opinion of some very learned physicians, that the real disease called *St Vitus's dance*, which formerly was more frequent, than it is at present, is different from that which now goes under that name. In this disease, shocks of about one-tenth of an inch may be sent through the body in various directions, and also sparks may be taken. But if this treatment proves very disagreeable to the patient, then the shocks must be lessened, and even omitted; instead of which, some other more gentle applications must be substituted.

*Scrophulous tumours*, when they are just beginning, are generally cured by drawing the electric fluid with a wooden or metal point from the part. This is one of those kinds of diseases in which the action of electricity requires particularly the aid of other medicines

in order to effect a cure more easily; for scrophulous affections generally accompany a great laxity of the habit, and a general cachexy, which must be obviated by proper remedies.

In *cancers*, the pains only are mostly alleviated by drawing the electric fluid with a wooden or metal point. Mr Cavallo, however, mentions one case in which a most confirmed cancer of very long standing, on the breast of a woman, has been much reduced in size. It is remarkable, that this patient was so far relieved by drawing the fluid with a metal point from the part, that the excruciating pains she had suffered for many years did almost entirely disappear; and also, that when the electric fluid was drawn by means of a wooden point, the pains did rather increase. This person is still under the application of electricity; and the cancer seems not unlikely to be perfectly cured, altho' contrary to the expectations even of the judicious physician who electrifies her, and who knows too well the nature of that dangerous disease.

*Abscesses*, when they are in their beginning, and in general whenever there is any tendency to form matter, electrization disperses them. Lately, in a case in which matter was formed upon the hip, called the *lumbar abscess*, the disease was perfectly cured by means of electricity. The *sciatica* has also been often cured by it. In all such cases, the electric fluid must be sent through the part by means of two directors applied to opposite parts, and in immediate contact either with the skin or with the coverings, when these are very thin. It is very remarkable, that the mere passage of the electric fluid in this manner, is generally felt by the patients afflicted with those disorders, nearly as much as a small shock is felt by a person in good health. Sometimes a few shocks have been also given, but it seems more proper to omit them; because sometimes, instead of dispersing, they rather accelerate the formation of matter.

In cases of *pulmonary inflammations*, when they are in the beginning, electrization has been sometimes beneficial; but in confirmed diseases of the lungs, it does not seem to have ever afforded any unquestionable benefit; however, it seems that in such cases the power of electricity has been but seldom tried.

*Nervous head-achs*, even of a long standing, are generally cured by electrization. For this disease, the electric fluid must be thrown with a wooden, and sometimes even with a metal point, all round the head successively. Sometimes exceedingly small shocks have been administered; but these can seldom be used, because the nerves of persons subject to this disease are so very irritable, that the shocks, the sparks, and sometimes even the throwing the electric fluid with a wooden point kept very near the head, throw them into convulsions.

The application of electricity has often been found beneficial in the *dropsy* when just beginning, or rather in the tendency to a dropsy; but it has never been of any use in advanced dropsies. In such cases, the electric fluid is sent through the part, in various directions, by means of two directors, and sparks are also drawn across the flannel or the cloaths; keeping the metal rod in contact with them, and shifting it continually from place to place. This operation should be continued at least ten minutes, and should be repeated



peated once or twice a-day.—Perhaps in those cases, a simple electrization, (viz. to insulate the patient, and to connect it with the prime conductor whilst the machine is in action) continued for a considerable time, as an hour or two, would be more beneficial.

The *gout*, extraordinary as it may appear, has certainly been cured by means of electricity, in various instances. The pain has been generally mitigated, and sometimes the disease has been removed so well as not to return again. In those cases, the electric fluid has been thrown by means of a wooden point, altho' sometimes, when the pain was too great, a metal point only has been used.

*Agues* very seldom fail of being cured by electricity, so that sometimes one electrization or two have been sufficient. The most effectual and sure method has been that of drawing sparks through flannel, or the cloaths, for about ten minutes or a quarter of an hour. The patients may be electrified either at the time of the fit, or a short while before the time in which it is expected.

The *suppression of the menses*, which is a disease of the female sex that often occasions the most disagreeable and alarming symptoms, is successfully and speedily cured by means of electricity, even when the disease is of long standing, and after that the most powerful medicines used for it have proved ineffectual. The cases of this sort in which electrization has proved useless are so few, and the successful ones so numerous, that the application of electricity for this disease may be justly considered as an efficacious and certain remedy. Great attention and knowledge is required, in order to distinguish the arrest of the menses from a state of pregnancy. In the former, the application of electricity, as we observed above, is very beneficial; whereas, in the latter, it may be attended with very disagreeable effects: it is therefore a matter of great importance to ascertain the real cause of the disease, before the electricity be applied in those cases. Pregnant women may be electrified for other diseases, but always using very gentle means, and directing the electric fluid through other parts of the body distant from those subservient to generation. In the real suppression of the menses, small shocks, *i. e.* of about one-twentieth of an inch, may be sent thro' the pelvis; sparks may be taken through the cloaths from the parts adjacent to the seat of the disease; and also the electric fluid may be transmitted by applying the metallic or wooden extremities of two directors to the hips, in contact with the clothes; part of which may be removed in case they are too thick. Those various applications of electricity should be regulated according to the constitution of the patient. The number of shocks may be about 12 or 14. The other applications may be continued for two or three minutes; repeating the operation every day. But either strong shocks, or a stronger application of electricity than the patient can conveniently bear, should be carefully avoided; for by those means, sometimes more than a sufficient discharge is occasioned, which is not easily cured. In cases of uterine hæmorrhages, it is not known that the application of electricity was ever beneficial, neither that it has been often tried. Perhaps a very gentle electrization, as to keep the patient insulated and connected with the prime conductor, whilst the electrical machine is in action, may be some benefit.

In respect to *unnatural discharges and fluxes* in general, it may be observed, that some discharges are quite unnatural or adventitious, as the *fistula lacrymalis*, and some species of the venereal disease; but others are only increased natural discharges, such as the menses, perspiration, &c. Now the power of electricity in general, has been found more beneficial for the first, than for the second sort of discharges, which are mostly increased by it.

In the *venereal disease*, electrization has been generally forbidden; having mostly increased the pains, and other symptoms, rather than diminished them. Indeed, considering that any sort of stimulus has been found hurtful to persons afflicted with that disorder, it is no wonder that electricity has produced some bad effects, especially in the manner it was administered some time ago, viz. by giving strong shocks. However, it has been lately observed, that a very gentle application of electricity, as drawing the fluid by means of a wooden or metal point, is peculiarly beneficial in various cases of this kind, even when the disease has been of long standing. Having remarked above, that tumours, when just beginning, are dispersed, and that unnatural discharges are gradually suppressed by a judicious electrization, it is superfluous to describe particularly those states of the venereal disease in which electricity may be applied; it is only necessary to remind the operator to avoid any considerable stimulus in cases of this sort.

The application of electricity has been found also beneficial in other diseases besides those mentioned above; but as the facts are not sufficiently numerous, so as to afford the deduction of any general rules, we have not thought proper to take any particular notice of them.

We may lastly observe, that, in many cases, the help of other remedies to be prescribed by the gentlemen of the faculty is required to assist the action of electricity, which by itself would perhaps be useless; and, on the other hand, electrization may often be applied to assist the action of other remedies, as of sudorifics, strengthening medicines, &c.

#### Of FIXED AIR as a MEDICINE.

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THE antiseptic qualities of fixed air have of late introduced it as a medicine in cases of putrid disorders. Dr Percival observes, that, though fatal if inspired in a very large quantity, it may in smaller quantities be breathed without danger or uneasiness. And it is a confirmation of this conclusion, that at Bath, where the waters copiously exhale this mineral spirit, the bathers inspire it with impunity. At Buxton also, where the bath is in a close vault, the effects of such effluvia, if noxious, must certainly be perceived.

Encouraged by these and some other considerations, he has administered fixed air in more than 30 cases of the *phthisis pulmonalis*, by directing his patients to inspire the steams of an effervescing mixture of chalk and vinegar through the spout of a coffee-pot. The hectic fever has in several instances been considerably abated, and the matter expectorated has become less offensive and better digested. He hath not yet, however, been so fortunate in any once case as to effect a cure; although the use of mephitic air has been accompanied with proper internal medicines. But Dr Withering has been more successful. One phthisical patient under his care, by a similar course entirely recovered; another

other was rendered much better; and a third, whose case was truly deplorable, seemed to be kept alive by it more than two months. It may be proper to observe, that fixed air can only be employed with any prospect of success in the latter stages of the *phthisis pulmonalis*, when a purulent expectoration takes place. After the rupture and discharge of a vomica, also, such a remedy promises to be a powerful palliative. Antiseptic fumigations and vapours have been long employed, and much extolled, in cases of this kind. The following experiment was made to determine whether their efficacy in any degree depends on the separation of fixed air from their substance.

One end of a bent tube was fixed in a phial full of lime-water; the other end in a bottle of the tincture of myrrh. The junctures were carefully luted; and the phial containing the tincture of myrrh was placed in water, heated almost to the boiling point, by the lamp of a tea-kettle. A number of air-bubbles were separated, but probably not of the mephitic kind; for no precipitation ensued in the lime-water. This experiment was repeated with the *tinct. Tolutana Ph. Ed.* and with *sp. vinos. camph.* and the result was entirely the same. The medicinal action therefore of the vapours raised from such tinctures, cannot be ascribed to the extrication of fixed air; of which it is probable bodies are deprived by chemical solution as well as by mixture.

If mephitic air be thus capable of correcting purulent matter in the lungs, we may reasonably infer it will be equally useful when applied externally to *soul ulcers*; and experience confirms the conclusion. Even the sanies of a cancer, when the carrot-poultice failed, has been sweetened by it, the pain mitigated, and a better digestion produced. But though the progress of the cancers seems to be checked by the fixed air, it is to be feared that a cure will not be effected. A palliative remedy, however, in a disease so desperate and loathsome, may be considered as a very valuable acquisition. Perhaps nitrous air might be still more efficacious. This species of facitious air is obtained from all the metals, except zinc, by means of the nitrous acid; as a sweetener and antiseptic, it far surpasses fixed air.

In the ulcerous *sore throat*, much advantage has been experienced from the vapours of effervescing mixtures drawn into the *fauces*. But this remedy should not supersede the use of other antiseptic applications.

In *malignant fevers*, wines abounding with fixed air may be administered to check the septic ferment, and sweeten the putrid *colliquies* in the *prime viæ*. If the laxative quality of such liquors be thought an objection to the use of them, wines of a greater age may be given, impregnated with mephitic air.—The patient's common drink might also be medicated in the same way. A putrid diarrhoea frequently occurs in the latter stage of such disorders; and it is a most alarming and dangerous symptom. If the discharge be stopped by astringents, a putrid *foetor* is retained in the body, which aggravates the delirium, and increases the fever. On the contrary, if it be suffered to take its course, the strength of the patient must soon be exhausted, and death unavoidably ensue. The injection of mephitic air into the intestines, under these circumstances, bids fair to be highly serviceable. And in some cases of this kind,

the vapour of chalk and oil of vitriol conveyed into the body by the machine employed for tobacco-clysters, quickly restrained the diarrhoea, corrected the heat and fetor of the stools, and in a short time removed every symptom of danger.

As a *solvent* of the *calculus*, its virtues have been already mentioned; but the experiments made on that subject have been too few to determine the matter with sufficient accuracy.

## CONCLUSION;

*Being a Discourse on the HYGEINE, or Method of Preserving HEALTH.* 499

### I. RÔLES for the Management of VALETUDINARIANS.

THAT part of the medical system which lays down rules for the preservation of health, and prevention of diseases, termed *Hygeine*, is not to be strictly understood as if it respected only those people who enjoy perfect health, and who are under no apprehensions of disease, for such seldom either desire or attend to medical advice; but should rather be considered as relating to valetudinarians, or to such as, though not actually sick, may yet have sufficient reasons to fear that they will soon become so: hence it is that the rules must be applied to correct morbid dispositions, and to obviate the various things that were shewn to be the remote or possible causes of diseases.

From the way in which the several temperaments are usually mentioned by systematic writers, it should seem as if they meant that every particular constitution must be referred to one or other of the four; but this is far from being reducible to practice, since by much the greater number of people have constitutions so indistinctly marked, that it is hard to say to which of the temperaments they belong.

When we actually meet with particular persons who have evidently either,

1. Too much strength and rigidity of fibre, and too much sensibility;
  2. Too little strength, and yet too much sensibility;
  3. Too much strength, and but little sensibility; or,
  4. But little sensibility, joined to weakness;
- we should look on such persons as more or less in the valetudinary state, who require that these morbid dispositions be particularly watched, lest they fall into those diseases which are allied to the different temperaments.

People of the first-mentioned temperament being liable to suffer from continued fevers, especially of the inflammatory species, their scheme of preserving health should consist in temperate living, with respect both to diet and exercise; they should studiously avoid immoderate drinking, and be remarkably cautious lest any of the natural discharges be checked. People of this habit bear evacuations well, especially when they ought not, however, to lose blood but when they really require to have the quantity lessened; because too much of this evacuation would be apt to reduce the constitution to the second-mentioned temperament, wherein strength is deficient, but sensibility redundant.

Persons of the second temperament are remarkably prone to suffer from painful and spasmodic diseases, and are easily ruffled; and those of the softer sex who have this delicacy of habit, are very much disposed to hysterical

PRACTICE physical complaints. The scheme here should be, to strengthen the solids by moderate exercise, cold bathing, the cortex, and chalybeate waters; particular attention should constantly be had to the state of the digestive organs, to prevent them from being overloaded with any species of faburra which might engender flatulency, or irritate the sensible membranes of the stomach and intestines, from whence the disorder would soon be communicated to the whole nervous system. Persons of this constitution should never take any of the drastic purges, nor stronger emetics; neither should they lose blood but in cases of urgent necessity. But a principal share of management, in these extremely irritable constitutions, consists in avoiding all sudden changes of every sort, especially those with respect to diet and cloathing, and in keeping the mind as much as possible in a state of tranquillity: hence the great advantages which people of this frame derive from the use of medicinal waters drunk on the spot, because of that freedom from care and serious business of every kind, which generally obtains in all the places laid out for the reception of valetudinarians.

The third-mentioned temperament, where there is an excess of strength and but little sensibility, does not seem remarkably prone to any distressing or dangerous species of disease; and therefore it can hardly be supposed that persons so circumstanced will either of themselves think of any particular scheme of management, or have recourse to the faculty for their instructions: such constitutions, however, we may observe, bear all kinds of evacuations well, and sometimes require them to prevent an over-fullness, which might end in an oppression of the brain or some other organ of importance.

But the fourth temperament, where we have weakness joined to want of sensibility, is exceedingly apt to fall into tedious and dangerous diseases, arising from a defect of absorbent power in the proper sets of vessels, and from remissness of the circulation in general: whence corpulency, dropsy, jaundice, and different degrees of scorbutic affection. In order to prevent these, or any other species of accumulation and deprivation of the animal-fluids, the people of this constitution should use a generous course of diet, with brisk exercise, and be careful that none of the secretions be interrupted, nor any of the natural discharges suppressed. These constitutions bear purging well, and often require it; as also the use of emetics, which are frequently found necessary to supply the place of exercise, by agitating the abdominal viscera, and are of service to prevent the stagnation of bile, or the accumulation of mucous humours, which hinder digestion, and clog the first passages. The free use of mustard, horse-radish, and the like sort of stimulating dietetics, is serviceable in these torpid habits.

When the general mass of fluids is accumulated beyond what is conducive to the perfection of health, there arises what the writers term a *plethora*, which may prove the source of different diseases; and therefore, when this overfullness begins to produce languor and oppression, care should be taken in time to reduce the body to a proper standard, by abridging the food and increasing the natural discharges, using more exercise, and indulging less in sleep.

But in opposite circumstances, where the fluids have been exhausted, we are to endeavour the prevention of further waste by the use of strengthening stomachics,

nourishing diet, and indulgence from fatigue of body or mind.

Vitiated fluids are to be considered as affected either with the different kinds of general acrimony, or as betraying signs of some of the species of morbid matter which give rise to particular diseases, such as gout, rheumatism, stone, scurvy, &c.

During the state of infancy, we may sometimes observe a remarkable acidity, which not only shews itself in the first passages, but also seems to contaminate the general mass of fluids. As it takes its rise, however, from weak bowels, our views, when we mean to prevent the ill consequences, must be chiefly directed to strengthen the digestive organs, as on their soundness the preparation of good chyle depends; and hence small doses of rhubarb and chalybeates (either the natural chalybeate waters mixed with milk, or the *floræ martialis* in doses of a few grains, according to the age of the child), are to be administered; and the diet is to be so regulated as not to add to this acid tendency: brisk exercise is likewise to be enjoined, with frictions on the stomach, belly, and lower extremities.

Where the fluids tend to the putrefactive state, which shews itself by rottenness of the teeth, sponginess and bleeding of the gums, a bloated look and livid cast; the diet then should be chiefly of fresh vegetables and ripe fruits, with wine in moderation, brisk exercise, and strengthening bitters.

Where acrimony shews itself by itching eruptions, uncommon thirst, and flushing heats, nothing will answer better than such sulphureous waters as the Harrowgate and Moffat in Britain, or the Lucan and Swadlinbar in Ireland; at the same time using a course of diet that shall be neither acrid nor heating.

So far with respect to those kinds of morbid matter which do not invariably produce a particular species of disease: but there are others of a specific nature, some of which are generated in the body spontaneously, and seem to arise from errors in diet, or other circumstances of ill management with respect to the animal economy; and hence it is sometimes possible, in some degree, if not altogether, to prevent the ill consequences. Thus, there are instances where returns of the gout have been prevented by adhering strictly to a milk diet.

The rheumatism has also been sometimes warded off by wearing a flannel shirt, or by using the cold bath without interruption.

The stone may be retarded in its progress, and prevented from creating much distress, by the internal use of soap and lime-water, or by soap-lees taken in milk or in veal-broth.

The putrid scurvy may be prevented by warm cloathing and perseverance in brisk exercise, by drinking wine or cyder, and eating freely of such vegetable substances as can be had in those situations where this disease is most apt to shew itself.

In constitutions where there is an hereditary disposition to the scrophula, if early precautions be taken to strengthen the solids by cold bathing, a nourishing course of diet, and moderate use of wine, the acrimony which gives rise to the disease will probably be prevented from producing any very bad effects.

The other kinds of morbid matter, which are of the specific nature, are received into the body by infection or contagion.

The infection of a putrid fever or dysentery, is best



prevented by immediately taking an emetic on the first attack of the sickness or shivering; and if that does not completely answer, let a large blister be applied between the shoulders: by this method the nurses and other attendants on the sick in the naval hospitals have often been preserved.—As to other infectious morbid matter, see the HYDROPHOBIA, POISONS, &c.

The ill effects that may arise from the different species of *faburra* are to be obviated, in general, by the prudent administration of emetics, and carefully abstaining from such kinds of food as are known to cause the accumulation of noxious matters in the first passages.

Crude vegetables, milk, butter, and other oily substances, are to be avoided by persons troubled with a sourness in the stomach; brisk exercise, especially riding, is to be used, and they are to refrain from fermented liquors: the common drink should be pure water; or water with a very little of some ardent spirit, such as rum or brandy. Sellers and Valls water are to be drunk medicinally; and aromatic bitters, infusions, or tinctures, with the acid elixir of vitriol, from ten to twenty drops, will be found serviceable, in order to strengthen the fibres of the stomach, and promote the expulsion of its contents, thereby preventing the too hasty fermentation of the alimentary mixture. In order to procure immediate relief, the *magnesia alba*, or *Creta preparata*, will seldom fail; and the *magnesia*, as well as the other, may be made into lozenges, with a little sugar and mucilage; and in that form may be carried about and taken occasionally by people afflicted with the acid *faburra*.

In constitutions where there is an exuberance or flag-nation of bile, and a troublesome bitterness in the mouth, it is necessary to keep the bowels always free, by taking occasionally small doses of pure aloes, *oleum ricini*, cream of tartar, some of the common purging salts, or the natural purging waters.

When there is a tendency to the empyreumatic and rancid *faburra*, people should carefully avoid all the various kinds of those oily and high-seasoned things generally termed *made-dishes*, and eat sparingly of plain meat, without rich sauces or much gravy; and in these cases the properest drink is pure water.

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## II. RULES for those who enjoy perfect HEALTH.

THERE can be no doubt that, in general, temperance is the true foundation of health; and yet the ancient physicians, as we may see in the rules laid down by Celsus, did not scruple to recommend indulgence now and then, and allowed people to exceed both in eating and drinking: but it is safer to proceed to excess in drink than in meat; and if the debauch should create any extraordinary or distressing degree of pain or sickness, and a temporary fever should ensue, there are two ways of shaking it off, either to lie in bed and encourage perspiration, or to get on horse-back and by brisk exercise restore the body to its natural state. The choice of these two methods must always be determined by the peculiar circumstances of the parties concerned, and from the experience which they may have had which agrees best with them.

If a person should commit excess in eating, especially of high-seasoned things, with rich sauces, a draught of cold water, acidulated with spirit of vitriol,

will take off the sense of weight at the stomach, and assist digestion, by moderating and keeping within bounds the alimentary fermentation, and thus preventing the generation of too much flatus. The luxury of ices may be here of real service at the tables of the great, as producing similar effects with the cold water acidulated. Persons in these circumstances ought not to lay themselves down to sleep, but should keep up and exercise until they are sensible that the stomach is unladen, and that they no longer feel any oppressive weight about the præcordia.

If a man is obliged to fast, he ought, if possible, during the time, to avoid laborious work: after suffering severe hunger, people ought not at once to gorge and fill themselves; nor it is proper, after being overfilled, to enjoin an absolute fast: neither is it safe to rest totally immediately after excessive labour, nor suddenly fall hard to work after having been long without motion: in a word, all changes should be made by gentle degrees; for though the constitution of the human body be such that it can bear many alterations and irregularities without much danger, yet, when the transitions are extremely sudden, they cannot fail of producing some kind or degree of disorder.

It is also the advice of Celsus to vary the scenes of life, and not confine ourselves to any settled rules: but as inaction renders the body weak and listless, and exercise gives vigour and strength, people should never long omit riding, walking, or going abroad in a carriage; fencing, playing at tennis, or dancing, as each shall be found most agreeable or convenient, are to be used in their turns, according to the circumstances and tendency to any particular species of disease. But when the weakness of old age shall have rendered the body incapable of all these, then dry frictions with the flesh-brush will be extremely requisite to preserve health, by accelerating the flow of humours through the smallest orders of vessels, and preventing the fluids from stagnating too long in the cellular interstices of the fleshy parts.

Sleep is the great restorer of strength; for, during this time, the nutritious particles appear to be chiefly applied to repair the waste, and replace those that have been abraded and washed off by the labour and exercise of the day: but too much indulgence in sleep has many inconveniences, both with regard to body and mind, as it blunts the senses, and encourages the fluids to stagnate in the cellular systems; whence corpulency, and its necessary consequences languor and weakness.

The proper time for sleep is the night season, when darkness and silence naturally brings it on: therefore day-sleep in general is not so refreshing; and to some people is really distressful, as creating an unusual giddiness and languor, especially in persons addicted to literary pursuits. Custom, however, frequently renders sleep in the day necessary; and in those constitutions where it is found to give real refreshment, it ought to be indulged.

With regard to the general regimen of diet, it has always been held as a rule, that the softer and milder kinds of aliment are most proper for children and younger subjects; that grown persons should eat what is more substantial; and old people lessen their quantity of solid food, and increase that of their drink.

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Actions, corporeal, are considered by medical authors as voluntary, or such as are the effect of reason and will; spontaneous, or such as are the effect of instinct; and mixed, or those where it is difficult to say whether reason or instinct have the greatest share. All the actions of the human body are much influenced by changes in the state of the system itself, as has been seen in the preceding treatise; also by custom, &c. See the article CUSTOM and Habit.

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water, to separate the membrane which lines their inner

surface, and then powdering them by levigation. They

bind the belly the least of all the testaceous absorbents.

Eggs are nutritious, but if

hard boiled are difficultly digested. The yolk is used as

a medium for uniting balsams with water; but the white is

preferable, as it is less difficult for many stomachs.

Weak stomachs digest the white more easily than the yolk. Betwixt the serum of the blood and the white of egg there is great analogy.

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 Plate CLXXIV. fig. 5. Shows the *Inhaler* as constructed by Mr Mudge. *a*, The grating turned back, to shew the opening into the valve. \* The adjoining fig. is a section of the cover. *b*, The construction of the cork valve; *c*, the conical part into which the flexible tube *d* is fixed. The flexible part of the tube is about six inches long, and may be made by winding a long slip of silk oil-skin over a spiral brass wire.  
 Some little inconvenience is supposed to attend the use of this machine, as the empty part of the inhaler must contain part of the air which the person has already breathed. Mr Aitken furgeon in Edinburgh hath contrived the inhaler fig. 6. where this inconvenience is avoided. The machine is supplied with heated water at the screwed juncture of the flexible pipe marked A, which precludes the entrance of the air by a fold of soft leather interposed. The expired air is emitted by the corner of the mouth, as in smoking tobacco; so that there is no occasion for any other hole or valve in the machine.  
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N. B. ERRATA, OMISSIONS, &c. noticed and supplied in the APPENDIX at the end of the Work.















